seventh edition

Effective Teaching Methods

RESEARCH-BASED PRACTICE

Gary D. Borich
The University of Texas at Austin

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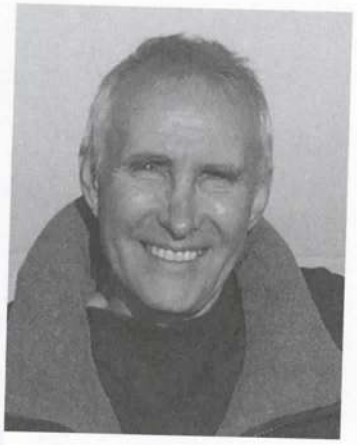
About the Author



Gary Borich grew up on the south side of Chicago, where he attended Mendel High School and later taught in the public school system of Niles, Illinois. He received his doctoral degree from Indiana University, where he was director of evaluation at the Institute for Child Study. Dr. Borich is a professor and a Cissy McDaniel Parker Endowed Fellow in the College of Education at the University of Texas at Austin and a past member of the board of examiners of the National Council for the Accreditation of Teacher Education (NCATE).

Dr. Borich's other books include *Observation Skills for Effective Teaching,* sixth edition; *Educational Assessment for the Elementary and Middle School Classroom,* second edition (with M. Tombari); *Clearly Outstanding: Making Each Day Count in Your Classroom; Becoming a Teacher: An Inquiring Dialogue for the Beginning Teacher; Educational Psychology: A Contemporary Approach,* second edition (with M. Tombari); *Educational Testing and Measurement,* ninth edition (with T. Kubiszyn); and *The Appraisal of Teaching: Concepts and Process.*

Dr. Borich lives in Austin, Texas, with his wife, Kathy, and his children, Brandy and Damon. His interests include training and riding Arabian horses and he is the author of *An Illustrated Introduction to Classical Horsemanship.*

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PREFACE

State curriculum standards and testing, differentiated instruction, new communication technologies for lesson planning, special populations in the general education classroom, new teacher certification requirements, and assessment are but a few of the factors that continue to change the face of American schools. This book has been written to help you prepare to meet these challenges and to discover the opportunities for professional growth and advancement they provide.

This seventh edition of *Effective Teaching Methods* continues to strengthen the four goals of previous editions. The first goal is to present effective teaching practices derived from nearly four decades of classroom research. In this research, different teaching practices were systematically studied for their effectiveness on learners. The results have made it possible to replace many age-old anecdotal suggestions for good teaching with modern-day research-based teaching practices that are empirically related to positive outcomes in learners. Describing these teaching practices and how to use them to become an effective teacher is a major focus of this book.

Second, this text describes these effective teaching practices in a friendly, conversational manner. The language of classrooms is informal, and there is no reason a book about teachers in classrooms should not use the same language. Therefore, this book talks straight, avoiding complicated prescriptions, rambling discussions, or pseudo-scholarly language. The intent is to get the point across quickly and in a user-friendly style so that you can immediately apply it in the classroom.

The third goal of this book is to be practical. Positive prescriptions for your classroom teaching show you how to engage students in the learning process, manage your classroom, and increase student achievement. This book not only tells you what to do to obtain these results, it also shows you how to obtain them with extensive examples from classroom videos, written classroom dialogues, and case studies.

The final goal of this book is to be realistic. Some of the literature on effective teaching is theoretical and speculative. This book, in contrast, describes what the research says real teachers do in real classrooms to be effective, identifying which teaching practices they have found to be effective. Nothing in this book is pie-in-the-sky theorizing about effective teaching, because most of what is presented results directly from years of research and observation of effective teaching practices in actual classrooms.

These, then, are this book's four goals: to provide effective, research-based teaching practices, presented in a conversational style, that are practical and realistic in today's heterogeneous classrooms.

NEW TO THIS EDITION

Users of earlier editions of *Effective Teaching Methods* will notice that each chapter has been revised. The rapid pace of change and new research occurring in nearly every aspect of teaching has resulted in a seventh edition that considerably updates and extends earlier editions and provides an extensive complement of features to get beginning teachers confident and up to speed on their very first day of classroom observation and practice teaching.

- MyEducationLab callouts within each chapter connect you with activities and materials online at MyEducationLab for General Teaching Methods (www.myeducationlab.com). Through authentic in-class video footage and other practice activities, MyEducationLab prepares you for a career in teaching by showing what quality instruction looks like.
- Updated In Practice features in every chapter demonstrate how chapter concepts can work in the real world of the classroom.
- Coverage of students with special needs, differentiated instruction, and research on socioeconomic status and culture has been expanded to include the responsibilities of the regular classroom teacher in responding to the requirements of No Child Left Behind and the Individuals with Disabilities Education Improvement (2004) legislation for teaching and assessing learners with special needs.
- Chapter 12 has been updated and expanded as it looks at the treatment of high-stakes testing, diagnostic assessment, and progress monitoring, including what you will need to know to assess the learners with special needs in your classroom. The chapter explores what's right and what's wrong about standardized tests, their proper use and potential for abuse, and how you can help all your students perform better on them.
- Chapter 3 has been revised to make clear the important relationship between state standards and your classroom goals and objectives.
- Revised Chapter 4 on unit and lesson planning provides some of the tools you can use to differentiate your instruction in a heterogeneous classroom, including coverage of technology integration.
- Chapters 5 and 6 on classroom management have been updated with the latest research and best practices in this area, including anticipatory classroom management and how to build a cohesive classroom of learners who work in harmony.
- Students will find sections on culturally responsive teaching updated with the latest research on this important topic.

SPECIAL FEATURES OF THIS TEXT

Features that can be found in the seventh edition include:

- Chapter opening questions and INTASC standards correlations focus you on the key aspects of each chapter.
- MyEducationLab Video Window features introduce readers to an authentic classroom-based MyEducationLab online video segment, creating a convenient classroom observation opportunity. Readers are encouraged to explore, analyze, and respond to the video-based classroom instruction through the assignable questions and prompts built around each video. Additionally, MyEducationLab margin notes, located throughout the text, direct readers to Building Teaching Skills and Dispositions learning units and a quality Study Plan for each chapter, providing a rich set of opportunities to practice understanding of core concepts and course content.
- Updated In Practice features offer practical teaching tips, strategies, and techniques that can help new teachers extend their textbook knowledge to their very first lesson plans, showing them tangible approaches to putting theory into practice and offering practical tips, strategies, and techniques. They include how to apply constructivist principles, use differentiated instruction, teach learners with special needs in a heterogeneous classroom, apply the concept of multiple intelligences, write interdisciplinary unit plans, achieve mastery learning, initiate project- and problem-based

learning, and use portfolios and performance assessments to provide learners an opportunity to participate in their own assessment.

- Case History and Licensure Preparation features at the end of each chapter refer you to MyEducationLab to complete related questions that come with hints and feedback. Following the objectives, format, and content of the *Praxis II®: Principles of Learning and Teaching* exam, these case histories and practice assessment questions provide an updated and in-depth targeted rehearsal that will help prepare you for the test-taking skills and pedagogical knowledge that may be expected of you on exit exams from your teacher preparation program and for certification and licensing.
- End-of-chapter Summing Up sections restate key concepts in an easy-to-follow outline format for easy reference during field experiences, observation assignments, and practice teaching.
- End-of-chapter Discussion and Practice Questions review the most important content of each chapter, with keyed answers presented in Appendix B.
- Three complementary sets of activities in the new Professional Practice section at the ends of chapters provide hands-on opportunities to engage you in decision making and problem solving as they are carried out in a real classroom. Together, all three sets of activities provide a menu of opportunities from which you can practice and advance the skills learned in each chapter.
  - Field Experience and Practice Activities encourage you to make decisions and solve practical classroom problems related to the content within each chapter with regard to lesson planning, classroom management, cultural diversity, and project-based learning.
  - Digital Portfolio Activities guide you in creating a professional portfolio of accomplishments with entries related to the content of each chapter. This portfolio will be a vehicle with which you can put your best foot forward to future instructors in your teacher preparation program, cooperating or supervisory teachers during student teaching, professional colleagues, and, most importantly, future employers. The portfolio will chronicle your best accomplishments in this course and beyond.
  - Classroom Observation Activities can be completed either from classroom videos provided with this text or from those available from your teacher preparation program. You will also have opportunities to visit classrooms as part of this and other courses in your teacher preparation program. These observation activities are practiced in this text to give you the skills and confidence you will need to complete the observation requirements required in your teacher preparation curriculum.
- A self-report survey instrument is included in Chapter 1 and Appendix A for measuring the concerns you have about yourself as a teacher, concerns about the teaching task, and concerns about your impact on students, which can be used to chart your growth and development as a teacher over time.
- A practical visual format is included in Chapter 4 for organizing your unit and lesson plans, letting you graphically visualize the relationship between lessons and units and better prepare for meeting state standards and preparing your learners for their standardized assessments.
- A Higher-Order Thinking and Problem-Solving Checklist is included in Chapters 3, 10, 12, and Appendix C to help you achieve a curriculum in your classroom that encourages your students to problem solve, make decisions, and think critically.
- A glossary of key terms and definitions recaps all of the major definitions, concepts, and teaching practices that you will need to review for the Praxis exams and your state's certification requirements.

How This Book Is Organized

- Chapter 1 introduces the characteristics of an effective teacher and what an effective teacher does in the classroom. This chapter also acquaints you with the NBPTS and INTASC standards that will be important for your certification and licensing.
- Chapter 2 provides a discussion on understanding adaptive teaching, differentiated instruction, and how individual differences and learner diversity (prior achievement, learning style, culture and language, and home and family life) affect student learning needs and classroom management. This chapter will introduce you to the real nature and challenges of today's multicultural, heterogeneous classrooms and the teaching of English-language learners, immigrant populations, at-risk learners, and special-needs learners, including how to close the achievement gap among students of different socioeconomic levels.
- Chapter 3 on goals, standards, and objectives shows you how to assess the extent to which you are achieving knowledge, thinking, and problem-solving behaviors in your classroom. This chapter expands the traditional taxonomies of cognitive and affective behavior to include the important higher-order objectives of metacognition, problem solving, decision making, critical thinking, and valuing. It also makes clear the important relationship between state standards and your classroom goals and objectives.
- Chapter 4 on unit and lesson planning will improve your skills in linking subject-matter content to teaching methods and student outcomes in a continuous process of lesson planning. The chapter shows you how to compose thematic and interdisciplinary lessons to promote higher-order thought processes and problem-solving behavior in your learners. It also provides some of the tools you can use to differentiate your instruction in a heterogeneous classroom.
- Chapters 5 and 6 delve into classroom management and provide a complement of techniques and strategies that can quickly change your beginning days in the classroom from a concern for your own survival to a concern for the impact you are having on your learners.
- Chapters 7 and 8 provide you with an interchangeable menu of instructional activities that can be mixed and matched to the needs of your learners and objectives of your lesson to help you better implement the goals of differentiating instruction in a heterogeneous classroom. Chapter 7 offers teaching strategies that explain how to use direct instructional methods (such as explaining, presenting, drill and practice, and recitation), while Chapter 8 explores indirect instructional methods (such as group discussion, concept-learning, inquiry, and problem-solving activities).
- Chapter 9 on teacher questioning shows you how to raise questions at different levels of cognitive complexity and how to use probes and follow-up questions to promote higher-order thinking and problem-solving behavior. This chapter will help you ask questions that prepare your learners not only to engage in quick, firm, and correct responses during direct instruction but also to ask and respond to higher-order questions during indirect instruction.
- Chapter 10 focuses on self-directed learning and how to use metacognitive techniques, teacher mediation, and the social dialogue of the classroom to help learners control, regulate, and take responsibility for their own learning. You will learn to unleash your learners' intuitive and imaginative capacities to learn on their own, with you as a resource, leaving them with a sense of ownership in what they have explored and discovered. This chapter offers specific tools and techniques that effective teachers use to get their students to become agents of their own learning.

- Chapter 11 discusses cooperative learning and the collaborative process for productively organizing and managing group and team activities to promote communication skills, self-esteem, and problem solving. It will introduce you to the enthusiasm, motivation, and creativity that can result from learners working together on real-world projects and performances and how to teach your students the democratic and collaborative skills they will need in and beyond your classroom.
- Chapter 12 offers an updated and expanded treatment of standardized tests that includes what you will need to know to assess the learners with special needs in your classroom. No other development in education during the last decade has generated more controversy than the use of standardized tests for making high-stakes decisions involving grade promotion, the selection of students for advanced academic programs, high school graduation, and assessing special populations, as called for by recently authorized and updated federal legislation. The chapter explores the assessment of student achievement and interpreting student progress using teacher-made objective tests, essays, performance assessments, and portfolios. This chapter will not only help you assess the day-to-day understanding of *all* learners, but it will help you bridge the gap between your learners' daily performance and their standardized test results.

MyEducationLab

"Teacher educators who are developing pedagogies for the analysis of teaching and learning contend that analyzing teaching artifacts has three advantages: it enables new teachers time for reflection while still using the real materials of practice; it provides new teachers with experience thinking about and approaching the complexity of the classroom; and in some cases, it can help new teachers and teacher educators develop a shared understanding and common language about teaching."*

As Linda Darling-Hammond and her colleagues point out, grounding teacher education in real classrooms—among real teachers and students and among actual examples of students' and teachers' work—is an important, and perhaps even an essential, part of training teachers for the complexities of teaching in today's classrooms. For this reason, we have created a valuable time-saving website—MyEducationLab—that provides you with the context of real classrooms and artifacts that research on teacher education tells us is so important. The authentic in-class video footage, interactive exercises, and other resources available on MyEducationLab offer you a uniquely valuable teacher education tool.

MyEducationLab is easy to use and integrate into both your assignments and your courses. Wherever you see the MyEducationLab logo in the margins or elsewhere in the text, follow the simple instructions to access the videos, strategies, cases, and artifacts associated with these assignments, activities, and learning units on MyEducationLab. MyEducationLab is organized topically to enhance the coverage of the core concepts discussed in the chapters of your book. For each topic on the course you will find most or all of the following resources:

- *Connection to National Standards.* Now it is easier than ever to see how your coursework is connected to national standards. In each chapter of MyEducationLab you will find intended learning outcomes connected to the appropriate national standards for

*Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teachers for a changing world.* San Francisco: John Wiley & Sons.

your course. All of the Assignments and Activities in MyEducationLab are mapped to the appropriate national standards and learning outcomes as well.

- *Assignments and Activities.* Designed to save instructors preparation time, these assignable exercises show concepts in action (through video, cases, or student and teacher artifacts) and then offer thought-provoking questions that probe your understanding of these concepts or strategies. (Feedback for these assignments is available to the instructor.)
- *Building Teaching Skills and Dispositions.* These learning units help you practice and strengthen skills that are essential to quality teaching. First you are presented with the core skill or concept, and then you are given an opportunity to practice your understanding of this concept multiple times by watching video footage (or interacting with other media) and critically analyzing the strategy or skill presented.
- *IRIS Center Resources.* The IRIS Center at Vanderbilt University (http://iris.peabody.vanderbilt.edu), funded by the U.S. Department of Education's Office of Special Education Programs (OSEP), develops training enhancement materials for preservice and in-service teachers. The Center works with experts from across the country to create challenge-based interactive modules, case study units, and podcasts that provide research-validated information about working with students in inclusive settings. We have integrated this content on your MyEducationLab course, where appropriate, to enhance the content coverage in your book.
- *Teacher Talk.* This feature links to videos of teachers of the year across the country discussing their personal stories of why they teach. This National Teacher of the Year Program is sponsored by the Council of Chief State School Officers (CCSSO) and focuses public attention on teaching excellence.

General Resources on Your MyEducationLab Course

The Resources section on your MyEducationLab course is designed to help you pass your licensure exam, put together an effective portfolio and lesson plan, prepare for and navigate the first year of your teaching career, and understand key educational standards, policies, and laws. This section includes:

- *Licensure Exams.* Access guidelines for passing the Praxis exam. The Practice Test Exam includes practice questions, Case Histories, and Video Case Studies.
- *Portfolio Builder and Lesson Plan Builder.* Create, update, and share portfolios and lesson plans.
- *Preparing a Portfolio.* Access guidelines for creating a high-quality teaching portfolio that will allow you to practice effective lesson planning.
- *Licensure and Standards.* Link to state licensure standards and national standards.
- *Beginning Your Career.* Educate yourself—access tips, advice, and valuable information on:
  - *Resumé Writing and Interviewing.* Expert advice on how to write impressive resumés and prepare for job interviews.
  - *Your First Year of Teaching.* Practical tips to set up your classroom, manage student behavior, and learn to more easily organize for instruction and assessment.
  - *Law and Public Policies.* Specific directives and requirements you need to understand under the No Child Left Behind Act and the Individuals with Disabilities Education Improvement Act of 2004.
- *Special Education Interactive Timeline.* Build your own detailed timelines based on different facets of the history and evolution of special education.

Book-Specific Resources

Study Plan. A MyEducationLab Study Plan is a multiple-choice assessment tied to chapter objectives and supported by study material. A well-designed Study Plan offers multiple opportunities to fully master required course content as identified by the objectives in each chapter:

- *Chapter Objectives* identify the learning outcomes for the chapter and give you targets to shoot for as you read and study.
- *Multiple-Choice Assessments* assess mastery of the content (tied to each chapter objective) by allowing you to take the multiple-choice quiz as many times as needed. Not only do these quizzes provide overall scores for each objective, but they also explain why responses to particular items are correct or incorrect.
- *Study Material: Review, Practice, and Enrichment* gives you a deeper understanding of what you do and do not know related to chapter content. This can be accessed through the Multiple-Choice Assessment (after each quiz, you will receive information regarding the chapter content on which you need further practice and review) or through a self-directed method of study. This material includes text excerpts, activities that include hints and feedback, and media assets (video, simulations, cases, etc.).

Case History and Licensure Preparation. The practice assessment questions related to the case history presented in each chapter have been modeled on Praxis questions and designed to prepare you for your licensure exams. You will receive feedback on these questions when you submit your answers.

Classroom Observation Tools. Instruments and forms from this book, as well as the author's *Observation Skills for Effective Teaching*, Sixth Edition, provide templates to download and print for observation practicum, student teaching, and classroom use.

Visit www.myeducationlab.com for a demonstration of this exciting new online teaching resource.

INSTRUCTOR SUPPLEMENTS

The text provides the following ancillary materials to assist instructors in planning their course and use of this textbook to maximize learning. These instructor supplements are available for download from the password-protected Instructor Resource Center at www.pearsonhighered.com. Please contact your local Pearson representative if you need assistance obtaining the supplements.

Instructor's Resource Manual and Test Bank

Each chapter of the Instructor's Resource Manual includes a chapter overview, student learning objectives, INTASC standards correlation, list of features, list of chapter-related student self-assessments and Assignments and Activities on MyEducationLab, detailed overviews and instructional activities to complete in the college classroom or in the field for each major section of the chapter, and a print version of the computerized test bank, including short-answer and essay questions.

MyTest

Pearson MyTest is a powerful assessment generation program that helps instructors easily create and print quizzes and exams. Questions and tests are authored online, allowing ultimate flexibility and the ability to efficiently create and print assessments anytime, anywhere! Instructors can access Pearson MyTest and their test bank files by going to www.pearsonmytest.com to log in, register, or request access. Features of Pearson MyTest include:

Premium Assessment Content

- Draw from a rich library of assessments that complement your Pearson textbook and your course's learning objectives.
- Edit questions or tests to fit your specific teaching needs.

Instructor-Friendly Resources

- Easily create and store your own questions, including images, diagrams, and charts, by using simple drag-and-drop and Word-like controls.
- Use additional information provided by Pearson, such as the question's difficulty level or learning objective, to help you quickly build your test.

Time-Saving Enhancements

- Add headers or footers and easily scramble questions and answer choices—all from one simple toolbar.
- Quickly create multiple versions of your test or answer key, and when ready, simply save to MS Word or PDF format and print!
- Export your exams for import to Blackboard 6.0, CE (WebCT), or Vista (WebCT)!

PowerPoint™ Presentations

Ideal for lecture presentations or student handouts, the PowerPoint™ presentation for each chapter includes key concept summaries.

Additional Resources

The companion volume to this text, *Observation Skills for Effective Teaching,* Sixth Edition (also from Pearson Education), is intended to be used either in a preteaching observation experience or as an applications resource to the present volume. *Observation Skills for Effective Teaching* provides extensive examples, entertaining and instructional classroom dialogues, and practical observation and recording instruments keyed to and coordinated with the effective teaching methods presented in this text. Together, these texts provide a sequence of learning for the preservice and beginning teacher.

Acknowledgments

Many individuals contributed to the preparation of this book. Not the least significant are the many professionals whose studies of classroom life have contributed to the effective teachers described in this text.

A special thank you to those educators who gave their time to review the text and guide this revision: Maria Grant, California State University-Fullerton; Mary F. Leslie, Louisiana State University at Eunice; and Leslie J. Zorko, University of Wyoming.

I also wish to acknowledge those teachers who over the years have shared their insights about the teaching process with me. Among them have been teachers in the Austin, Texas, Independent School District—especially William B. Travis High School and Travis Heights Elementary School, who provided the opportunity to observe many of the effective teaching methods described herein. For their helpful reviews and contributions to the manuscript, I extend my gratitude to my good friends and colleagues Marty Tombari and Tom Kubiszyn.

GDB
Austin, Texas

1

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. What is an effective teacher?
2. How can I become an effective teacher?
3. Are there different definitions of effective teaching?
4. What are some of the teaching practices used by effective teachers?
5. How will I know if I am an effective teacher?

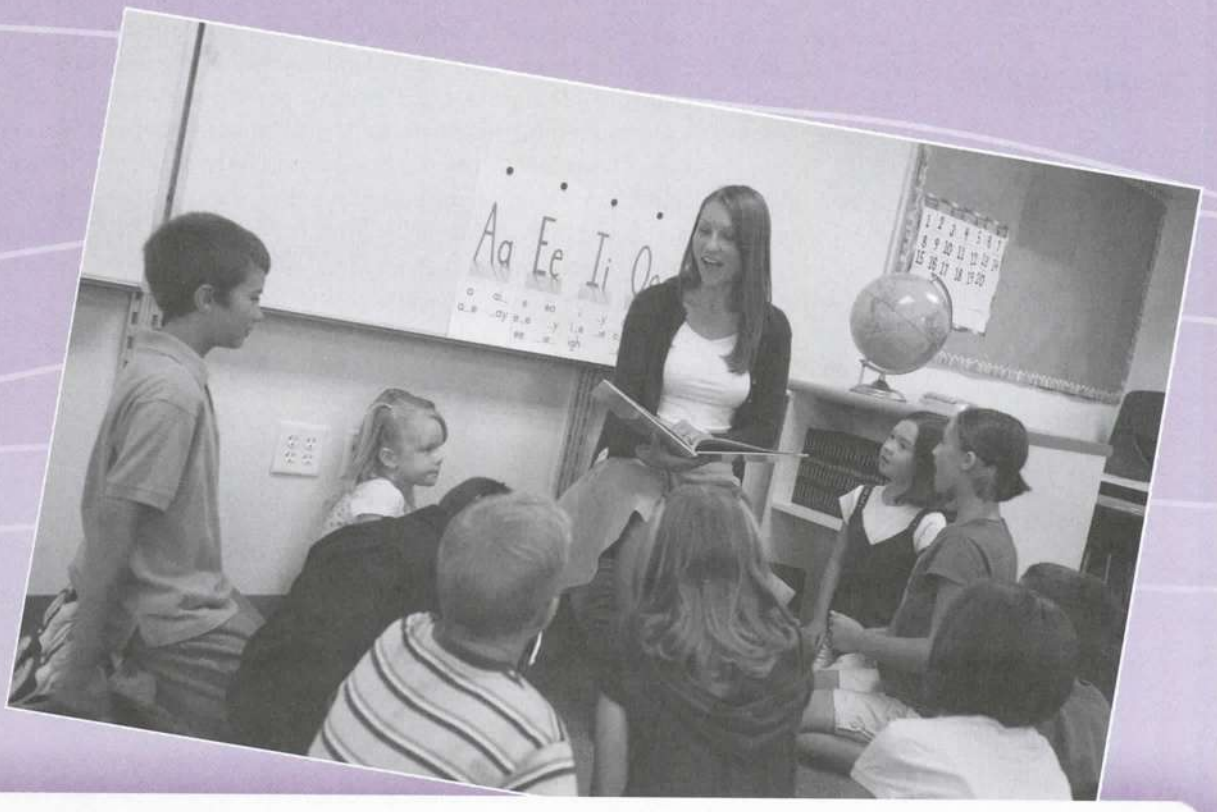
INTASC

principle 1 The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students.

principle 3 The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.

principle 4 The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.

The Effective Teacher



How easily or quickly could you answer the question, What is an effective teacher? This question has been asked by every teacher, young and old. It is a deceptively simple question, for it has many different answers. Teaching is a complex and difficult task that demands extraordinary abilities. After decades of experience and research, one of the most important questions in education today still is, What is an effective teacher?

This chapter offers no pat definitions of an effective teacher. Instead, the goal is to introduce you to practices used by effective teachers that are related to positive outcomes in learners. These effective teaching practices do not tell the whole story of what an effective teacher is, but they do form an important foundation to help you become an effective teacher and profit from reading the chapters ahead. Subsequent chapters blend these practices with lesson planning, problem-based learning, questioning strategies, classroom management, learner assessment, and the attitudes and dispositions you will need to build a warm and nurturing relationship with your students. These topics will give you a rich and comprehensive picture of an effective teacher and, most importantly, help you become one.

WHAT IS AN EFFECTIVE TEACHER?

The Role Model Definition

If you had grown up a century ago, you would have been able to answer the question of What is an effective teacher? very simply: A good teacher is a good person—a role model who meets the community ideal for a good citizen, good parent, and good employee. At that time, teachers were judged primarily on their goodness as people and only secondarily on their behavior in the classroom. They were expected to be honest, hardworking, generous, friendly, and considerate and to demonstrate these qualities in their classrooms by being organized, disciplined, insightful, and committed. Practically speaking, this meant that to be effective, all a beginning teacher needed was King Solomon's wisdom, Sigmund Freud's insight, Albert Einstein's knowledge, and Florence Nightingale's dedication!

It soon became evident that this definition of an ideal teacher lacked clear, objective standards of performance that could be consistently applied and that could be used to train future teachers.

The Psychological Characteristics Definition

The early "role model" definition of an effective teacher soon gave way to another definition, which attempted to identify the psychological characteristics of a good teacher, including a teacher's personality, attitude, experience, aptitude, and past achievement. Table 1.1 lists some of these psychological characteristics. Because they have a certain intuitive appeal, it is worth noting why they have not been useful criteria for defining a good teacher.

Personality. Over the years, only a few personality measures have been developed that relate specifically to teaching. Because most personality measures have been designed to record behavior in clinical settings, much of what they measure has been of little help in identifying the positive behaviors that may be needed to be an effective teacher. Consequently, the usefulness of many personality tests in predicting a teacher's classroom behavior must be inferred from their more general success in the field of mental health.

Although certain interpersonal, emotional, and coping behaviors are believed to be required for effective teaching (Levis, 1987; National Mental Health Information Center, 2005), personality tests have provided few insights into the positive social behaviors that may be needed for effective teaching. As any experienced teacher will tell you, however, much of your success in teaching will depend on your skills in building a cohesive learning culture in your classroom, for which your attitude toward and relationship with your learners provide an essential foundation.

Attitude. Attitude assessments may be either global (for example, attitude toward the educational system and the teaching profession) or specific (for example, attitude toward a particular teaching task, type of learner, or curriculum). But most attempts to measure teacher attitude have failed to forecast what a teacher who has a particular attitude actually does differently in the classroom and, more importantly, how that teacher relates to individual learners. Research has shown little correspondence between a teacher's attitude toward the tools of learning (for example, curriculum, instructional technology, and teaching methods) and his or her interactions in the classroom that motivate students to learn (Jackson, 1968; Walberg, 1986).

Therefore, the use of attitude data for measuring teacher effectiveness has had to rest on the assumption that attitudes are related to activities that are one or more steps removed from the actual teaching process, such as preparing more organized lesson plans

Table 1.1 Commonly Studied Teacher Characteristics

Personality	Attitude	Experience	Aptitude/Achievement
Permissiveness	Motivation to teach	Years of teaching experience	National Teachers Exam
Dogmatism	Attitude toward children	Experience in subject taught	Graduate Record Exam
Authoritarianism	Attitude toward teaching	Experience in grade level taught	Scholastic Aptitude Test:
Achievement–motivation	Attitude toward authority	Workshops attended	1. Verbal
Introversion–extroversion	Vocational interest	Graduate courses taken	2. Quantitative
Abstractness–concreteness	Attitude toward self (self-concept)	Degrees held	Special ability tests (e.g., reasoning ability, logical ability, verbal fluency)
Directness–indirectness	Attitude toward subject taught	Professional papers written	Grade-point average:
Locus of control			1. Overall
Anxiety:			2. In major subject
1. General			Professional recommendations
2. Teaching			Student evaluations of teaching effectiveness
			Student teaching evaluations

or having better subject-matter preparation (Clark & Peterson, 1986; Kagan & Tippins, 1992; Muijs & Reynolds, 2005). However, measuring a teacher's attitude to provide an index of effective teaching would always be less credible than observing actual classroom practices that involve the relationship of the teacher with learners.

Experience. You probably, at one time or another, provided biographical data about yourself when applying for a job. You may have found that a listing of your general qualifications—such as years of experience, credits earned, and degrees granted—defined your experience so broadly as not to be very predictive of what you could do on that specific job.

Such descriptions typically do not describe experience relevant to performing the day-to-day tasks required in a specific context, such as classroom, grade level, or subject matter. A teacher's experience with a specific grade level, curriculum, and type of learner, if available, has been more predictive of actual classroom performance than general biographical information, which may represent only a small portion of a teacher's qualifications for a particular teaching assignment (Goldhaber & Anthony, 2003).

Aptitude and Achievement. Like general experience, most aptitude and achievement data do not accurately predict classroom performance. Regardless of the fact that these measures often are used to predict student performance, a teacher's recorded school achievement seldom has correlated strongly with classroom performance—and here is why.

As an example of recorded achievement, consider a teacher's college grade-point average (GPA). Achieving good grades might indicate enthusiasm for teaching and a promise of good classroom performance. But standards set by training institutions require teachers to meet minimum levels of competence for certification. This usually results in small variations in grades among beginning teachers that are not very predictive of actual practice in the classroom. Licensure and exit tests that examine teachers over specific teaching behaviors and curriculum-specific knowledge, such as the **Praxis™*** Series: Professional Assessments for Beginning Teachers (www.ets.org/praxis), tend to be better

*Boldfaced terms appear in the Glossary at the end of this text.

predictors of classroom performance than measures of general achievement or aptitude (see Figure 1.1). For this reason, example case histories are provided at the end of each chapter in this text. Constructed-response and multiple-choice questions for licensure based on each case history can be completed on MyEducationLab.

Figure 1.1 About the Praxis

The Praxis™ Series: Professional Assessments for Beginning Teachers is a set of validated assessments that provide information to colleges, state education agencies, and school districts for graduation, licensing, and hiring decisions. In addition, colleges and universities may use the basic academic skills component of the Praxis Series to qualify individuals for entry into teacher education programs.

The three areas of assessment in the Praxis Series are as follows:

1. For entering a teacher training program: Praxis I: Academic Skills Assessments
2. For licensure into the teaching profession: Praxis II: Subject and Pedagogy Assessments
3. For the first year of teaching: Praxis III: Classroom Performance Assessments

The Praxis II: Subject and Pedagogy test contains two types of assessments:

Praxis II: Principles of Learning and Teaching

Praxis II: Multiple Subjects Assessments

The Praxis II®: Principles of Learning and Teaching Assessments are designed to assess pedagogical knowledge at the end of your undergraduate teacher preparation program in such areas as educational psychology, human growth and development, classroom management, instructional design and delivery techniques, and evaluation and assessment. The assessments are divided into Early Childhood, grades K–6, grades 5–9 and grades 7–12 to reflect areas of certification. Students at the end of their teacher preparation program usually take one of the three tests, which are of 2 hours' duration. Each assessment includes four case histories each followed by short-answer questions related to the case history scored on a scale of 0 to 2 by two or more raters using question-specific scoring guides and model answers. This section is followed by 24 multiple-choice questions in two sections of 12 items each that assess the student's general knowledge in the following areas, some of which may require the reading and analysis of passages pertaining to pedagogical content:

Students as Learners

- Student development and the learning process
- Students as diverse learners
- Student motivation and the learning environment

Communication Techniques

- Basic, effective verbal and nonverbal communication techniques
- Effects of cultural and gender differences on classroom communications
- Types of communications and interactions that can stimulate discussion in different ways for particular purposes

Instructional Strategies

- Instructional strategies
- Planning instruction
- Assessment strategies

Profession and Community

- The reflective practitioner
- The larger community

The Praxis II: Multiple Subjects Assessments include specialty area tests in over 100 subject areas in grades K–12 designed to assess content knowledge at the end of your teacher preparation program in the areas for which you are being trained and licensed to teach. The number and content of the tests taken are indicated by the subject areas and/or grade levels for which you wish to receive certification. Although formats vary among tests, most of the tests are from 1 to 2 hours in duration and include a combination of short-answer essay questions based on a specific teaching situation or passage and/or multiple-choice questions. Some typical content tests are Early Childhood Education; Biology; Physics; Business Education; General Science, English Language, Literature and Composition; Physical Education; Social Studies; and Art.

Visit www.ets.org for more information.

To summarize, using general information about a teacher's personality, attitude, experience, achievement, and aptitude to define a good teacher represented early attempts to predict a teacher's classroom behavior objectively. But these characteristics often were too remote from the teacher's day-to-day work in the classroom to contribute meaningfully to the definition of an effective teacher. Most notably, these definitions excluded the most important measure of all for determining good teaching: the interaction of the teacher and learners and the performance of the students being taught.

A New Direction

Over the past several decades, a revolution has occurred in defining good teaching. We have seen that defining good teachers by community ideals proved unrealistic. We also have seen how teachers' psychological characteristics proved to be poorly related to what teachers actually do in the classroom. This directed researchers to study the impact of specific teacher activities on the specific cognitive and affective behaviors of their students. The term *good teaching* changed to *effective teaching,* and the research focus shifted from studying teachers exclusively to including teachers' effects on students. These new ways of studying classroom behavior have made the student and teacher-student relationship in the classroom the focus of modern definitions of effective teaching.

Linking Teacher Behavior with Student Performance. During the past few decades, researchers developed new methods for studying the classroom interaction patterns of teachers and students. Their goal was to discover which patterns of teacher behavior promote desirable student performance. But before unveiling the findings of this research and their implications for effective teaching, let's see how this research was performed.

The Research Process. To collect data on the classroom interaction patterns of teachers and students, researchers often used instruments like those shown in Figures 1.2 to 1.4. These particular instruments, devised by Good and Brophy (2007) for their research on effective teaching, record patterns of student-teacher interaction. Using the response form in Figure 1.3 and Figure 1.2 as a guide, an observer codes both student responses to questions and the teacher's reaction and feedback. For example, in the tenth interchange recorded on this form, a male student fails to answer a question (coded 0 under "Student Response"), is criticized by the teacher for not answering ("--"), and then is given the answer by the teacher ("Gives Ans."). Numbers for the interchanges are assigned as they occur, allowing the pattern of question-answer-feedback to be recorded over an entire class period across many classrooms.

In Figure 1.4, the observer codes the student performance being praised by the teacher (Perseverance, Progress, Success, Good thinking, etc.). Individual students are identified by assigning each a unique number. This form records not only the praise behavior of the teacher in relation to individual student behavior but also the overall pattern or sequence of action. For example, student 8 is praised three times in a row for "Perseverance or effort."

With instruments such as these, a rich and varied picture of classroom activity can be captured over the course of a research study and related to various measures of school achievement. Obviously, a single observations of a single class will produce too little data to reveal a consistent pattern of interaction. However, multiple observations extending across different teachers, schools, and school districts can reveal consistent patterns of teacher-student interactions. These patterns of classroom behavior then can be related to student outcomes—such as classroom tests, student projects, oral performances, portfolio assessments, and standardized tests—to determine their effects on student performance.

It was in this manner that patterns of effective teaching began to emerge in studies conducted by different researchers. As in all research, some studies provided contradictory results or found no relationships among certain types of classroom interactions and student outcomes. But many studies found patterns of interaction that consistently

Figure 1.2 Coding Categories for Question–Answer–Feedback Sequences

Symbol	Label	Definition
Student Sex		
M	Male	The student answering the question is male.
F	Female	The student answering the question is female.
Student Response		
+	Right	The teacher accepts the student's response as correct or satisfactory.
±	Part right	The teacher considers the student's response to be only partially correct or to be correct but incomplete.
–	Wrong	The teacher considers the student's response to be incorrect.
0	No answer	The student makes no response or says he doesn't know (code student's answer here if teacher gives feedback reaction before he is able to respond).
Teacher Feedback Reaction		
++	Praise	Teacher praises student either in words ("fine," "good," "wonderful," "good thinking") or by expressing verbal affirmation in a notably warm, joyous, or excited manner.
+	Affirm	Teacher simply affirms that the student's response is correct (nods, repeats answer, says "Yes," "OK," etc.).
0	No reaction	Teacher makes no response whatever to student's response—he or she simply goes on to something else.
–	Negate	Teacher simply indicates that the student's response is incorrect (shakes head, says "No," "That's not right," "Hm-mm," etc.).
––	Criticize	Teacher criticizes student, either in words ("You should know better than that," "That doesn't make any sense—you better pay close attention," etc.) or by expressing verbal negation in a frustrated, angry, or disgusted manner.
Gives Ans.	Teacher gives answer	Teacher provides the correct answer for the student.
Ask Other	Teacher asks another student	Teacher redirects the question, asking a different student another student to try to answer it.
Other Calls	Another student calls out answer	Another student calls out the correct answer, and the teacher answer acknowledges that it is correct.
Repeat	Repeats question	Teacher repeats the original question, either in its entirety or with a prompt ("Well?" "Do you know?" "What's the answer?").
Clue	Rephrase or clue	Teacher makes original question easier for student to answer by rephrasing it or by giving a clue.
New Ques.	New question	Teacher asks a new question (i.e., a question that calls for a different answer than the original question called for).

Source: From Thomas L. Good and Jere E. Brophy, *Looking in Classrooms*, 5/e. Published by Allyn and Bacon, Boston, MA.

produced desirable student outcomes in the form of higher test scores, increased problem solving, and improved learning skills.

Now that you know how the research was conducted, let's look at a preview of the teaching strategies and methods that researchers generally agree contribute to effective teaching and that will be addressed in the following chapters.

Figure 1.3 Coding Response Form

	Sex		Student Response				Teacher Feedback Reaction										
Stu. No.	M	F	+	±	–	0	++	+	0	–	– –	Gives Ans.	Ask Other	Other Calls	Repeat	Clue	New Ques.
1		✓	✓					✓									
2	✓		✓					✓									
3	✓					✓										✓	
4	✓		✓				✓										
5	✓		✓					✓									
6		✓			✓						✓						✓
7	✓		✓				✓										
8	✓		✓						✓								
9	✓		✓						✓								
10											✓	✓					
11																	
12																	
13																	
14																	
15																	

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KEY BEHAVIORS CONTRIBUTING TO EFFECTIVE TEACHING

From this research, approximately 10 teacher behaviors have been identified that show promising relationships to desirable student performance, primarily as measured by classroom assessments and standardized tests. Five of these behaviors have been consistently supported by research studies over the past three decades (Borich, 2008a; Brophy, 2002; Brophy & Good, 1986; Cantrell, 1998/1999; Dunkin & Biddle, 1974; Marzano, Pickering, & Pollock, 2004; McNary, Glasgow, & Hicks, 2005; Rosenshine, 1971; Saunders, 2005; Taylor, Pearson, Clark, & Walpole, 1999; Teddlie & Stringfield, 1993; Walberg, 1986; Willis, 2006). Another five have had some support and appear logically related to effective teaching. The first five are called **key behaviors,** because they are considered essential for effective teaching. The second five are called **helping behaviors,** because they can be used in combinations to implement the key behaviors. These are the five key behaviors essential for effective teaching:

1. Lesson clarity
2. Instructional variety
3. Teacher task orientation
4. Engagement in the learning process
5. Student success rate

Let's take a closer look at each of these.

Figure 1.4 Coding Form for Measuring Individual Praise

USE: Whenever the teacher praises an individual student

PURPOSE: To see what behaviors the teacher reinforces through praises, and to see how the teacher's praise is distributed among the students.

Behavior Categories	Student Number		Codes
1. Perseverance or effort; worked long or hard	14	1.	3
2. Progress (relative to the past) toward achievement	23	2.	3,4
3. Success (right answer, high score) achievement	6	3.	3
4. Good thinking, good suggestions, good guess, or nice try	18	4.	3
5. Imagination, creativity, originality	8	5.	1
6. Neatness, careful work	8	6.	1
7. Good or compliant behavior, follows rules, pays attention	8	7.	1
8. Thoughtfulness, courtesy, offering to share, prosocial behavior		8.	
9. Other (specify)		9.	
		10.	
		11.	
		12.	
		13.	
		14.	
		15.	
		16.	
		17.	
		18.	
		19.	
		20.	
		21.	
		22.	
		23.	
		24.	
		25.	

NOTES:

All answers occurred during social studies discussion.

Was particularly concerned about #8, a low-achieving male.

Source: From Thomas L. Good and Jere E. Brophy, *Looking in Classrooms*, 5/e. Published by Allyn and Bacon, Boston, MA. Copyright © 1991 by Pearson Education. Reprinted by permission of the publisher.

Lesson Clarity

Lesson clarity refers to how clear a teacher's presentation is to the class, as indicated in the following points:

More Effective Teachers

- Make ideas clear to learners who may be at different levels of understanding.
- Explain concepts in ways that help students follow along in a logical, step-by-step order.

- Have an oral delivery that is direct, audible to all students, and free of distracting mannerisms.

Less Effective Teachers

- Use vague, ambiguous, or indefinite language, such as "might probably be," "tends to suggest," and "could possibly happen."
- Use overly complicated sentences, such as "There are many important reasons for the start of World War II, but some are more important than others, so let's start with those that are thought to be important but really aren't."
- Give directions that often result in student requests for clarification.

One result from research on lesson clarity is that teachers vary considerably on this behavior. Not all teachers are able to communicate clearly and directly to their students without wandering, speaking above students' levels of comprehension, or using speech patterns that impair their presentation's clarity (Brophy, 2002; Brown & Wragg, 1993; Cruickshank & Metcalf, 1994; Muijs & Reynolds, 2005; Wilen, 1991).

If you teach with a high degree of clarity, you will spend less time going over material. Your questions will be answered correctly the first time, allowing more time for instruction. Clarity is a complex behavior because it is related to many others, such as your organization of the content, lesson familiarity, and delivery strategies (whether you use a discussion, recitation, question-and-answer, or small-group format). Nevertheless, research shows that both the cognitive and oral clarity of presentations vary substantially among teachers. This in turn produces differences in student performance on cognitive tests of achievement (Marx & Walsh, 1988; Muijs & Reynolds, 2005). Table 1.2 summarizes some of the indicators of lesson clarity and teaching strategies you will learn about in this text, especially in Chapters 7 (on direct instruction), 8 (on indirect instruction), and 9 (on questioning strategies).

Table 1.2 Indicators for Clarity

Being Clear (An effective teacher . . .)	Examples of Teaching Strategies
1. Informs learners of the lesson objective (e.g., describes what behaviors will be tested or required on future assignments as a result of the lesson)	Prepare a behavioral objective for the lesson at the desired level of complexity (e.g., knowledge, comprehension, etc.). Indicate to learners at the start of the lesson in what ways the behavior will be used in the future.
2. Provides learners with an advance organizer (e.g., that places the lesson in the perspective of past and/or future lessons)	Consult or prepare a unit plan to determine what task-relevant prior learning is required for this lesson and what task-relevant prior learning this lesson represents for future lessons. Begin the lesson by informing the learner that the content to be taught is part of this larger context.
3. Checks for task-relevant prior learning at the beginning of the lesson (e.g., determines the level of understanding of prerequisite facts or concepts and reteaches if necessary)	Ask questions of students at the beginning of a lesson or check assignments regularly to determine if task-relevant prior knowledge has been acquired.
4. Gives directives slowly and distinctly (e.g., repeats directives when needed or divides them into smaller pieces)	Organize procedures for lengthy assignments in step-by-step order, and give them as a handout as well as orally.
5. Knows ability levels and teaches at or slightly above learners' current level of understanding (e.g., knows learners' attention spans)	Determine learners' ability level from standardized tests, previous assignments, and interests, and retarget instruction accordingly.
6. Uses examples, illustrations, and demonstrations to explain and clarify (e.g., uses visuals to help interpret and reinforce main points)	Restate main points in at least one modality other than the one in which students were initially taught (e.g., visual vs. auditory).
7. Provides a review or summary at the end of each lesson	Use key phrases, repetition, or easy-to-memorize symbols to help students efficiently store and later recall content.

Instructional Variety

The term **instructional variety** refers to your variability or flexibility of delivery during the presentation of a lesson (Brophy, 2002; Brophy & Good, 1986; Marzano, Pickering & Pollock, 2004; Rohrkemper & Corno, 1988). One of the most effective ways of creating variety during instruction is to ask questions. As you will learn in Chapter 9, many different types of questions can be integrated into the pacing and sequencing of a lesson to create meaningful variation (Chuska, 2003; Falk & Blumenreich, 2005; Wilen, 1991). Therefore, the effective teacher needs to know the art of asking questions and how to discriminate among different question formats—fact questions, process questions, convergent questions, and divergent questions. These question types are introduced in Chapter 9 and expanded on in Chapter 10.

Another aspect of variety in teaching is perhaps the most obvious: the use of learning materials, equipment, displays, and space in your classroom. The physical texture and visual variety of your classroom can contribute to instructional variety. This in turn influences student achievement on end-of-unit tests, performance assessments, and student engagement in the learning process (Walqui, 2000). For example, some studies found the amount of disruptive behavior to be less in classrooms that had more varied activities and materials (Emmer & Evertson, 2009; Evertson & Emmer, 2009). Others have shown variety to be related to student attention (Borich, 2004, 2008a; Lysakowski & Walberg, 1981).

Some ways to incorporate variety into your teaching are presented in Chapter 7 (on direct instruction), Chapter 8 (on indirect instruction), and Chapter 11 (on cooperative learning and the collaborative process). Table 1.3 summarizes some of the indicators of instructional variety and teaching strategies covered in these chapters.

Teacher Task Orientation

Teacher task orientation is a key behavior that refers to how much classroom time the teacher devotes to teaching an academic subject. The more time allocated to teaching a specific topic, the greater the opportunity students have to learn.

Table 1.3 Indicators for Variety

Using Variety (An effective teacher . . .)	Examples of Teaching Strategies
1. Uses attention-gaining devices (e.g., begins with a challenging question, visual, or example)	Begin the lesson with an activity in a modality that is different from the last lesson or activity (e.g., change from listening to seeing).
2. Shows enthusiasm and animation through variation in eye contact, voice, and gestures (e.g., changes pitch and volume, moves about during the transition to a new activity)	Change position at regular intervals (e.g., every 10 minutes). Change speed or volume to indicate that a change in content or activity has occurred.
3. Varies modes of presentation (e.g., presents, asks questions, then provides for independent practice [daily])	Establish an order of daily activities that rotates cycles of seeing, listening, and doing.
4. Uses a mix of rewards and reinforcers (e.g., extra credit, verbal praise, independent study, etc. [weekly, monthly])	Establish lists of rewards and expressions of verbal praise, and choose among them randomly. Provide reasons for praise along with the expression of it.
5. Incorporates student ideas or participation in some aspects of instruction (e.g., uses indirect instruction or divergent questioning [weekly, monthly])	Occasionally plan instruction in which student opinions are used to begin the lesson (e.g., "What would you do if . . .").
6. Varies types of questions (e.g., divergent, convergent, [weekly] and probes (e.g., to clarify, to solicit, to redirect [daily])	Match questions to the behavior and complexity of the lesson objective. Vary the complexity of the lesson objectives in accord with the unit plan.

An important key behavior for effective teaching is the variability or flexibility of delivery during the presentation of a lesson.

For example, Table 1.4 shows the results achieved in a second-grade reading class when the teacher's task orientation—or time teaching an academic subject—was increased over a 5-week period. Increasing the time devoted to this instructional objective from 4 minutes to 52 minutes a day, over an average of only 25 school days, yielded an increase of 27 percentile points (from 39 to 66) on a standardized achievement test. The researchers who recorded these data indicated that although such large increases in instructional time might appear unusual, they actually were achieved by teachers in these elementary school classrooms.

Some task-related questions a teacher must answer are (1) How much time do I spend planning for teaching and getting my students ready to learn? (2) How much time do I spend presenting, asking questions, and encouraging students to inquire or think independently? and (3) How much time do I spend assessing my learners' performance?

These questions pertain to how much material is presented, learned, and assessed, as opposed to how much time is delegated to procedural matters (for example, taking attendance, distributing handouts, collecting homework, checking for materials). All teachers need to prepare their students to learn and want them to enjoy learning. However, most

Table 1.4 Learning Time and Student Achievement: Example from Second-Grade Reading

Reading Score at First Testing (October)		Student Engaged Time in Reading with High Success Rate		Estimated Reading Score, Second Testing (December)	
Raw Score (out of 100)	Percentile	Total Time over 5 Weeks (Minutes)	Average Daily Time (Minutes)	Raw Score (out of 100)	Percentile
36	50	100	4	37	39
36	50	573	23	43	50
36	50	1,300	52	52	66

Note: An average of 25 school days occurred between the first and second testing.

Source: From *Teaching and Learning in the Elementary School: A Summary of the Beginning Teacher Evaluation Study*, Beginning Teacher Evaluation Study Report VII-1, by Charles W. Fisher et al., 1978. San Francisco: Far West Laboratory for Research and Development.

Table 1.5 Indicators for Teacher Task Orientation

Being Task Oriented (An effective teacher . . .)	Examples of Teaching Strategies
1. Develops unit and lesson plans that reflect the most relevant features of the curriculum guide or adopted text (e.g., each unit and lesson objective can be referenced back to the curriculum guide or text)	Key each lesson to a unit plan, the curriculum guide, and the text to test its relevance. Confer with other teachers concerning the most relevant portions of the text and curriculum guide.
2. Handles administrative and clerical interruptions efficiently (e.g., visitors, announcements, collection of money, dispensing of materials and supplies) by anticipating and organizing some tasks and deferring others to noninstructional time	Establish a 5- to 10-minute restriction on how much time per every hour of instruction you will devote to noninstructional tasks. Defer all other tasks to before or after the lesson.
3. Stops or prevents misbehavior with a minimum of class disruption (e.g., has established academic and work rules to prevent intrusions into instructional time)	Establish rules for the most common misbehaviors, and post them conspicuously. Identify only the offender and offense during instructional time, deferring the consequence to later.
4. Selects the most appropriate instructional model for the objectives being taught (e.g., primarily uses direct instruction for knowledge and comprehension objectives and indirect instruction for inquiry and problem-solving objectives)	Using your unit plan, curriculum guide, or adopted text, divide the content to be taught into (a) facts, rules, and action sequences, and (b) concepts, patterns, and abstractions. Generally, plan to use direct instruction for the former content and indirect instruction for the latter.
5. Builds to unit outcomes with clearly definable events (e.g., weekly and monthly review, feedback, and testing sessions)	Establish a schedule in which major classroom activities begin and end with clearly visible events (e.g., minor and major tests, review and feedback sessions).

researchers agree that student performance is higher in classrooms with teachers who spend the maximum amount of time available teaching subject-specific content, as opposed to devoting large amounts of time to the process and materials needed to acquire that content. It follows that classrooms in which teacher–student interactions focus primarily on subject-matter content, which allows students the maximum opportunity to learn and to practice what was taught, are more likely to have higher rates of achievement. But these classrooms also are those in which the relationship between the teacher and learners provides the energy to motivate and challenge learners to reach increasingly higher levels of understanding (Berliner & Biddle, 1995; Brophy, 2002; Jones, Jones, Jones, & Jones, 2007; Porter, 1993).

These topics are covered in Chapter 3, which prepares you to set goals and prepare objectives, and Chapter 4, which prepares you to execute them in your classroom with unit and lesson plans. Table 1.5 summarizes some of the indicators of a teacher's task orientation and the effective teaching strategies that are covered in these chapters.

Engagement in the Learning Process

Student engagement in the learning process, or **engaged learning time,** is a key behavior that refers to the amount of time students devote to learning in your classroom. Student engagement is related to but different from a teacher's task orientation. We learned in the previous section that a teacher's task orientation should provide students the greatest possible opportunity to learn and practice the material to be assessed.

Distinct from your task orientation—or the amount of time you devote to teaching a topic—is the time your students are actively engaged in learning the material being taught. This has been called their *engagement rate,* or the percentage of time devoted to learning when your students are actually on task, engaged with the instructional materials, and benefiting from the activities being presented. Even though a teacher may be task oriented, providing maximum content coverage, the students may be disengaged. This means they are not actively thinking about, working with, or using what is being

presented (Borich, 2008a; Borich & Tombari, 1997; Jones et al., 2007; Marx & Walsh, 1988; Savage, 1991; Weinstein & Mignano, 1996).

Such disengagement can involve an emotional or mental detachment from the lesson that may or may not be obvious. When students jump out of their seats, talk, read a magazine, or leave for the restroom, they obviously are not engaged in instruction. Students also can be disengaged in far more subtle ways, such as looking attentive while their thoughts are many miles away. An unpleasant fact of life is that one-quarter of a class may be off task at any time, distracted for personal reasons that are often amplified by an impending lunch period, a Friday afternoon, or the day before a holiday. Correcting this type of disengagement may be difficult, requiring changes in the structure of the task itself and the cognitive demands placed on the learner (Baum, Viens, & Slatin, 2005; Bennett & Desforges, 1988; Brophy, 1996; Doyle, 1983). Strategies for composing tasks and activities that elicit the active participation of your learners are presented in Chapters 7 through 11.

Several authors (Evertson, 1995; Kuh, Kinzie, Smith, & Whitt, 2005; Meichenbaum & Biemiller, 1998; Tauber, 1990) have contributed useful suggestions for increasing learning time and more importantly student engagement during learning. Their work, updated by Emmer and Evertson (2009) and Evertson and Emmer (2009), has provided the following suggestions for teachers to promote student engagement:

1. Set rules that let pupils attend to their personal needs and work routines without obtaining your permission each time.
2. Move around the room to monitor pupils' seatwork and to communicate your awareness of students' progress.
3. Ensure that independent assignments are interesting, worthwhile, and easy enough to be completed by each pupil without your direction.
4. Minimize time-consuming activities, such as giving directions and organizing the class for instruction, by writing the daily schedule on the board. This will ensure that pupils know where to go and what to do.
5. Make abundant use of resources and activities that are at or slightly above a student's current level of understanding.
6. Avoid timing errors. Act promptly to prevent misbehaviors from occurring or increasing in severity so they do not influence others in the class.

These teaching practices have also been found to be beneficial for small groups and independent seatwork (Anderson, Stevens, Prawat, & Nickerson, 1988; Jones et al., 2007). These and other more specific ways of increasing your students' engagement rate are explored in Chapters 10 and 11, which cover strategies for self-directed learning and cooperative and collaborative learning. Table 1.6 summarizes some of the indicators of student engagement and effective teaching strategies covered in these chapters.

Student Success Rate

Our final key effective teaching behavior is student success rate. The term **student success rate** refers to the rate at which your students understand and correctly complete exercises and assignments.

A crucial aspect of the previously cited research on teacher task orientation and student engagement has been the level of difficulty of the material being presented. In some of these studies, level of difficulty was measured by the rate at which students understood and correctly answered questions on tests, exercises, and assignments. Three levels of difficulty are as follow:

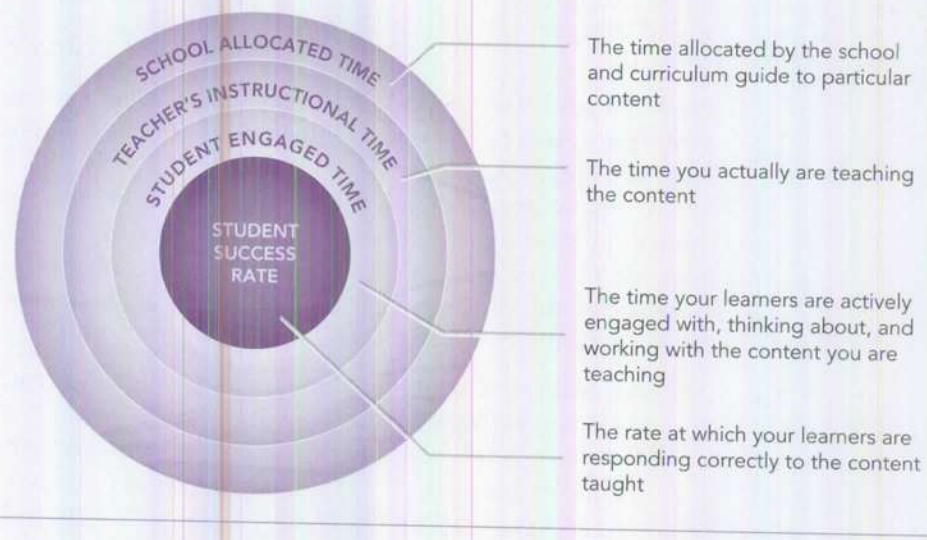
- *High success.* The student understands the subject matter taught and makes only occasional careless errors.
- *Moderate success.* The student has partial understanding but makes some substantive errors.
- *Low success.* The student has little or no understanding of the subject matter.

Table 1.6 Indicators for Engaging Students in the Learning Process

Engaging Students Effectively in the Learning Process (An effective teacher . . .)	Examples of Teaching Strategies
1. Elicits the desired behavior immediately after the instructional stimuli (e.g., provides exercise or workbook problems to practice the desired behavior).	Schedule practice exercises or questions to immediately follow each set of instructional stimuli.
2. Provides opportunities for feedback in a nonevaluative atmosphere (e.g., asks students to respond as a group or covertly the first time through the material)	Require covert responding or nonevaluative (e.g., group) feedback at the start of a guided practice session.
3. Uses individual and group activities when needed (e.g., performance contracts, CD-ROMs, games and simulations, and learning centers as motivational aids)	Have individualized instructional materials available (e.g., remedial exercises or supplemental texts) for those students who may need them.
4. Uses meaningful verbal praise to get and keep students actively participating in the learning process	Maintain a warm and nurturing atmosphere by providing verbal praise and encouragement that is meaningful (e.g., explain why the answer was correct). Praise partially correct answers, with qualification.
5. Monitors seatwork and frequently checks progress during independent practice	Limit contact with individual students during seatwork to about 30 seconds each, providing instructionally relevant answers. Circulate among the entire class.

Not surprisingly, Berliner (1979), Good and Brophy (2007), Karweit and Slavin (1981), and Marzano, Pickering, and Pollock (2004), found that student engagement—that is, the time the learner is actively engaged with, thinking about, and working with the content being taught—was closely related to student success rate, as shown in Figure 1.5. Instruction that produces a moderate to high success rate results in increased performance, because more content is covered at the learner's current level of understanding. This result was initially found for expository or didactic forms of instruction, with which learners are taught basic academic skills that are most easily learned through practice and repetition (Rosenshine, 1986). But more recent research has extended these findings to thinking-skills instruction (Beyer, 1995) and project-based learning (Blumenfeld et al.,

Figure 1.5 Levels of Time



1991; Costa & Kallick, 2004a,b). Research has also shown that instruction promoting low error rates (high success) can contribute to increased levels of student self-esteem and positive attitudes toward the subject matter and the school (Slavin, 1991b), which provide the motivation to move toward higher levels of achievement.

The average student in a typical classroom spends about half of the time working on tasks that provide the opportunity for high success. But researchers have found that students who spend more than the average time in high-success activities have higher achievement, better retention, and more positive attitudes toward school. These findings have led to the suggestion that students should spend about 60% to 70% of their time on tasks that allow almost complete understanding of the material being taught with only occasional errors (Brophy, 2002; Rosenshine, 1986).

Moderate to high success rates can produce mastery of lesson content. But they can also provide the foundation for your students to apply what they have learned and to reason, problem solve, and think critically and independently about the content (Chaffee, 2008; Duffy & Roehler, 1989; Meichenbaum & Biemiller, 1998; Rohrkemper & Corno, 1988). Many teachers devote insufficient time to this stage of learning, which is particularly crucial for attaining the goals of problem solving and critical thinking. A key activity for the effective teacher is organizing and planning instruction that yields moderate to high success rates but then challenges learners to go beyond the information given to construct their own understandings and meanings from lesson content.

We will learn more about this approach to learning, called *constructivism* (Chaille, 2007; Fosnot, 2005; Richardson, 1997), in this chapter and Chapters 8 and 10. Table 1.7 summarizes some of the indicators of student success and the teaching strategies covered in these chapters.

Summary of Five Key Behaviors

All five key behaviors—lesson clarity, instructional variety, teacher task orientation, student engagement, and success rate—are essential for effective teaching. Classroom researchers continue to study other effective teaching behaviors and to attain a more

Table 1.7 Indicators for Student Success

Moderate to High Rates of Success (An effective teacher . . .)	**Examples of Teaching Strategies**
1. Establishes unit and lesson content that reflects prior learning (e.g., planning lesson sequences that consider task-relevant prior information)	Create a top-down unit plan, in which all the lesson outcomes at the bottom of the hierarchy that are needed to achieve unit outcomes at the top of the hierarchy are identified. Arrange lessons in the order most logical for achieving unit outcomes.
2. Administers correctives immediately after the initial response (e.g., shows a model of the correct answer and how to attain it after the first crude response is given)	Provide for guided practice prior to independent practice, and provide a means of self-checking (e.g., a handout with the correct answers) at intervals of practice.
3. Divides instructional stimuli into small chunks (e.g., establishes discrete, focused lessons that can be easily understood by learners at their current level of functioning)	Plan interdisciplinary thematic units to emphasize relationships and connections that are easily remembered.
4. Plans transitions to new material in easy-to-grasp steps (e.g., changes instructional stimuli according to an established thematic pattern so that each new lesson is seen as an extension of previous lessons)	Extend the unit plan hierarchy downward to more specific lessons that are tied together above with a single unit theme and outcome.
5. Varies the pace at which stimuli are presented and continually builds toward a climax or key event	Use review, feedback, and testing sessions to form intervals of increasing and decreasing intensity and expectation.

thorough understanding of those already described. However, for the first time, research has provided a basis for more clearly defining effective teaching and for training teachers. These five behaviors are the skeleton of the effective teacher, and the remainder of this text will use these to construct the heart, mind, and body of the effective teacher.

You learned earlier there can be no simple answer to the question, What is an effective teacher? Many activities must be orchestrated into patterns of behavior for your teaching to be effective. The identification of only five behaviors makes teaching appear deceptively simple. However, as the following section reveals, your success in implementing these five key behaviors in the classroom will be assisted by many other helping behaviors.

SOME HELPING BEHAVIORS RELATED TO EFFECTIVE TEACHING

To complete our picture of an effective teacher, we also need to discuss other behaviors that will help you implement the five key behaviors in your classroom. These can be thought of as helping behaviors for performing the five key behaviors.

Research findings for helping behaviors, although promising, are not as strong and consistent as those that identified the five key behaviors. Research has not identified explicitly how these behaviors should be used. This is why helping behaviors need to be employed in the context of other behaviors to be effective, making them catalysts rather than agents by themselves (Marzano, Pickering, & Pollock, 2004; Saunders, 2005). Among these helping behaviors are the following:

1. Using student ideas and contributions
2. Structuring
3. Questioning
4. Probing
5. Teacher affect (developing the teacher–learner relationship)

Using Student Ideas and Contributions

Using student ideas and contributions is a behavior that includes acknowledging, modifying, applying, comparing, and summarizing student responses to promote the goals of a lesson and encourage student participation. Note how any one of these activities (Flanders, 1970) could be used to achieve one or more of the five key behaviors:

- *Acknowledging:* Taking a student's correct response and repeating it to the class (to increase lesson clarity)
- *Modifying:* Using a student's idea by rephrasing it or conceptualizing it in your words or another student's words (to create instructional variety)
- *Applying:* Using a student's idea to teach an inference or take the next step in a logical analysis of a problem (to increase success rate)
- *Comparing:* Taking a student's idea and drawing a relationship between it and ideas expressed earlier by the student or another student (to encourage engagement in the learning process)
- *Summarizing:* Using what was said by a student or a group of students as a recapitulation or review of concepts taught (to enhance task orientation)

More recently, the use of student ideas and contributions has been extended to reasoning, problem solving, and independent thinking. This has been achieved through **teacher-mediated dialogue** that helps learners restructure what is being learned using their own ideas, experiences, and thought patterns. Teacher-mediated dialogue asks learn-

ers not just to respond with a correct answer but also to internalize the meaning of what was learned by elaborating, extending, and commenting on it using their own thoughts. In this manner, learners are encouraged to communicate the processes by which they are learning, thereby helping them to construct their own meanings and understandings of the content (Chaille, 2007; Fosnot, 2005; Phillips, 2000; Richardson, 1997). We will present strategies for constructivist teaching and teacher-mediated dialogue in Chapters 8 and 10.

Use of student ideas and contributions also can increase a student's engagement in the learning process. Thus it has become a frequently used catalyst for helping achieve that key behavior (Emmer & Evertson, 2009; Evertson & Emmer, 2009). Consider this brief instructional dialogue, which uses student ideas to promote engagement:

Teacher: Tom, what is the formula for the Pythagorean theorem?
Tom: $c^2 = a^2 + b^2$.

At this point the teacher simply could have said "Good!" and gone on to the next question. Instead, the teacher continues:

Teacher: Let's show that on the board. Here is a triangle; now let's do exactly as Tom said. He said that squaring the altitude, which is *a*, and adding it to the square of the base, which is *b*, should give us the square of the hypotenuse, which is *c*. Carl, would you like to come up and show us how you would find the length of *c*, using the formula Tom just gave us?
Carl: Well if *a* were equal to 3 and *b* equal to 4, the way I would solve this problem would be to add the squares of both of them together and then find the square root—that would be *c*.
Teacher: So we square the 3, square the 4, add them together, and take the square root. This gives us 5, the length of the hypotenuse.

Which of the five ways of using student ideas are in this dialogue? First, by putting Tom's response graphically on the blackboard, this teacher applies Tom's answer by taking it to the next step, constructing a proof. Second, by repeating orally what Tom said, the teacher acknowledges to the entire class the value of Tom's contribution. And third, by having another student prove the correctness of Tom's response, a summary of the concept is provided. All this is accomplished from Tom's simple (and only) utterance: $c^2 = a^2 + b^2$.

Research indicates that student ideas and contributions, especially when used in the context of the naturally occurring dialogue of the classroom, are more strongly and consistently related to student engagement than simply approving a student's answer with "Good!" (Brophy, 1981; Good & Brophy, 2007). The standard phrases we use to acknowledge and reward students ("Correct," "Good," "Right") are so overused that they may not always convey the reward intended.

Although the use of student ideas looks simple, it takes skill and planning. Even when you have not planned your response, you should be prepared to seize opportunities to incorporate student ideas and contributions into your lesson.

Structuring

Teacher comments made for the purpose of organizing what is to come or summarizing what has gone before are called *structuring*. Used before an instructional activity or question, structuring assists learners in bridging the gap between what they are capable of doing on their own and what they are capable of doing with help from the teacher, thereby aiding their understanding and use of the material to be taught. Used at the conclusion of an instructional activity or question, structuring reinforces learned content and places

it in proper relation to other content already taught. Both forms of structuring are related to student achievement and serve as effective catalysts for performing the five key behaviors (Meichenbaum & Biemiller, 1998; Rogoff, 1990; Rosenshine & Meister, 1992).

Typically, before and after structuring takes the following form:

Teacher: [At beginning of lesson] OK, now that we have studied how the pipefish change their color and movements to blend in with their surroundings, we will study how the pipefish gathers its food. Most important, we will learn how the pipefish grow and provide the means for other fish, like the kind we eat for food, to flourish deep below the ocean's surface.

Teacher: [At end of lesson] So we have discovered that the pipefish protects itself by changing colors to blend in with plants on the ocean's floor and by swaying back and forth to fool its enemies. We might conclude from this that the pipefish evade rather than capture their natural enemies and feed close to the ocean's floor, where they can't be noticed. Can you think of when this clever strategy might not work, making the pipefish prey to other fish deep below the ocean's surface? (Palincsar & Brown, 1989)

This sequence illustrates some of the many ways you can use structuring. One way is to *signal* that a shift in direction or content is about to occur. A clear signal alerts students to the impending change. Without such a signal, students may confuse new content with old, missing the differences. Signals such as "Now that we have studied how the pipefish change their color and movements, . . . we will learn . . ." help students switch gears and provide a perspective that makes new content more meaningful.

Another type of structuring uses *emphasis.* Can you find a point of emphasis in the previous dialogue? By using the phrase "Most important," this teacher alerts students to the knowledge and understanding expected at the conclusion of this activity. This structuring helps the student to organize what is to follow, called an *advance organizer.*

In this instance, the students are clued to consider the factors that extend beyond the color and movement of the pipefish to include how they grow and provide the means for other fish to flourish. This makes the teacher's final question more meaningful ("Can you think of when this clever strategy might not work, making the pipefish prey to other fish deep below the ocean's surface?"). The students have been clued that such a question might be raised and that generalizations beyond the concepts discussed will be expected. Phrases such as "Now this is important," "We will return to this point later," and "Remember this" are called *verbal markers.* They can be used to emphasize your most important points.

In addition to verbal markers and advance organizers, the effective teacher organizes a lesson into an activity structure. An *activity structure* is a set of related tasks that differ in cognitive complexity and that to some degree may be placed under the control of the learner. Activity structures (Marx & Walsh, 1988; Meichenbaum & Biemiller 1998; Rogoff, 1990) can be built in many ways (e.g., cooperatively, competitively, independently) to vary the demands they make on the learner and to give tempo and momentum to a lesson. For the effective teacher, they are an important means for engaging students in the learning process and moving them from simple recall of facts to the higher response levels that require reasoning, critical thinking, and problem-solving behavior.

Questioning

Questioning is another important helping behavior. Few other topics have been researched as much as the teacher's use of questions (Dantonio & Beisenherz, 2000; Falk & Blumenreich, 2005; Power & Hubbard, 1999). One of the most important outcomes of research on questioning has been the distinction between *content questions* and *process questions.*

Content Questions. Teachers pose content questions to have the student deal directly with the content taught. An example is when a teacher asks a question to see whether students can recall and understand specific material. The correct answer is known well in advance by the teacher. It also has been conveyed directly in class, in the text, or both. Few if any interpretations or alternative meanings of the question are possible.

Researchers have used various terms to describe content questions, such as the following:

Types of Content Questions

- *Direct:* The question requires no interpretation or alternative meanings.
  Example: What is the meaning of the word *ancient* in the story just read?
- *Lower order:* The question requires the recall only of readily available facts, as opposed to generalizations and inferences.
  Example: What was the mechanical breakthrough that gave the cotton gin superiority over all previous machines of its type?
- *Convergent:* Different data sources lead to the same answer.
  Example: What is one of the chemical elements in the air we breathe?
- *Closed:* The question has no possible alternative answers or interpretations.
  Example: What is the function of a CPU in a computer?
- *Fact:* The question requires the recall only of discrete pieces of well-accepted knowledge.
  Example: What is the result of dividing the number 47 by 6?

Some estimates have suggested that up to 80% of the questions teachers ask refer directly to specific content and have readily discernible and unambiguous correct answers (Gall, 1984; Gall & Gall, 1990). Perhaps even more important is the fact that approximately the same percentage of teacher-made test items (and behavioral objectives) are written at the level of recall, knowledge, or fact (Borich & Tombari, 1997, 2004). Therefore, test items, behavioral objectives, and most instruction seem to emphasize readily known facts as they are presented in curriculum guides, workbooks, and texts, leaving much less time for encouraging higher-order thinking, such as problem solving, decision making, and valuing.

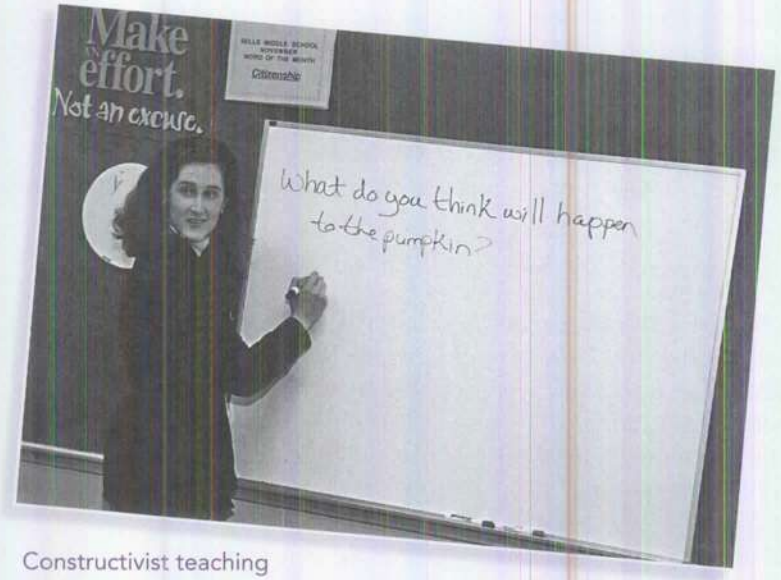
The art of questioning will become one of your most important skills as a teacher. The variety you convey to your students will be determined in large measure by your flexible use of questions. Asking questions is rarely an end in itself but rather a means of engaging students in the learning process by getting them to act on, work through, or think about the material presented.

Process Questions. From the previous discussion, you can see why not all questions can be content questions. There are different purposes for which questions can be asked, with the intent of encouraging different mental processes. To problem solve, to guide, to arouse curiosity, to encourage creativity, to analyze, to synthesize, and to judge also are goals of instruction that should be reflected in your questioning strategies. For these goals, learning content is not a goal by itself but a means of achieving higher-order goals.

Researchers have used various terms to describe process questions, such as the following:

Types of Process Questions

- *Indirect:* The question has various possible interpretations and alternative meanings.
  Example: What are some of the ways you have used the word *ancient?*
- *Higher order:* The question requires more complex mental processes than simple recall of facts (e.g., making generalizations and inferences).
  Example: What were the effects of the invention of the cotton gin on attitudes in the North?



Constructivist teaching strategies emphasize the learner's direct experience and the dialogue of the classroom as instructional tools.

- *Divergent:* Different data sources will lead to different correct answers.
  Example: From what we know about the many forms of pollution today, what would be one of the first things we have to do to clean the air we breathe?
- *Open:* A single correct answer is not expected or even possible.
  Example: How have recent advances in computer technology influenced your life?
- *Concept:* The question requires the processes of abstraction, generalization, and inference.
  Example: Using examples of your own choosing, what are some of the ways division and subtraction are similar?

Can you see the difference between this set of process questions and the set of content questions that preceded it? Notice that the process questions encourage more thinking and problem solving by requiring the learner to use personal sources of knowledge to actively construct her or his own interpretations and meanings, rather than acquiring understanding by giving back knowledge already organized in the form in which it was told.

As we saw earlier, this view of teaching and learning represents a movement in education called *constructivism*. **Constructivist teaching strategies** emphasize the learner's direct experience and the dialogue of the classroom as instructional tools while deemphasizing lecturing and telling (Chaille, 2007; Fosnot, 2005; Phillips, 2000; Richardson, 1997). See In Practice: Focus on Constructivism.

Process questions and the use of probes, our next helping behavior, are important aids in constructivist thinking and action in the classroom. We will have more to say about the role of direct experience and the use of constructivist strategies in the classroom in the chapters ahead, especially Chapters 8 and 10.

Probing

Another helping behavior is *probing,* which refers to teacher statements that encourage students to elaborate on an answer, either their own or another student's. Probing may take the form of a general question or can include other expressions that *elicit* clarification of an answer, *solicit* additional information about a response, or *redirect* a student's response in a more fruitful direction. Probing often is used to shift a discussion to some higher thought level.

Generally, student achievement is highest when the eliciting, soliciting, and (if necessary) redirecting occur in cycles. This systematically leads the discussion to a higher level of complexity, as when interrelationships, generalizations, and problem solutions are being sought. In this manner, you may begin a lesson with a simple fact question; then by eliciting clarification of student responses, soliciting new information, or redirecting an answer, you can move to a higher level of questioning.

A typical cycle might occur in the following manner:

Teacher: Bobby, what is a scientific experiment?
Bobby: Well, it's when you test something.
Teacher: But what do you test? [Elicit]
Bobby: Mmm, something you believe in and want to find out if it's really true.

IN PRACTICE

FOCUS ON CONSTRUCTIVISM

Constructivism is a philosophy of learning that explains how people come to understand or know. In the late 1980s and early 1990s, many psychologists began to turn their attention to the constructivist view of learning, which assumes that learning is an active process in which learners internally construct knowledge from interpretations of their interactions with their physical and social environments. This view does not necessarily deny the existence of an objective reality, but it does recognize the limitations such a reality places on what people can know, since knowledge always stands in relation to the context from it was derived and the experiences of the observer who must make sense of it. Given this, constructivists believe that many of the things we know are interpretations influenced by context and prior experiences. Conceptual growth, from a constructivist perspective, results from sharing multiple perspectives and refining our interpretations in response to other perspectives.

Constructivists focus on engaging learners in richly textured contexts that are reflective of the natural environment. In such an environment, learners have opportunities to negotiate meanings and collaborate with each other. As a result, learners exposure to multiple perspectives and opportunities to actively construct, refine, and take ownership of what they see and the meanings they derive from it. The knowledge constructed from this context is complex, personal, and insightful, which more easily allows learners to transfer it beyond textbook and classroom. By being able to construct meaning for themselves, students take ownership of their learning and teachers serve as facilitators that help students grow. Teachers are no longer information transmitters; instead, they provide guidance and scaffolding with which students can discover knowledge for themselves. In a constructivist learning environment, teachers promote a learning climate and context that extends students' experiences and interests, thus providing students with the opportunity to see multiple perspectives and develop their own understandings.

Savery and Duffy (1995) identify three essential attributes of constructivism:

1. Cognitive conflict or confusion is the stimulus for learning and influences the reorganization and nature of what is learned. According to Dewey (1938), it is the problem that leads to and is the organizer for learning, and according to Piaget (1977), it is the need for accommodation when the current experience cannot be assimilated into the learner's existing schema.
2. Knowledge evolves through negotiation and evaluation of the viability of individual understandings, primarily because shared language and knowledge contribute a great deal to how reality is actively constructed for each individual. Other individuals are a primary mechanism for testing the understanding. Collaborative groups are important because learners can test their own understanding and examine the understanding of others as a mechanism for enriching, interweaving, and expanding the understanding of particular issues or phenomena. Other people are the greatest source of alternative views.
3. Understanding comes from one's interactions with the environment. Cognition is not only within the individual but also comes from perceptions and experiences that are distributed across the entire context in which the learner is situated.

By examining the perspectives of constructivism, we can recognize that learning is an ongoing and active process and inquiry is an appropriate vehicle for facilitating the cognitively based constructivist approach to learning. In an inquiry-based learning environment, students are engaged in a hands-on, subject-related questioning, problem solving, or investigation, during which they observe, question, and gather information to test their understanding in an ongoing and active process (Llewellyn, 2002).

Teacher: What do you mean by that? [Solicit]
Mary: He means you make a prediction.
Teacher: What's another word for *prediction*? [Redirect]
Tom: Hypothesis. You make a hypothesis and then go into the laboratory to see if it comes true.

Now find the teacher's soliciting, eliciting, and redirecting behaviors in the remainder of the dialogue:

Teacher: OK. So a scientist makes a prediction or hypothesis and follows up with an experiment to see if it can be made to come true. Then what?
Billy: That's the end!
Teacher: [No comment for 10 seconds; then discussion continues.] Is the laboratory like the real world?
David: The scientist tries to make it like the real world, but it's much smaller, like the greenhouse pictured in our book.
Teacher: So what must the scientist do with the findings from the experiment, if they are to be useful? [No one answers, so the teacher continues.] If something important happens in my experiment, wouldn't I argue that what happened could also happen in the real world?
Bobby: You mean, if it's true in a specific situation, it will also be true in a more general situation?
Betty Jo: That's making a generalization.
Teacher: Good. So we see that a scientific investigation usually ends with a generalization. Let's summarize. What three things does a scientific investigation require?
Class: A prediction, an experiment, and a generalization.
Teacher: Good work, class.

Notice that all of the ingredients in this teacher's lesson were provided by the class. The concepts of hypothesis, experiment, and generalization were never defined for the class. The students defined these concepts for themselves with only an occasional "OK" or "Good" from the teacher to let them know they were on track. The teacher's role was limited to eliciting clarification, soliciting additional information, and redirecting the discussion. The purpose of this cycle of eliciting, soliciting, and redirecting is to promote inquiry and independent discovery of the content of the lesson. Generally, retention of material learned has been shown to be greater from inquiry teaching than from formal lecturing methods (Llewllyn, 2002; Paul, 1990).

Teacher Affect

Anyone who has ever been in a classroom where the teacher's presentation was lifeless, static, and without vocal variety can appreciate the commonsense value of the affective side of teaching. However, unlike the behaviors discussed previously, affect cannot be captured in transcripts of teaching or by classroom interaction instruments. Narrowly focused research instruments often miss a teacher's affective nature, which emerges from a more holistic view of the classroom. This affective nature is the foundation on which you can build a warm and nurturing relationship with your learners.

What the instruments miss, the students see clearly. Students are good perceivers of the emotions and intentions underlying a teacher's actions, and they often respond accordingly. A teacher who is excited about the subject being taught and shows it by facial expression, voice inflection, gesture, and movement—thus communicating respect and caring for the learner—is more likely to hold the attention of students and motivate

Effective teachers provide a warm and encouraging classroom climate by letting students know help is available.

them to higher levels of achievement than one who does not exhibit these behaviors.

Students take their cues from these affective signs and lower or heighten their engagement with the lesson accordingly. Enthusiasm is an important aspect of a teacher's affect. *Enthusiasm* is the teacher's vigor, power, involvement, excitement, and interest during a classroom presentation and willingness to share this emotion with learners, who will want to respond in kind. We know from experience that enthusiasm is contagious. It can be displayed to your students in many ways, the most common being vocal inflection, gesture, eye contact, and animation. Most important, however, is how you coordinate these signs to communicate that you care about and respect the experiences, knowledge, and understandings your students bring to the classroom. Research has found a teacher's enthusiasm to be related to student achievement (Bettencourt, Gillett, Gall, & Hull, 1983; Cabello & Terrell, 1994; Tischler, 2005). And as noted earlier, teachers' enthusiasm is believed to be important in promoting student engagement and achievement (Kuh, Kinzie, Smith, & Whitt, 2005).

Obviously, no one can maintain a heightened state of enthusiasm for very long without becoming exhausted emotionally. Nor is this what is meant by the word *enthusiasm*. A proper level of enthusiasm is far more subtle, and perhaps that is why it has been so difficult to research. A proper level of enthusiasm involves a delicate balance of vocal inflection, gesturing, eye contact, and movement. In combination, these behaviors send to students a unified signal of vigor, involvement, and interest that conveys the message that you care. Timing and the ability to incorporate these behaviors into a consistent pattern make possible an unspoken behavioral dialogue with students that is every bit as important as your spoken words.

TEACHING EFFECTIVELY WITH DIVERSE LEARNERS AND CONTENT

Researchers have uncovered behaviors of special importance to specific types of students and content. The two areas of findings that have had the most consistent results are these:

1. Teaching behaviors that affect learners of lower and higher socioeconomic status
2. Teaching behaviors that affect the teaching of reading and mathematics

How Does Effective Teaching Differ among Learners Who Have Different Socioeconomic Levels, Cultures, and Ethnicities?

The term **socioeconomic status (SES)** can mean many different things, but generally, it is an approximate index of one's income and education level. For the classroom researcher, the SES of students is determined directly by the income and education of their parents or indirectly by the nature of the school the students attend. For example, a school in which a high percentage of students qualify for a nationally sponsored free or reduced price lunch program, due to the income level of their parents, may be considered a lower-SES school.

Video Window

PEARSON myeducationlab
The Power of Classroom Practice
www.myeducationlab.com

Using Student Ideas and Contributions

In this video, you will see Rebecca teaching a lesson on gardening to her kindergarten class. Her lesson goal is to use an experience shared by most of her learners to teach vocabulary and spelling. We see how easily she accomplishes this by using the ideas and contributions of her learners, one of the five helping behaviors, to shape her lesson. As the lesson develops, find instances of the other four helping behaviors—structuring, questioning, probing, and teacher affect—and then describe them. How does the combination of all five behaviors working together help Rebecca execute a successful lesson?

Go to the Assignments and Activities section of Topic 7: "Strategies for Teaching" in the MyEducationLab for your course and complete the activity "Using Student Ideas and Contributions."

Some schools are in impoverished areas, where the overall income and education levels of the community are low, whereas other schools are located in more affluent communities. Many schools in impoverished areas qualify for special financial assistance from the federal government, based on the median income of the students' parents. These schools are called *Title I* schools, and the majority of their students come from lower-SES homes and may be disadvantaged, at risk of school failure, have limited English proficiency, and/or belong to a cultural or ethnic minority. In our nation's 25 largest cities, SES is strongly tied to culture or ethnicity.

Because the conditions to which lower-SES and higher-SES students are tied, such as access to fewer books and not having a computer in the home, are likely to exist for some time, classroom researchers have determined what teacher practices promote the most achievement in these different settings. Researchers such as Bowers and Flinders (1991), Dilworth and Brown (2001), Good and Brophy (2007), Hill (1989), Kennedy (1991), and McNary, Glasgow, and Hicks (2005) have provided suggestions for teaching these student populations, while the research of others has helped teachers understand the learning needs of these and other special populations (Delpit & Dowdy, 2008; Nieto & Bode, 2007). Some important teaching behaviors to emphasize for higher- and lower-SES learners are summarized in Table 1.8.

Notice in the table that, although each behavior is applicable to both lower- and higher-SES students, teacher affect is particularly important in lower-SES classrooms. Also notice that some of these teaching behaviors received little or no mention in our preceding discussions, because those discussions applied to students generally. Four of the behaviors shown for lower-SES classrooms (student responses, content organization, classroom instruction, and individualization) can be seen as special ways of creating student engagement at high rates of success for these learners. This presents a particular challenge when teaching lower-SES students who may be at risk of school failure.

Also, frequently correcting wrong answers in the absence of support or encouragement could be construed more often as a personal criticism by lower-SES students, who may already have a poor self-concept, than by higher-SES students. Therefore, feedback that could be construed as personal criticism would need to be provided in a consistently supportive and encouraging context (Brookhart, 2008; Cabello & Terrell, 1994).

Table 1.8 Important Teaching Behaviors for Lower-SES and Higher-SES Students

Teaching Behaviors	Examples
Helping Lower-SES Populations Achieve Success	
Teacher affect	Provide a warm and encouraging classroom climate by consistently letting students know help is available.
Student responses	Encourage an initial response from one student before moving to the next student.
Content organization	Present material with the opportunity to practice what has been learned immediately afterward.
	Show how related pieces of information fit together and are to be applied before beginning each new segment of instruction.
Classroom instruction	Emphasize applications before teaching patterns and abstractions. Present the most concrete learnings first.
	Monitor each student's progress at regular intervals. Use progress charts to help record learner improvement.
	Help students who need help immediately. Use peer and cross-age tutors, if necessary.
	Maintain the structure and flow between activities to maintain momentum. Organize and plan transitions in advance.
Individualization	Supplement the standard curriculum with specialized materials to meet the needs of individual students.
	Emphasize the importance of students' personal experiences to promote interest and attention.
Helping Higher-SES Populations Achieve Success	
Correcting	Check right answers by requiring extended oral or written reasoning.
Thinking and decision making	Supplement the curriculum with individualized material, some of which is slightly above students' current level of attainment.
	Assign homework and/or extended projects that require students to obtain original sources of information from outside the classroom.
Classroom interaction	Encourage student-to-student and student-to-teacher interactions in which students take responsibility for evaluating their own learning.
Verbal activities	Consistently engage students in verbal questions and answers that go beyond the text and workbook content.

Source: Based on information from Bowers and Flinders (1991); Good and Brophy (2007); Hill (1989); Irvine and York (2001); Kennedy (1991); Knapp and Woolverton (2001); Levine and Lezotte (2001); McNary, Glasgow, and Hicks (2005).

Because much of the research on SES has been conducted in elementary classrooms, it is as yet uncertain to what extent the teaching practices in Table 1.8 apply to secondary classrooms. However, many of the learning characteristics of higher-SES and lower-SES students appear to be similar across grade levels. Your success as a teacher in a predominantly lower-SES or higher-SES classroom will therefore depend on your ability to vary the extent to which you emphasize the behaviors in Table 1.8.

How Does Effective Teaching Differ across Content Areas?

Another set of findings pertains to the different teaching behaviors that distinguish reading and language arts from basic mathematics instruction (Ball, Lubienski, & Mewborn, 2001; Barr, 2001; Brophy & Evertson, 1976; Kaplan, Rogers, & Webster, 2008).

Although not all teachers will teach either reading or mathematics, this set of findings may be generalized to some extent to other types of content that are similar in form and structure.

For example, social studies, history, and language instruction all involve high reading content and share some of the same problem-solving features as reading. General science, biology, physics, and chemistry are similar to the science of mathematics in that concepts, principles, and laws play a prominent role. Also, visual forms and symbolic expressions are at least as important in understanding scientific subjects as is the written word. Therefore, some cautious generalizations can be made about the teaching practices that are important for reading and basic mathematics instruction and subjects similar to each.

Some important findings are summarized in Table 1.9. Notice the two different approaches implied by the practices listed. For basic mathematics instruction, at first a formal, direct approach appears to be most effective. This approach includes maintaining structure through close adherence to texts, workbooks, and application-oriented activities. This approach also maximizes instructional coverage by minimizing unstructured work that could diminish engaged learning time. In contrast, reading instruction allows for a more interactive and indirect approach, using more classroom discussions and experience-oriented questions and answers.

These approaches are not mutually exclusive, however. What the research shows is that at first a more direct approach during basic mathematics instruction tends to result in greater student progress than would, say, the exclusive use of an inquiry approach. For reading, the reverse appears to be true: At first an exploratory, interactive approach, which encourages the use of classroom dialogue and student ideas, tends to result in greater student progress over time.

These different approaches represent degrees of emphasis, not exclusive practices. Clearly, teaching the basics of mathematics will at times require an inquiry approach, just as reading sometimes requires a presentation or telling approach. More important than

Table 1.9 Important Teaching Behaviors for Reading and Mathematics Instruction

Teaching Behaviors	Examples
Findings for Reading Instruction	
Instructional activity	Devote sufficient time during reading instruction to discussing, explaining, and questioning to stimulate cognitive processes and promote learner responding.
Interactive technique	Use cues and questions that require every student to attempt a response during reading instruction.
Questions	Pose thought-provoking questions during reading instruction that require the student to predict, question, summarize, and clarify what he or she has read.
Findings for Basic Mathematics Instruction	
Instructional materials	Use application- and experience-oriented activities and media during mathematics instruction to foster task persistence.
Instructional content	Maximize coverage of instructional applications during mathematics instruction through the use of activity sheets, handouts, and problem sets at graduated levels of difficulty.
Instructional organization	Initially, emphasize full-class or large-group instruction during mathematics instruction. Gradually, transition to less guided and independent work, when it does not interfere with on-task behavior and learner persistence.

Source: Based on information from Akhavan (2008); Carpenter, Dossey, and Koehler (2004); English (2002); Grouws (1992); Kilpatrick, Martin, and Schifter (2003); National Council of Teachers of English (1996); Stone (2007).

either of these approaches, along with the practices in Tables 1.8 and 1.9 that represent them, is the ability of the teacher to be flexible. From these research studies, the message is clear: There are not only effective and ineffective ways to teach, but the effectiveness of any method will likely depend on the content being taught and the learners to whom it is being taught. The effective teacher is sensitive when a change from one emphasis to another is necessary, regardless of the content or learner being taught.

The Complexity of Teaching

At this point, you might think an effective teacher simply is one who has mastered all of the key behaviors and helping behaviors. But teaching involves more than knowledge of how to perform individual behaviors. Much like an artist, who blends color and texture into a painting to produce a coherent impression, so must an effective teacher blend individual behaviors into teaching practices that promote student achievement. Teaching practices are larger than individual teaching behaviors that blend key and helping behaviors in different degrees. To be effective requires the orchestration and integration of the key and helping behaviors into meaningful patterns and rhythms that can achieve the goals of instruction within your classroom.

The truly effective teacher, then, knows how to execute individual behaviors with a larger purpose in mind. This larger purpose requires placing behaviors in sequences and patterns that accumulate to create an effect greater than can be achieved by any single behavior or small set of behaviors. This is why teaching involves a sense of timing and pacing that cannot be conveyed by any list of behaviors. The interrelationships among these behaviors, giving each its proper emphasis in the context of your classroom, are important to the effective teacher. And it is the combination of curriculum, learning objectives, instructional materials, and learners that provides the context for the proper blend.

Professional Teaching Standards

The effective teaching methods described in this book draw on more than 30 years of research on effective teaching and on national and state standards for the teaching profession that have been closely aligned with current views of how and what students and teachers should learn.

For decades, American teaching reflected a direct instruction model. Teachers were expected to present or transmit knowledge to students, who were expected to receive, store, and return that knowledge upon request (Weiss & Weiss, 1998). Many researchers and educators have challenged this view, suggesting that learners do not simply receive knowledge; rather, they actively construct knowledge through interacting with the social, cultural, and linguistic context in which an experience occurs (Chaille, 2007; Fosnot, 2005; Phillips, 2000; Richardson, 1997). Effective teachers function as able facilitators, coaches, and guides for students' knowledge-building processes. In other words, students can be taught to become agents of their own learning.

Reflecting this more interactive view of teaching, the National Board for Professional Teaching Standards (NBPTS) was formed in 1987 with the goal of achieving three major outcomes:

1. To establish high and rigorous standards for what effective teachers should know and be able to do
2. To develop and operate a national, voluntary system to assess and certify teachers who meet these standards

3. To advance related education reforms for the purpose of improving student learning in American schools

Governed by a board of directors, the majority of whom are classroom teachers, the NBPTS (2001) lists five propositions essential to accomplished teaching:

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students.
3. Teachers are responsible for managing and mentoring student learning.
4. Teachers think systematically about their practice and learn from experience.
5. Teachers are members of learning communities.*

During the same year (1987), the Interstate New Teacher Assessment and Support Consortium (INTASC) was formed to create "board-compatible" standards that could be reviewed by professional organizations and state agencies as a basis for licensing beginning teachers. The **INTASC standards** (Miller, 1992) are written as 10 principles, which are then further explicated in terms of teacher knowledge, dispositions, and performances—in other words, what a beginning teacher should know and be able to do.

Because you will probably work with the INTASC standards during your professional development program (and perhaps with the NBPTS standards for advanced certification later in your career), this text discusses research-based practices used by effective teachers to achieve the INTASC and NBPTS standards. At the end of each chapter are test preparation exercises aligned with these standards to help you prepare for licensure examination. The end-of-chapter case histories and web-based self-assessments on MyEducationLab provide a targeted rehearsal preparing you for the level of pedagogical knowledge that may be expected of you at the end of your teacher preparation program and for teacher certification and licensing.

Here are the 10 INTASC standards written as principles, which can be accessed with the full document at www.ccsso.org/intascst.html. Each standard has been tagged with the chapters and appendices in this text that will provide you with the effective teaching methods for attaining them.

1. *Principle 1:* The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students. [Chapters 1, 3, 4]
2. *Principle 2:* The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development. [Chapters 2, 3, 4, 11]
3. *Principle 3:* The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners. [Chapters 7, 8, 10, 11]
4. *Principle 4:* The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills. [Chapters 8, 9, 10, 11, 12 and Appendix B]
5. *Principle 5:* The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation. [Chapters 2, 10, 11]
6. *Principle 6:* The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom. [Chapters 7, 8, 9, 10]
7. *Principle 7:* The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals. [Chapters 2, 3, 4]

8. *Principle 8:* The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the learner. [Chapter 12]
9. *Principle 9:* The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally. [Chapters 1, 4, 5, 6, 12 and Appendix A]
10. *Principle 10:* The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well-being. [Chapters 2, 5]

These principles require teachers to be able to integrate knowledge of subject-matter content, students, and the community in order to relate classroom objectives to the lives of learners. They also require the application of research-based principles of effective teaching that not only define what teachers need to know but also how to apply what they know in culturally rich and diverse classrooms.

This book devotes chapter content to each of these dimensions of effective teaching. Within each chapter, you will find teaching methods, examples, research, and a test preparation scenario to help you better integrate and implement these key principles of teaching in your classroom.

YOUR TRANSITION TO THE REAL WORLD OF TEACHING

Go to Topic 1: "Schools and Teaching Today" in the MyEducationLab for your course, where you can apply and practice your understanding of the core teaching skills identified in this chapter with a Building Teaching Skills and Dispositions learning unit.

An important question for you as a prospective teacher is, What type of knowledge and experiences will be needed to pass successfully into the real world of teaching? The chapters ahead convey the types of knowledge you should move quickly up the hierarchy of knowledge and experiences that make an effective teacher. But before learning about the tools and techniques that will help you progress up this hierarchy, you should reflect on your own concerns about teaching at this point in your career.

Appendix A contains the Teacher Concerns Checklist, a 45-item, self-report instrument for assessing the stages of concern with which teachers, like yourself, most strongly identify at different periods in their careers. Using the Teacher Concerns Checklist, rank your own level of teaching concerns and, using the instructions provided, express the concerns with which you identify most closely. Then return to this chapter and read further to learn more about this interesting facet of your growth and development as a teacher.

Stop now and complete the Teacher Concerns Checklist in Appendix A.

Now that you have ranked your most important teaching concerns, let's see what it means for your teaching. Your transition to the real world of teaching will usher in the first stage of teacher development, sometimes called the *survival stage* (Borich, 1993; Borich & Tombari, 1997; Burden, 1986; Fuller, 1969; Ryan, 1992). The distinguishing feature of this first stage of teaching is that your **teaching concerns** and plans focus on your own well-being more than on the teaching task or your learners. Bullough (1989) has described this stage as "the fight for one's professional life" (p. 16). During it, your concerns typically are focused on the following:

- Will my learners like me?
- Will they listen to what I say?
- What will parents and other teachers think of me?
- Will I do well when I'm being observed?

Typically during this time, behavior management concerns become a major focus of your planning efforts. For most teachers, survival, or *self,* concerns begin to diminish rapidly

during the first months of teaching, but there is no precise time when they end. What signals their end is the transition to a new set of concerns and planning priorities. This new set of priorities focuses on how best to deliver instruction. Various labels have been used to describe this second stage, such as the *mastery stage of teaching* (Ryan, 1992), *consolidation and exploration* (Burden, 1986), and *trial and error* (Sacks & Harrington, 1982). Fuller (1969) has described this stage as one marked by concerns about the teaching *task*. At this stage, you are beginning to feel confident that you can manage the day-to-day routines of the classroom and deal with a variety of behavior problems. You are at the point where you now can plan your lessons without an exclusive focus on managing your classroom. Your planning turns instead toward improving your teaching skills and achieving greater mastery over the content you are teaching. Typically, your concerns during this stage are with the following:

- Where can I find individualized instructional materials?
- Will I have enough time to cover the content?
- Where can I get ideas for an interdisciplinary thematic unit?
- What is the best way to teach writing skills to a heterogeneous class?

The third and highest level of teacher planning is characterized by concerns that have less to do with management and lesson delivery and more with the impact of your teaching on learners. This stage of planning is sometimes referred to as the *impact stage*. At this stage, you will naturally view learners as individuals and will be concerned that each of your students fulfills her or his potential to learn. At this time, your principal concerns may include the following:

- How can I increase my learners' feelings of accomplishment?
- How do I meet my learners' social and emotional needs?
- What is the best way to challenge my unmotivated learners?
- What skills do my learners need to best prepare them for the next grade?

Fuller (1969) speculates that concerns for *self, task,* and *impact* are the natural stages that most teachers pass through, representing a developmental growth pattern extending over months and even years of a teacher's career. Although some teachers may pass through these stages more quickly than others and at different levels of intensity, Fuller suggests that almost all teachers can be expected to move from one to another, with the most effective and experienced teachers expressing student-centered (impact) concerns at a high level of commitment.

Fuller's concerns theory has several other interesting implications. A teacher might return to an earlier stage of concern—for instance, moving from a concern for students back to a concern for task as a result of having to teach a new grade or subject or moving from a concern for task back to a concern for self as a result of having to teach different and unfamiliar students. The second time spent in a stage might be expected to be shorter than the first.

Finally, the three stages of concern need not be exclusive of one another. A teacher could have concerns predominantly in one area while still having concerns at lesser levels of intensity in the other stages.

Record your scores on the Teacher Concerns Checklist that you have just completed, and compare them with your scores at the end of this course to find out in what direction your concerns may have changed.

FOR FURTHER INFORMATION

During the past decade, a number of national and state efforts—such as those by the National Council of Teachers of Mathematics (NCTM), the International Reading Association (IRA), and others—have sought to define the knowledge and performance for

students or teachers in particular subject areas. The Mid-continent Regional Educational Laboratory (McREL) has created a large database that synthesizes many of these efforts. Visit their website at www.mcrel.org to learn more about standards.

The following is a case history and test preparation exercise intended to help you prepare for the licensure exam, which may be required by your teacher preparation program and your state for certification and licensing. You will find similar case histories at the end of each chapter. Based on the objectives and content of the Praxis II:® Principles of Learning and Teaching exam and the INTASC and NBPTS standards, these in-depth case histories represent key concepts in the chapter. A short-answer question requiring analysis of the case history and discrete multiple-choice questions pertaining to typical licensure test content in this chapter are provided on MyEducationLab. (See Figure 1.1 for the composition of the Praxis II®.) When you have completed the test preparation exercises, you will find a rubric and levels of scored student responses for the short-answer question (to help you understand the reasoning behind the score given to each short-answer response), the correct answer and an explanation for each multiple-choice question, and additional questions pertaining to licensure test content. Although not intended as a comprehensive assessment of chapter content, these questions provide a targeted rehearsal for preparing you for the level of pedagogical knowledge and question formats that will be expected of you on the Praxis II exam and other exams that may be required at the end of your teacher preparation program.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 1 content. After reading the case history, go to Chapter 1 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Mrs. Travis teaches seventh-grade English to a class of 29 students. In this class, there is a balance of boys and girls from low to high performing. Several students are mainstreamed, a few have limited English-speaking skills, and several are designated gifted. The majority perform at the average level. This case focuses in particular on the following three students.

Brady is a mainstreamed special education student new to the district. Her official classification is "emotionally disturbed," but some of her standardized test scores—particularly those for reading comprehension and vocabulary—put her near the gifted level. Her assigned seat is in the rear corner of the classroom, and she seems to enjoy the detachment it offers. Much of the time, Brady is reading a novel; her current choice is Franz Kafka's *Metamorphosis.*

Dalia is an honor roll student whose high motivation and study habits, rather than her test scores, underlie her achievement. She is always the first to class and begins on the daily warm-up even before the bell rings. Dalia is painstaking about her writing and anxious to get everything right. Often she stays after class or school to ask additional questions about an upcoming assignment. She is intent on becoming the first of her family to go to college.

Jim, an average student, is tall and outgoing and very excited that he has made the school football team. He has a good sense of humor and often jokes with fellow

▶

classmates. Although he has good attendance and is never late for class, his study habits are not very good. Sometimes he forgets his book or brings the wrong notebook, which he often uses as an excuse to "take the day off." And when he is on task, he often talks without raising his hand or interrupts other students in a burst of enthusiasm.

During the first several minutes of class, Mrs. Travis takes the roll while the class completes its usual warm-up, writing down the quote of the day, looking up synonyms for key underlined words, and finally paraphrasing the quote. Students also copy the daily lesson and homework assignment from the front board. A few students who have been absent go to the class calendar on the bulletin board to learn about makeup assignments.

Mrs. Travis asks Jim to read the quote: "The roots of education are bitter, but the fruit is sweet. Aristotle."

Jim reads from the board rather than his notebook, which he has forgotten today. Since he has not written down a synonym for the word *roots,* Mrs. Travis waits for him to look one up in the thesaurus. Jim takes his time but finally says "Base."

"That's a good choice," Mrs. Travis tells Jim. While she calls on others, she quietly slips Jim a blank page and suggests he write down the warm-up now so he can transfer it to his notebook at home. She remains standing next to his desk as she asks for more synonyms from the class. Reluctantly, Jim begins to write.

Throughout the discussion of the quotation, Brady has been reading her novel. When Mrs. Travis asks her to read her paraphrase of the quote, she replies without hesitation: "The underlying foundation of learning can be difficult or harsh, but the rewards are immense and joyous." Brady is about to go back to her book, but Mrs. Travis probes.

"Can you give some examples of those 'bitter roots,' Brady?"

"Well, having to do lesson warm-ups, for example, keeping a notebook, and putting up with someone who can hardly read." She stares at Jim.

Mrs. Travis admits that schoolwork can be difficult. "Those are some examples, Brady. Now tell us about some of the 'sweet fruit.'"

There is no reply. After about 10 seconds, Mrs. Travis probes, "Is reading a Kafka book sweet fruit?"

Brady responds with only a shrug. Mrs. Travis continues, "Well, if you like *The Metamorphosis,* I'd recommend you read *The Judgment* next." Brady looks up from her reading and stares at Mrs. Travis, a look of surprise stamped on her face. Then she writes down the title on her hand.

After a discussion, the class gives several examples of the "bitter roots" of education they would rather do without. The examples of the "sweet fruits" are a little more difficult to elicit, so Mrs. Travis changes gears.

"Well, maybe now you don't see too much 'sweet fruit' because you are in the midst of it, but what about when you graduate from high school or college? What rewards will your education provide?"

"I want to be first in my family to go to college," Dalia says.

"I'm going to get a football scholarship," adds Jim. Several others mention the cars they plan to buy when they finish their education. Just as the shared enthusiasm is on the edge of getting too noisy, Mrs. Travis directs students to a 10-minute writing assignment on today's lesson: The Rewards of Education.

For the next 10 minutes, students write while Mrs. Travis walks around the room to monitor their progress and make suggestions. Even Brady lays aside the novel she has been reading to write.

SUMMING UP

This chapter introduced you to definitions of effective teaching and key behaviors that help achieve it. The main points in this chapter include the following:

What Is an Effective Teacher?

1. Early definitions of effective teaching focused primarily on a teacher's goodness as a person and only secondarily on his or her behavior in the classroom.
2. The psychological characteristics of a teacher—personality, attitude, experience, achievement, and aptitude—do not relate strongly to his or her behavior in the classroom.
3. Most modern definitions of effective teaching identify patterns of teacher–student interaction in the classroom that influence the cognitive and affective performance of students.
4. Classroom interaction analysis is a research methodology in which the verbal interaction patterns of teachers and students are systematically observed, recorded, and related to student performance.

Key Behaviors Contributing to Effective Teaching

5. Five key behaviors for effective teaching and some indicators pertaining to them are the following:
   - *Lesson clarity:* Logical, step-by-step order; clear and audible delivery free of distracting mannerisms
   - *Instructional variety:* Variability in instructional materials, questioning, types of feedback, and teaching strategies
   - *Task orientation:* Achievement (content) orientation as opposed to process orientation, maximum content coverage, and time devoted to instruction
   - *Student engagement:* Limiting opportunities for distraction and getting students to work on, think through, and inquire about the content
   - *Success rate:* An estimated 60% to 70% of time spent on tasks that afford moderate to high levels of success, especially during expository or didactic instruction

Some Helping Behaviors Related to Effective Teaching

6. Five helping behaviors for effective teaching and some indicators pertaining to them are the following:
   - *Using student ideas and contributions:* Using students' responses to foster the goals of the lesson and getting students to elaborate on and extend learned content using their own ideas, experiences, and thought patterns
   - *Structuring:* Providing advance organizers and cognitive or mental strategies at the beginning of a lesson and creating activity structures with varied demands
   - *Questioning:* Using both content (direct) and process (indirect) questions to convey facts and to encourage inquiry and problem solving
   - *Probing:* Eliciting clarification, soliciting additional information, and redirecting when needed
   - *Teacher affect:* Exhibiting vigor, involvement, excitement, and interest during classroom presentations through vocal inflection, gesturing, eye contact, and animation, all of which communicate a warm and nurturing relationship to the learner

Teaching Effectively with Diverse Learners and Content

7. The key behaviors—such as lesson clarity, instructional variety, and teacher's task orientation—appear to be consistently effective across all or most teaching contexts.
8. The helping behaviors—such as use of student ideas and contributions, structuring, and questioning—can be thought of as helping behaviors for performing the five key behaviors. These behaviors may be applied differently in helping lower- and higher-SES students achieve success and across areas of instruction, such as the teaching of reading and mathematics.

The Complexity of Teaching

9. Effective teaching involves the orchestration and integration of key and helping behaviors into meaningful patterns to create effective teaching practices.

Professional Teaching Standards

10. Governed by a board of directors, the majority of whom are classroom teachers, the National Board for Professional Teaching Standards (NBPTS) offers five propositions essential to effective teaching.
11. The Interstate New Teacher Assessment and Support Consortium (INTASC) standards are written as 10 principles, which are then further explicated in terms of teacher knowledge, dispositions, and performances—in other words, what a beginning teacher should know and be able to do.

Your Transition to the Real World of Teaching

12. Fuller (1969) postulates three stages of concerns through which teachers pass on the way to becoming a professional: concern for self, concern for the teaching task, and concern for their impact on learners.

KEY TERMS

Constructivist teaching strategies, 20
Engaged learning time, 12
Helping behaviors, 7
Instructional variety, 10
INTASC standards, 28
Key behaviors, 7
Lesson clarity, 8
Praxis, 3
Socioeconomic status (SES), 23
Student success rate, 13
Teacher-mediated dialogue, 16
Teacher task orientation, 10
Teaching concerns, 29

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. In the following list, write the number 1 beside each indicator that likely would appear in the early definition of effective teaching, based on the characteristics of a good person. Write the number 2 beside each indicator that likely would appear in the later definition of effective teaching, based on the psychological characteristics of teachers. Write the number 3 beside each indicator that likely would appear in the modern definition of effective teaching, based on the interaction patterns of teachers and students.

_____ Is always on time for work
_____ Is intelligent
_____ Stays after class to help students
_____ Works well with those in authority
_____ Has plenty of experience at his or her grade level
_____ Varies higher-level with lower-level questions
_____ Likes his or her job
_____ Uses attention-getting devices to engage students in the learning task
_____ Is open to criticism
_____ Shows vitality when presenting
_____ Has worked with difficult students before
_____ Always allows students to experience moderate to high levels of success
_____ Matches the class content closely with the curriculum guide

2. In your opinion, which of the following helping behaviors on the right would be most helpful in implementing the key behaviors on the left? More than a single helping behavior may be used for a given key behavior. Compare your results with those of a classmate, and discuss the reasons for any differences.

1. _____ Lesson clarity	a. Student ideas
2. _____ Instructional variety	b. Structuring
	c. Questioning
3. _____ Task orientation	d. Probing
4. _____ Engagement in the learning task	e. Enthusiasm
5. _____ Success rate	

3. Identify two behaviors for effective teaching that you would emphasize if you were teaching fifth-grade mathematics. Identify two you would emphasize when teaching fifth-grade reading. Justify your choices using the summary research tables in this chapter.
4. Indicate your perceived strengths in exhibiting the five key and five helping behaviors, using the following technique. First, notice the number assigned to each of the key behaviors:

1 lesson clarity
2 instructional variety
3 teacher task orientation
4 student engagement in the learning process
5 student success rate

Now for each of the following rows of numbers listed, circle the number representing the key be-

havior in which you perceive yourself to have the greater strength:

1 versus 2	2 versus 4
1 versus 3	2 versus 5
1 versus 4	3 versus 4
1 versus 5	3 versus 5
2 versus 3	4 versus 5

Count how many times you circled a 1, how many times you circled a 2, and so on, and write the frequencies on the following lines:

_____ 1
_____ 2
_____ 3
_____ 4
_____ 5

Your perceived greatest strength is the key behavior that has the highest frequency. Your perceived least strength is the key behavior with the lowest frequency.

5. Repeat the paired comparison technique (see item 4) in the same manner for the five helping behaviors.

1 use of student ideas
2 structuring
3 questioning
4 probing
5 enthusiasm

1 versus 2	2 versus 4
1 versus 3	2 versus 5
1 versus 4	3 versus 4
1 versus 5	3 versus 5
2 versus 3	4 versus 5

_____ 1
_____ 2
_____ 3
_____ 4
_____ 5

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

1. Recall a particularly effective teacher you had during your high school years—and a less effective one. Try to form a mental image of each teacher. Now rate each teacher on the five key behaviors in the following list. Use 1 to indicate strength in that behavior, 2 to indicate average performance, and 3 to indicate weakness in that behavior. Are the behavioral profiles of the two teachers different? How?

Behavior	Teacher X (more effective)	Teacher Y (less effective)
Lesson clarity	_____	_____
Instructional variety	_____	_____
Task orientation	_____	_____
Engagement in the learning process	_____	_____
Success rate	_____	_____

2. Now rate the same two teachers across the five helping behaviors. Is the pattern the same? What differences in ratings, if any, do you find across key and helping behaviors for the same teacher? How would you account for any differences that occurred?

Digital Portfolio Activities

The following digital portfolio activities relate to INTASC principle 9:

- *What is a digital portfolio?* A digital portfolio contains the same materials that are placed in a traditional portfolio, but the materials are captured, organized, saved,

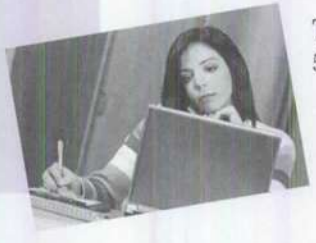
and presented in a digital format. There are many advantages to being able to save and present important information relevant to your professional development in a digital format. First, a digital portfolio of your professional development can contain all the entries you might want to show a prospective employer in a fraction of the space that an accordion file, file box, or even binder would consume. Second, it can provide immediate access to exactly what you need at the time you need it to respond to a specific request for information without your having to clumsily rummage through reams of information. And, third, it can place audio, video, graphics, as well as text at your fingertips in seconds. Accessibility, ease of duplication, minimal storage space, and portability make a digital portfolio the most advanced and efficient means of saving and displaying your professional accomplishments. Each chapter of this text will suggest what you should consider placing in your digital portfolio to present your professional skills and experiences and start you toward your first teaching job.

- *How do I start a digital portfolio?* You can start your digital portfolio using your personal computer and commonly available software, such as Microsoft PowerPoint. However, using any of several software applications for a professional portfolio, as identified by Costantino, De Lorenzo, and Tirrell-Corbin (2008) and Adams-Bullock and Hawk (2010), can make the task even easier.

Now here are some suggestions for creating your first portfolio entries that relate to INTASC principle 9:

1. This activity is designed to give you experience in creating a 2-minute video in which you state your philosophy of teaching—often required for your first job interview. This will give you the opportunity of establishing an introduction to yourself on your laptop to show the person interviewing you, rather than having to speak unrehearsed at what might be a stressful moment. You will need an inexpensive web camera, which will come with appropriate software. You may want to write out your 2-minute talk and use it as a guide to what you will say extemporaneously. Your objectives are to look natural and relaxed, to speak clearly, and to look directly into the camera. View your first trial and repeat the process as necessary until you give a confident picture of yourself. If you do not have the opportunity to use a web cam, write a statement and place it in a binder, box file, or accordion file. Also save this statement in a folder on your computer labeled "Teaching Philosophy."
2. Complete the Teacher Concerns Checklist in Appendix A, if you have not already done so. Set up and date a new computer folder with the name "Teacher Concerns," and place it in a file with your scores for concerns for self, concerns for task, and concerns for impact. As your professional experience grows, retake the Teacher Concerns Checklist (for example, at the end of this course and occasionally thereafter) and place your new scores for these dimensions side by side with your previous scores. Over time, note how your scores shift from self concerns to concerns for the teaching task and finally to concerns about your impact on students.

Classroom Observation Activities



The following classroom observation activities relate to INTASC principles 5, 6, and 8:

1. To gain a sense of the pace of teacher–student interactions in a classroom, arrange to observe in a classroom where there is likely to be some teacher–student dialogue (such as questions and

answers, discussion, oral checking, and feedback). To record your classroom observation, go to Chapter 1 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 1.1. This activity may also be completed by viewing a video of a classroom lesson, which may be available from your instructor or selected from among the Video Examples on MyEducationLab.

A. Be prepared to divide your observation time into three equal parts (for example, three 20-minute segments). During the first 20 minutes, count the number of teacher-to-student and student-to-teacher interchanges that occur, and record each occurrence with a tally mark in the appropriate box. A teacher question addressed to a student would count as one tally, for instance, and a student response to the teacher would count as another.
B. During the next 20-minute segment of your observation, continue observing teacher–student interaction, but this time, record the number of student-to-teacher and teacher-to-student exchanges that pertain to (a) lesson content, (b) procedural matters (directions and clerical tasks), and (c) discipline or classroom management (restating rules, giving warnings, or assigning punishment). Use Classroom Observation Activity 1.1 to tally the number of teacher–student exchanges in each of these areas during this part of your observation.
C. During the last 20 minutes of your observation, continue observing teacher–student interactions. This time, record your tallies according to whether the exchange is brief (lasting approximately 5 seconds or less) or extended (lasting more than 5 seconds), using the boxes provided. Include the complete exchange as a single tally. That is, record the teacher-to-student statement and the student response to the teacher (if applicable) as a single unit.

After recording your observations, state three general conclusions about the pace of activity in this classroom supported by the data you have collected in each of the three boxes. Begin building your digital portfolio by placing your tallies from each of the three boxes along with your general conclusion into a folder labeled "Classroom Observations" for your digital portfolio.

2. To reflect on the classroom you have just observed, go to Chapter 1 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 1.2. This observation instrument will ask you to rate your classroom according to its lesson clarity (clear/unclear), instructional variety (varied/static), teacher's task orientation (focused/unfocused), student engagement in learning (involved/uninvolved), and student success (high/low). How typical do you feel your ratings are of this teacher's lessons throughout the year? Why? Place a copy of the completed rating scale in the "Classroom Observation" folder of your digital portfolio.

2

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. What is a reflective teacher?
2. What is differentiated instruction?
3. What are some of the ways I can adapt my teaching to special populations of learners?
4. How can I use peer-group membership to foster the goals of my instruction?
5. How can I help my learners acquire a positive self-concept?
6. What are some ways I can promote family–school partnerships in my classroom?

INTASC

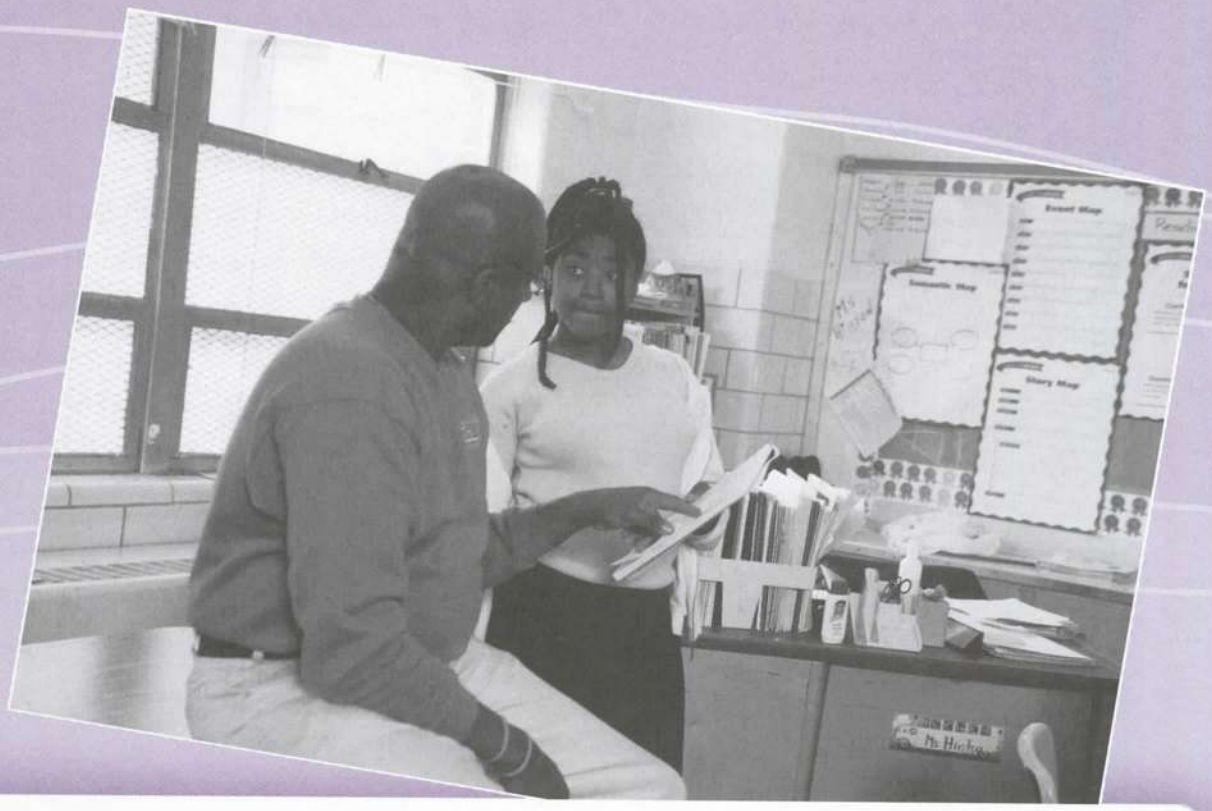
principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.

principle 3 The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.

principle 5 The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.

principle 9 The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

Understanding Your Students



Chapter 1 explained that teaching is not simply the transmission of knowledge from teacher to learner but rather is the interaction of teacher with learner. This chapter discusses the decisions you must make about whom you will teach. In subsequent chapters, we will consider the decisions you must make about what and how you will teach.

Not so long ago, students were viewed as empty vessels into which the teacher poured the contents of the day's lesson. Teachers perceived their task to be the skilled transmission of appropriate grade-level content as it appeared in texts, curriculum guides, workbooks, and the academic disciplines.

Contradictions arose from such a simplistic definition of teaching and learning. For example, this definition could not explain why some students get poor grades and others good ones even when the teacher is skilled at transmitting the contents of the day's lesson. Nor could the definition explain why some students want to learn, whereas others do not even want to come to school; why some students do extra work and others do little at all; or why some students are actively engaged in the learning process while others are not.

These are just some of the individual differences that exist in every classroom and that can influence the outcome of your teaching, regardless of how adept you may be at transmitting

the contents of the day's lesson. Adapting your teaching to individual differences will require you to make many decisions about your learners that cannot be reduced to simple formulas or rules. It will require that you become a ***reflective teacher*** *(York-Barr, Sommers, Ghere, & Montie, 2006), which means you take the time to ask tough questions about the success of your teaching efforts and the individual differences among your learners.*

Reflective teachers are thoughtful and self-critical about their teaching. That is, they take the time necessary to adapt their lessons to their learners' needs, prior histories, and experiences and to analyze and critique the success of their lessons afterward.

To help adapt subject-matter content to the world of their learners, reflective teachers use their learners' prior experiences and what they already know as instructional tools. By deemphasizing lecturing and telling, reflective teachers encourage their learners to use their own experiences to actively construct understandings that make sense to them and for which they can take ownership. In other words, reflective teachers bridge the gap between teaching and learning by actively engaging students in building lesson content and encouraging them to gradually accept greater responsibility for their own learning.

In the chapters ahead, we will have more to say about how you can become a reflective teacher who adapts subject matter to the individual differences of learners in the heterogeneous classroom and who uses student experiences and the dialogue of the classroom to actively engage students in the learning process. In this chapter, we provide some important facts about the special needs of your learners that will help you understand and appreciate their individual differences and adapt your instruction to them.

NOT ALL LEARNERS ARE ALIKE

Any observer in any classroom will quickly notice that schoolchildren vary in experience, socioeconomic status (SES), culture and ethnicity, language, and learning style. In addition, many classrooms have learners with disabilities, representing **special populations,** that without the teacher's help could have limited academic success. As a general education teacher, the Individuals with Disabilities Education Improvement Act of 2004 requires you to actively contribute to the education of learners who have been identified as having physical, hearing, visual, mental, behavior, learning, communication, or other-health-impaired disabilities.

These special learner needs, differences in SES, culture/ethnicity, language, abilities, and learning style will influence what your students learn and what and how you teach (Banks, 1997; Banks & Banks, 2001, 2006; Dunn & Griggs, 1995). Of what consequence is such an obvious observation? After all, you must teach all the students assigned to you, regardless of their differences or special needs. Two of the reasons for being aware of individual differences and special needs among your learners are these:

1. By recognizing students' individual differences and special needs, you will be better able to help them use their own experiences and learning histories to derive meaning and understanding from what you are teaching. With that knowledge, you will be better able

to adapt your instructional methods to the learning needs of your students and employ different instructional methods with different learners.

2. When counseling students and talking with parents about the achievement and performance of your learners, you will be able to convey some of the reasons for their behavior. Understanding your students' individual differences and special learning needs can provide important information to parents, counselors, and other teachers when they wonder why, for instance, Jared is not learning, why Anita learns without studying, or why Angela does not want to learn.

Researchers have discovered that different instructional methods, when matched to the individual strengths and needs of learners, can significantly improve their achievement (Cronbach & Snow, 1981; Mayer, 1998, 2002; Tomlinson & McTighe, 2006). For example, student-centered discussions improve the achievement of highly anxious students by providing a more informal, nurturing climate, whereas teacher-centered lectures increase the achievement of low-anxiety students by allowing for a more efficient and faster pace. The linguistic approach to teaching reading results in higher vocabulary achievement for students high in auditory ability and who learn best by hearing, whereas the whole-word approach is more effective for students low in auditory ability and who learn best by seeing. Researchers have found that achievement can be increased when the instructional method favors the learners' favored modalities for learning (Cushner, McClelland, & Safford, 2008; D'Amico & Gallaway, 2008; Darling-Hammond & Bransford, 2005; Messick, 1995).

Adaptive Teaching

One approach to achieving a common instructional goal with learners whose individual differences—such as prior achievement, aptitude, or learning styles—differ is called **adaptive teaching.** Adaptive teaching techniques apply different instructional strategies to different groups of learners so the natural diversity prevailing in the classroom does not prevent any learner from achieving success. Two approaches to adaptive teaching have been reported to be effective (Corno & Snow, 1986). They are the remediation approach and the compensatory approach.

The Remediation Approach. The **remediation approach** provides the learner with the prerequisite knowledge, skill, or behavior needed to benefit from the planned instruction. For example, you might attempt to lower the anxiety of highly anxious students with a student-centered discussion before an important presentation, so the presentation will equally benefit all students. Or you might teach listening skills to students low in auditory ability before using a linguistic approach to reading, so both groups will profit equally from this instructional approach.

The remediation approach to adaptive teaching will be successful to the extent that the desired prerequisite information, skill, or behavior can be taught within a reasonable period of time. When this is not possible or represents an inefficient use of classroom time, the compensatory approach to adaptive teaching can be taken.

The Compensatory Approach. Using the **compensatory approach,** the teacher chooses an instructional method to compensate for the lack of information, skill, or ability known to exist among learners by altering the content presentation to circumvent a weakness and promote a strength. This is accomplished by using alternate modalities (pictures versus words) or by supplementing the content with additional learning resources (instructional games and simulations) and activities (group discussions or experience-oriented activities). Doing so may involve modifying the instructional technique to focus on known strengths. Techniques include the visual representation of content, using more flexible instructional presentations (films, pictures, illustrations), shifting to alternate instructional formats

(self-paced texts, simulations, experience-oriented workbooks), and using performance-based assessment procedures that might require students to respond orally or assemble a portfolio of experiences, ideas, and products pertaining to a topic. For example, students who are slower to develop their reading comprehension and lack a technical math vocabulary might be taught a geometry unit supplemented with visual handouts. Portraying each theorem and axiom graphically emphasizes the visual modality.

Benefits of Adaptive Teaching. Notice that adaptive teaching goes beyond the simple process of ability grouping, in which learners are divided into groups and then presented with approximately the same material at different rates. Some research suggests that differences in academic performance between high and low achievers may actually increase with the use of ability grouping by creating a loss of self-esteem and motivation for the low group (Slavin, 1991a).

Adaptive teaching, in contrast, works to achieve success with all students, regardless of their individual differences. It does so either by remediation (building the knowledge, skills, or abilities required to profit from the planned instruction) or by compensation (emphasizing instructional methods/materials that rely on learner abilities that may be more highly developed). Therefore adaptive teaching requires an understanding of your students' learning strengths and experience with regard to specific lesson content and the alternative instructional methods that can maximize their strongest receptive modalities (such as visual versus auditory; discussion versus presentation; student experience driven vs. text driven).

Some of the most promising instructional alternatives in adaptive teaching include the following:

- Cooperative grouping versus whole-class instruction
- Inquiry versus expository presentation
- Rule–example versus example–rule ordering
- Teacher-centered versus student-centered presentation
- Direct versus indirect instruction
- Examples from experience versus examples from text
- Group phonics versus individualized phonics instruction
- Individual responses versus choral responses
- Subvocal responses versus vocal responses
- Self-directed learning versus whole-group instruction
- Computer-driven text versus teacher presentation

Each of these teaching methods has been found more effective for some types of learners than for others. The research literature and curriculum texts in your teaching area offer many examples of specific content areas in which a particular instructional method—in association with a particular student characteristic—has enhanced student performance. However, your classroom experience will suggest many other ways in which you can alter your teaching to fit the individual needs of your learners. By knowing your students and by having knowledge of a variety of instructional methods, you can adapt your instruction to the learning needs of your students.

Differentiated Instruction

A related approach to responding to your learners' individual differences is called **differentiated instruction.** While the methods of adaptive teaching can be effective in responding to the whole class or groups of learners in the same classroom who may differ, for example, in English proficiency, number skills, or task-relevant prior knowledge, differentiated instruction focuses on the academic success of individual learners or small groups of learners. Although similar to models of adaptive teaching in overall theory, differentiated instruction is based on the premise that instructional approaches should also vary according to the individual whose academic success is or could be enhanced by a more targeted and individualized

approach. To differentiate instruction is to recognize an individual student's learning history, background, readiness to learn, interests, and acquired skill set and then choose instructional strategies more tailored to a small group or an individual learner to speed academic success, which might be slowed if only large-group instruction is available. The goal of differentiated instruction, therefore, is to maximize each student's personal growth and academic success by meeting each student at his or her individual level and providing the needed instruction and resources to lift him or her to the next step on the learning ladder.

Tomlinson (2004) identifies three elements of the curriculum—content, process, and products—that can be differentiated to make instruction more responsive to the individual needs of learners:

1. *Content.* Differentiation can take the form of varying the modalities in which students gain access to important learning, for example, by (a) listening, reading, and doing; (b) presenting content in incremental steps, like rungs on a ladder, resulting in a continuum of skill-building tasks; and (c) offering learners a choice in the complexity of content with which they will begin a learning task that matches their current level of understanding and from which every learner can experience academic success.
2. *Process.* Differentiation takes the form of grouping flexibly, for example, by (a) varying from whole class, to collaborative groups, to small groups, to individuals and (b) providing incentives to learn based on a student's individual interests and current level of understanding.
3. *Products.* Tomlinson suggests varying assessment methods by (1) providing teachers a menu of choices that may include oral responses, interviews, demonstrations and reenactments, portfolios, and formal tests; (2) keeping each learner challenged at his or her level of understanding with content at or slightly above his or her current level of functioning; and (3) allowing students to have some choice in the means in which they may express what they know—for example, writing a story, drawing a picture, or telling about a real-life experience that involves what is being taught.

But most important, differentiated instruction provides the opportunity for the teacher to consider multiple characteristics of the learner *simultaneously* in choosing an instructional strategy for a particular learner and learning objective. Therefore, differentiated instruction is ideally suited for a heterogeneous classroom, in which learning histories, learning styles, learner interests, and skills as well as disabilities representing special populations may impair learning. Overall, the goal of differentiated instruction is to give learners alternate paths with which to learn. Students working below grade level may be given resources that retrace major objectives that have already been taught, whereas learners above grade level may be asked to produce work that requires more complex and advanced thinking. By varying teaching strategies, the teacher makes sure that each student has the opportunity to learn in a manner compatible with his or her own learning strengths and preferences. The curriculum is no longer defined in terms of what a teacher will teach but rather in terms of what a student will be able to demonstrate.

We will have more to say about how to implement and manage a differentiated curriculum in your classroom in Chapter 4 on lesson planning. For now, see In Practice: Focus on Differentiated Instruction for an informative introduction to this teaching strategy.

Now let's look at some of the individual differences that can influence your students' learning and your teaching.

The Effects of Individual Differences

One thing everyone remembers about elementary school is how some students seemed to learn so easily while others had to work so hard. In high school, the range of student

IN PRACTICE

FOCUS ON DIFFERENTIATED INSTRUCTION

A seventh grade boy spends his time in English class struggling to read at a beginner's level. A girl at a nearby desk with her nose in the book could probably tackle a Harvard literature class. Seated in between is a youngster who's a whiz at math but takes a whole period to write three English sentences because he's much more comfortable in his native Spanish.

That's diversity, as any educator knows, and—in one form or another—it's always been a part of American education.

"In the United States our goal is to educate all comers," says Dr. Carol A. Tomlinson, a 20-year veteran of the classroom now at the University of Virginia's Curry School of Education—and a proponent of mixed-ability classrooms.

Many other countries cull the academic haves from the have-nots at various rungs on the education ladder. Not so in the U.S., where the question of how teachers can successfully work with students of widely differing abilities, preparation, and home lives in the same classroom is here to stay.

Teachers have faced this dilemma since the days of the one-room schoolhouse, which mixed 6- to 16-year-olds in the same space. A solution then and now, say Tomlinson and many educators, is differentiation. It's a buzzword that's seen a thousand iterations, from SRA reading kits to placing kids in the bluebird or buzzard reading group. It's also a philosophy that sends shudders down the spines of some parents and others who doubt children can reach their highest potential in heterogeneous classrooms.

Understanding the roots of the skepticism, Tomlinson says our schools go through cycles, sometimes dealing with differences inside the classroom and other times shuttling youngsters—often the troublemakers, learning disabled and the gifted—"down the hall." The pull-outs then get labeled "discriminatory" or "elitist," depending on the group served, and the cycle begins again.

"But our choice isn't between sending them down the hall or doing nothing," Tomlinson argues. "We can differentiate in the regular classroom."

What true differentiation first requires, she says, is the realization that all learners vary in their readiness, interests, and learning profiles. Jumping off from this point, teachers can set up classrooms where everybody works toward essential understandings and skills, but uses different content, processes, and products to get there. Differentiation is all about options, she adds, and not about being punitive by just piling on additional work for the more able.

"Differentiation calls on us to make big leaps in the way we think about the classroom and the curriculum," says Tomlinson, who's seen this kind of instruction work from kindergarten through high school. "It takes a willingness to be a teacher who partners with kids in teaching and learning—who's more of a facilitator than a dictator. It challenges the sense that the curriculum is just coverage of facts."

Teachers Can Benefit

NEA member Denise DeFiore, interdisciplinary resource teacher at a new middle school in Silver Spring, Md. using differentiation, says kids aren't the only ones who reap benefits from this kind of instruction.

"It's more engaging for the teacher, too. It takes a different kind of energy than direct instruction," she said.

The bulk of the work is in upfront planning, DeFiore says, which often involves designing a tiered lesson plan. "You have to think about the outcome—and how you will get them all there on different paths." That might involve enlisting the help of the media specialist and computer teacher, or perhaps bringing in community resources.

An elementary and middle school teacher for 12 years, DeFiore says most of her training in differentiation has been "on the job." Preservice exposure is hit or miss, agrees Tomlinson, offering one possible explanation: "Young teachers are developing the gross motor skills of teaching. Differentiation is a fine motor skill. The way to get there is to teach them to look at kids as individuals and to let kids show you what they can do. We want young teachers to develop the right set of habits that will lead to differentiation. In truth, differentiation probably calls for an expert teacher."

With those years in the classroom behind her, DeFiore now finds that she can write most lessons as open-ended, letting students "go as far as they want." Experience has taught her that children need varying degrees of structure. "Some will take off; others need the lesson broken down into small steps."

How Differentiation Works

Sound too chaotic, time-consuming or just plain pie-in-the-sky? "Anything that's worth doing is complicated,"

answers Tomlinson, who says we're way past the point when a patchwork quilt of "flavor-of-the-month" fads was expected to address classroom diversity. "Differentiation can work—at all age levels."

How? In classrooms where it's alive and well, teachers like DeFiore:

- Keep the focus on concepts, emphasizing understanding and sense-making, not retention and regurgitation of fragmented facts.
- Use ongoing assessments of readiness and interests, and pre-assess to find students needing more support and those who can leap forward. They don't assume all students need a certain task.
- Make grouping flexible. They let students work alone sometimes and also in groups based on readiness, interests, or learning styles. They use whole-group instruction for introducing ideas, planning, or sharing results.
- See themselves as a guide. They help students set goals based on readiness, interests, and learning profiles—and assess based on growth and goal attainment.

Although many argue the pros and cons of differentiation, there's no dispute that successful implementation requires significant staff development. NEA member Judy Hart, acceleration and enrichment coordinator for the school district in Geneva, Ill., is on the front lines every day, helping teachers put differentiation into practice.

It's not a lack of desire on the part of teachers, she says, but a time issue. "Differentiation is a wonderful concept if you supply staff development. But to leave teachers high and dry—they're dying out there with so many things on their plate."

Hart, who also works as a private consultant doing summer staff development workshops around the country, says she sees a movement away from tracking and toward mixed-ability classrooms. Yet, she adds, if the training isn't there or is only a "one-shot deal," teachers tend to aim instruction toward the middle range. "Then two-thirds of the kids aren't getting anything."

Hart urges teachers overwhelmed by the logistics of differentiating to take small steps. "Pick one strategy for one class or even for one youngster, and dive in. With continued support, your confidence and skill will grow."

While conducting staff training nationwide, Tomlinson also finds that it's an evolutionary process: "Teachers are at different points in their professional journey, and we need to accommodate them."

She calms the apprehensive by suggesting they initiate differentiated instruction in a cumulative way, noticing a change over a school year. Teachers have told her, "Thanks for giving me permission to do this at a pace I can handle." Tomlinson takes pride in converting skeptics who try it once, see it catch on, and say they'll try it again.

Her message during training is clear: There's no point in differentiating instruction unless you're beginning with instruction that ranks as best practice. "The starting point is what you need to do to challenge the highly able student. What you're then doing is insuring that all kids get the best-practice instruction. Whenever you have teachers doing that, it reshapes how they teach all kids."

Tomlinson says teachers need to envision their classroom as an "escalator" going higher and higher, not as a "stairwell" that takes students to a certain grade-level landing where they stop. Tasks have to be "respectful of kids, hands-on, engaging and thought-provoking."

Source: "Although Some Voice Doubts, Advocates Say Differentiated Instruction Can Raise the Bar for All Learners," by Mary Anne Hess, NEA Communications and the Wisconsin Education Association Council (www.weac.org/Home/Parents_Community/differ.aspx)

ability seemed even greater. In a practical sense, we associate descriptors such as *smart, bright, able to solve problems, learns quickly,* and *can figure things out* with intelligence. Both in the classroom and in life, it seems that some have more ability than others. This observation often has been a source of anxiety, concern, and jealousy among learners. Perhaps because the topic of intelligence can so easily elicit emotions like these, it is one of the most talked about yet least understood aspects of student behavior.

One of the greatest misunderstandings that some teachers, parents, and learners have about intelligence is that it is a single, unified dimension. Such a belief is often expressed by the use of word pairs such as *slow/fast* and *bright/dull* when referring to different kinds of learners. Unfortunately, these phrases indicate that a student is either fast or slow,

bright or dull; in fact, each of us, regardless of our intelligence, may be all of these at one time or another. On a particular task of a certain nature, you may appear to be slow, but given another task requiring different abilities, you may be fast. How do such vast differences occur within a single individual?

Everyone knows from personal experience in school, hobbies, sports, and interpersonal relationships that the degree of intelligence depends on the circumstances and conditions under which the intelligence is exhibited. Observations such as this have led researchers to study and identify more than one kind of intelligence. This relatively new way of looking at intelligence has led to a better understanding of classic contradictions, like why Carlos is good in vocabulary but not in spelling, why Angela is good in social studies but poor at reading maps, and why Tamara is good at analyzing the reasons behind historical events but not at memorizing the names and dates that go along with them. Each of these seemingly contradictory behaviors can be explained by the special abilities required by each task. These specific abilities, in which we all differ, are the most useful aspects of intelligence for understanding the learning needs of your students.

Before turning to these specific abilities, you should be aware of some controversial issues about the use of general intelligence when discussing intelligence with parents, teachers, and school administrators. These issues often strongly divide individuals into two camps, known as the environmentalist position and the hereditarian position.

The Environmentalist Position

The **environmentalist position** criticizes the use of general ability tests in the schools in the belief that they are culturally biased. Environmentalists believe that differences in intelligence quotient (IQ) scores among groups such as African Americans, Hispanics, and Anglos can be attributed largely to social class or environmental differences. Environmentalists reason that some groups of students, particularly minorities, may come from impoverished home environments in which the verbal skills generally required to do well on intelligence tests are not practiced as much as in the general population. Therefore, a significant part of minority-student scores on any IQ test represents the environment in which they grew up, not their true intelligence.

Environmentalists conclude and some research suggests that the effects of the home and even the classroom environment can be as important as heredity in contributing to one's IQ (Bloom, 1981; Doll, Zucker, & Brehm, 2004; Sternberg & Grigorenko, 2001; Weinberg, 1989). This group believes intelligence tests are biased in favor of the middle class, who it is believed are able to provide their children with more intense patterns of verbal interaction, greater reinforcement for learning, more learning resources, and better physical health during the critical preschool years, when cognitive growth is fastest.

The Hereditarian Position

The **hereditarian position** concludes that heredity rather than environment is the major factor determining intelligence. Hereditarians base their beliefs on the research and writings of Herrnstein and Murray (1994) and Jensen (1969, 1998). They believe that not all children have the same potential for developing the same mental abilities. They contend that efforts such as compensatory education programs, which make up for environmental disadvantages in the early elementary grades through remediation, have limited success because the origin of the difference is mostly genetic and not environmental.

General versus Specific Intelligence

Common sense tells us there is some truth in both arguments. However, despite how parents, other teachers, and even your own students may feel, these positions are highly

Figure 3.4 A Taxonomy for Learning, Teaching, and Assessing

	The Cognitive Process Domain					
The Knowledge Dimension	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. *Factual knowledge:* The basic facts that must be known within a discipline						
B. *Conceptual knowledge:* The interrelationships that function together to form a concept						
C. *Procedural knowledge:* How to apply skills, algorithms, techniques, and methods						
D. *Metacognitive knowledge:* Awareness and knowledge of one's own thinking						

Source: Adapted from *Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, by L. Anderson and D. Krathwohl (Eds.), 2001. New York: Longman.

Here are examples of receiving objectives that use these verbs:

- The student will be able to notice a change from small-group discussion to large-group lecture by following the lead of others in the class.
- The student will be able to listen to all of a Mozart concerto without leaving his or her seat.

Responding. Objectives at the responding level require the student to comply with given expectations by attending or reacting to certain stimuli. Students are expected to

Figure 3.5 Taxonomy of Educational Objectives: Affective Domain

Source: Based on Krathwohl et al., 1999.

IN PRACTICE

FOCUS ON THE NEW FIELD OF COGNITIVE SCIENCE

In this chapter, you have studied two taxonomies of objectives in the cognitive domain: one by Bloom and colleagues (1984), and another by Anderson and Krathwohl (2001). The development of these taxonomies represents a gradual shift from a *behavioral model*, which emphasizes how to arrange the learning environment to bring about desired outcomes (for example, through rewards and disincentives), to a *cognitive model*, which places more emphasis on how the brain functions during problem solving, decision making, creativity, and critical thinking and the cognitive strategies that promote these outcomes. Although both taxonomies consider the acquisition of knowledge to be important, Anderson and Krathwohl have extended Bloom's taxonomy to include the cognitive and metacognitive strategies that can help learners improve their thinking and more efficiently achieve higher-order outcomes. Much of what we know about the content of thinking and assessment today we owe to advances in the cognitive science of learning.

The Behavioral Model

B. F. Skinner, considered the founder of behaviorism, generated many of the experimental data that form the basis of behavioral learning theory. He and other behavioral theorists were concerned mainly with observable indications of learning and what those observations could imply for teaching. They concentrated on observable cause-and-effect relationships.

Skinner and other behaviorists view the teacher's job as modifying the behavior of students by setting up situations to reinforce them when they exhibit desired responses. Behaviorists see learning as a sequence of stimulus and response actions in the learner. They reason that teachers can link responses involving lower-level skills and create a learning "chain" to teach higher-level skills. The teacher determines all of the skills needed to lead up to the desired behavior and makes sure students learn them in a step-by-step manner (Roblyer, Edwards, & Havriluk, 1997, p. 59).

The Cognitive Model

Many educational psychologists, however, found the behavioral approach unsatisfying. In the areas of problem solving and learning strategies, they became more concerned with what was unobservable—what was going on inside the brain.

These cognitive theories are based on the work of educational philosopher John Dewey and educational psychologists Lev Vygotsky, Jean Piaget, and Jerome Bruner. They propose that children actively construct knowledge and that this construction of knowledge happens in a social context. Vygotsky proposed that all learning takes place in the *zone of proximal development*, which is the difference between what a child can do alone versus with assistance. By building on the child's experiences and providing moderately challenging tasks, teachers can provide the *intellectual scaffolding* to help him or her learn and progress through the different stages of development.

Whereas the behavioral approach to learning emphasizes how to establish a learning environment to produce more correct answers than incorrect ones, the cognitive approach emphasizes that good thinking results from studying the cognitive processes and outcomes that underlie right and wrong answers. Cognitive psychologists believe that learners, even at the earliest grade levels, have some knowledge about nearly every topic they study (Tombari & Borich, 1999, p. 7).

Closely connected to the cognitive approach are the methods of *constructivism*. These methods emphasize students' ability to solve real-life, practical problems. Students typically work in cooperative groups, rather than individually; they tend to focus on projects that require solutions to problems, rather than on instructional sequences that require learning certain content skills. The roles of the teacher in constructivist models are to arrange for required resources and act as a guide to students while they set their own goals and teach themselves (Roblyer, Edwards, & Havriluk, 1997, p. 70).

obey, participate, or respond willingly when asked or directed to do something. Here are some action verbs that describe outcomes at the responding level:

applaud	follow	play
comply	obey	practice
discuss	participate	volunteer

These are examples of responding objectives that use these verbs:

- The student will follow the directions given in the book without argument when asked to do so.
- The student will practice a musical instrument when asked to do so.

Valuing. Objectives at the valuing level require the student to display behavior consistent with a single belief or attitude in situations where he or she is neither forced nor asked to comply. Students are expected to demonstrate a preference or display a high degree of certainty and conviction. Here are some action verbs that describe outcomes at the valuing level:

act	debate	help
argue	display	organize
convince	express	prefer

Here are some examples of valuing objectives that use these verbs:

- The student will express an opinion about nuclear disarmament whenever national events raise the issue.
- The student will display an opinion about the elimination of pornography when discussing this social issue.

Organization. Objectives at the organization level require a commitment to a set of values. This level of the affective domain involves (1) forming a reason one values certain things and not others and (2) making appropriate choices between things that are and are not valued. Students are expected to organize their likes and preferences into a value system and then decide which ones will be dominant. Here are some action verbs that describe outcomes at the organization level:

abstract	decide	select
balance	define	systematize
compare	formulate	theorize

Examples of organization objectives that use these verbs include the following:

- The student will be able to compare alternatives to the death penalty and decide which ones are compatible with his or her beliefs.
- The student will be able to formulate the reasons she or he supports civil rights legislation and be able to identify legislation that does not support her or his beliefs.

Characterization. Objectives at the characterization level require that all behavior displayed by the student be consistent with his or her values. At this level, the student not only has acquired the behaviors at all previous levels but also has integrated his or her values into a system representing a complete and pervasive philosophy that does not allow contradictory expressions. Evaluations of this level of behavior involve the extent to which the student has developed a consistent philosophy of life (e.g., exhibits respect for the worth and dignity of human beings in all situations). Here are some action verbs that describe outcomes at this level:

avoid	internalize	resist
display	manage	resolve
exhibit	require	revise

Here are some example objectives:

- The student will exhibit a helping and caring attitude toward students with disabilities by assisting them both in and out of the classroom.
- The student will display a scientific attitude by stating and then testing hypotheses whenever the choice of alternatives is unclear.

The Psychomotor Domain

A third method of categorizing objectives has been devised by Harrow (1977) and by Moore (1992). Harrow's taxonomy delineates five levels of psychomotor behavior, ranging from the imitation level (least complex and least authentic) to the naturalization level (most complex and most authentic). Figure 3.6 illustrates the hierarchical arrangement of the psychomotor domain. These behaviors place primary emphasis on neuromuscular skills involving various degrees of physical dexterity. As behaviors in the taxonomy move from least to most complex and authentic, behavior changes from gross to fine motor skills.

Each of the levels—imitation, manipulation, precision, articulation, and naturalization—has different characteristics as described below.

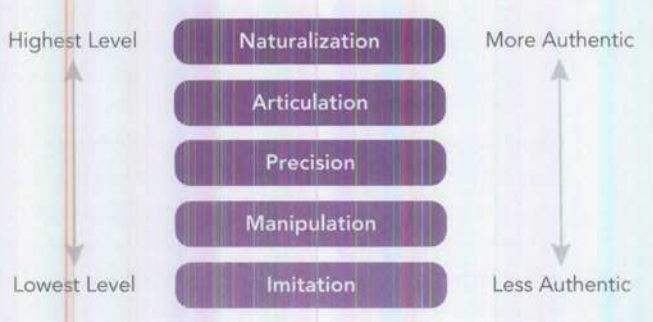
Imitation. Objectives at the imitation level require that the learner be exposed to an observable action and then overtly imitate it, such as when an instructor demonstrates the use of a microscope by placing a slide on the specimen tray. Performance at this level usually lacks neuromuscular coordination (e.g., the slide may hit the side of the tray or be improperly aligned beneath the lens). Thus the behavior generally is crude and imperfect. At this level, students are expected to observe and be able to repeat (although imperfectly) the action being visually demonstrated. Here are some action verbs that describe outcomes at this level:

align	grasp	repeat
balance	hold	rest (on)
follow	place	step (here)

Here are examples of imitation objectives that use these or similar verbs:

- After being shown a safe method for heating a beaker of water to boiling temperature, the student will be able to repeat the action.

Figure 3.6 Taxonomy of Educational Objectives: Psychomotor Domain



Source: Based on Harrow, 1972.

- After being shown a freehand drawing of a triangle, the student will be able to reproduce the drawing.

Manipulation. Objectives at the manipulation level require the student to perform selected actions from written or verbal directions without the aid of a visual model or direct observation, as in the previous (imitation) level. Students are expected to complete the action from reading or listening to instructions, although the behavior still may be performed crudely and without neuromuscular coordination. Useful expressions to describe outcomes at the manipulation level are the same as at the imitation level, using the same action verbs, except they are performed from spoken or written instructions.

Here are examples of some manipulation objectives:

- Based on the picture provided in the textbook, type a salutation to a prospective employer using the format shown.
- With the instructions on the handout in front of you, practice focusing your microscope until you can see the outline of the specimen.

Precision. Objectives at the precision level require the student to perform an action independent of either a visual model or written set of directions. Proficiency in reproducing the action at this level reaches a higher level of refinement. Accuracy, proportion, balance, and exactness in performance accompany the action. Students are expected to reproduce the action with control and to reduce errors to a minimum. Expressions that describe outcomes at this level include the following:

accurately	independently	with control
without error	proficiently	with balance

Here are some examples of precision objectives:

- The student will be able to place the specimen accurately on the microscope tray and use the high-power focus with proficiency, as determined by the correct identification of three out of four easily recognizable objects.
- The student will be able to balance a light pen sufficiently to place it against the computer screen to identify misspelled words.

Articulation. Objectives at the articulation level require the student to display coordination of a series of related acts by establishing the appropriate sequence and performing the acts accurately, with control as well as with speed and timing. These expressions describe outcomes at this level:

confidence	integration	speed
coordination	proportion	stability
harmony	smoothness	timing

Examples of articulation objectives include the following:

- Students will be able to write all the letters of the alphabet, displaying the appropriate proportion between uppercase and lowercase, in 10 minutes.
- Students will be able to complete 10 simple arithmetic problems accurately on a handheld electronic calculator quickly and smoothly within 90 seconds.

Naturalization. Objectives at the naturalization level require a high level of proficiency in the skill or performance being taught. At this level, the behavior is performed with the least expenditure of energy and becomes routine, automatic, and spontaneous. Students are expected to repeat the behavior naturally and effortlessly time and again. Here are some expressions that describe this level of behavior:

automatically	professionally	with ease
effortlessly	routinely	with perfection
naturally	spontaneously	with poise

Here are some examples of naturalization objectives:

- At the end of the semester, students will be able to write routinely all the letters of the alphabet and all the numbers up to 100, each time requested.
- After the first grading period, students will be able to automatically draw correct isosceles, equilateral, and right triangles, without the aid of a template, for each homework assignment that requires this task.

Some Misunderstandings About Behavioral Objectives

Before beginning to write objectives, you should be aware of several misconceptions about the cognitive, affective, and psychomotor domains. Following are some cautions to be mindful of when using behavioral objectives, each stated in the form of a question a parent or teacher may ask.

Are Some Behaviors More Desirable Than Others?

One misconception that often results from study of the cognitive, affective, and psychomotor domains is that simple behaviors, like the recall of facts and dates, are less desirable than more complex behaviors, requiring the cognitive operations of analysis, synthesis, and decision making. In fact, the simple-to-complex ordering of behaviors within the cognitive, affective, and psychomotor domains does not imply desirability, because many lower-order behaviors must be learned before higher-order behaviors can be attempted.

Some teachers pride themselves on preparing objectives almost exclusively at the higher levels of cognitive complexity. But objectives at lower levels of complexity often represent the knowledge base on which students build more complex behaviors. When the task-relevant prior knowledge or skills necessary for acquiring more complex behaviors have not been taught, students may demonstrate high error rates and less active engagement in the learning process at the higher levels of behavioral complexity (Alexander, 1996).

One of the most important uses of the taxonomies of behavior we have studied is to provide a menu of behaviors at different levels of complexity. As with any good diet, variety and proper proportion are the keys to good results.

What Is an Authentic Behavior?

Another misconception involves the meaning of the word *authentic,* which means "relevant to the real world." If a learner were only required to know the names of the presidents to complete a task or an assignment in the real world, that behavior could be measured authentically by asking him or her to memorize the names of the presidents, perhaps in the order in which they held office. Your measurement of this objective would be authentic because you would be asking that the behavior be displayed inside your classroom exactly as it would be performed outside. However, few occupations, courses, or programs of study will require your learners to recite the names of the presidents.

Knowledge (cognitive domain), receiving (affective domain), and imitation (psychomotor domain) are seldom sufficient in the world outside the classroom. Although they often are necessary in acquiring more complex behaviors, they are seldom important by themselves. However, behaviors representing higher cognitive skills often do take on

importance outside the classroom exactly as they are taught. Evaluation (cognitive domain), characterization (affective domain), and naturalization (psychomotor domain) are examples of such behaviors. Deciding which candidate to vote for, assuming the responsibility of an informed citizen, and being able to read and complete a voting ballot are all authentic behaviors because they are necessary performances in daily life, in contrast to being able to name all the presidents. Therefore, higher cognitive skills often are more authentic than lower cognitive skills because they represent more integrated behaviors necessary for living, working, and performing in the world outside your classroom. This is one of the best reasons for a "thinking curriculum," which teaches higher cognitive skills in your classroom. To help you create a thinking curriculum in your classroom, you will find in Appendix C the Higher-Order Thinking and Problem-Solving Checklist (Borich & Tombari, 2004). Use it to help you select and prioritize some of the authentic behaviors you want to teach and assess. Borich and Tombari (2004) provide specific examples of K–12 lesson content and objectives that illustrate higher-order thinking and problem-solving behaviors you can teach in your classroom. Write behavioral objectives for some of these behaviors, and you will be teaching a thinking curriculum.

Are Less Complex Behaviors Easier to Teach?

Another misconception is that behaviors of less complexity are easier to teach than behaviors of greater complexity. This is an appealing argument, because intuition tells us that this should be so. After all, complexity—especially cognitive complexity—often has been associated with greater difficulty, greater amounts of study time, and more extensive instructional resources.

Although simpler behaviors may be easier to teach some of the time, just the opposite can also be true. For example, consider the elaborate visual materials and mnemonic system that might be needed to recall a portion of the periodic table of chemical elements, as opposed to the simple demonstration that may be required to teach its application. In this case, the so-called less complex behavior requires greater time and instructional resources.

Whether a behavior is easier or more difficult to teach also will always depend on the learning needs of your students. Keep in mind then that the ease with which a behavior can be taught is not necessarily synonymous with the level of the behavior in the taxonomy. These designations refer to the mental, or cognitive, operations required of the student, not the preparation required of the teacher to assure that learners have attained the desired outcome.

myeducationlab
The Power of Classroom Practice

Go to Topic 5: "Instructional Planning" in the MyEducationLab for your course, where you can apply and practice your understanding of the core teaching skills identified in this chapter with a Building Teaching Skills and Dispositions learning unit.

Are Cognitive, Affective, and Psychomotor Behaviors Mutually Exclusive?

Categorizing behaviors into separate cognitive, affective, and psychomotor domains does not mean that behaviors listed in one domain are not needed for attaining those listed in other domains (Anderson & Krathwohl, 2001). For example, it is not possible to think without having some feeling about what we are thinking or to feel something without thinking, which means the affective and cognitive domains are intertwined. Also much thinking involves physical movements and bodily performances that require psychomotor skills and abilities. For example, conducting a laboratory experiment requires not only thinking about what you are doing but also pouring liquid from one test tube to another, safely igniting a Bunsen burner, or adjusting a microscope correctly. Similarly, legible handwriting requires neuromuscular coordination, timing, and control while you are thinking about what you are writing.

Although it is convenient for an objective to contain behavior from only one of the three domains at a time, keep in mind that including one or more behaviors from the other domains also may be required. This is one of the best reasons for preparing objectives in all three domains: It is evidence of your awareness of the close and necessary relationship among cognitive, affective, and psychomotor behaviors.

THE CULTURAL ROOTS OF OBJECTIVES

Finally, be prepared to have the source of your objectives questioned by parents, community members, and students. Some typical teacher responses to an inquiring parent question about the source of a lesson or unit objective may include "From the textbook, . . . curriculum guide, . . . or department policies . . ." Even though these answers are technically correct, they miss the fundamental point, which is that objectives have roots much deeper than any single text, curriculum guide, or set of policies. Their roots lie in the educational values we espouse as a nation. Although parents, students, and other teachers may argue with the text used, the curriculum guide followed, or the department policies adopted, it is quite another matter to take exception to the values we share as a nation and that were created by many different interest groups over years of thoughtful deliberation, such as the INTASC and NBPTS standards presented in Chapter 1.

Texts, curricula, and policies are interpretations of the values that are shared at the broadest national level and translated into practice through goals, standards, and objectives. Texts, curriculum guides, and school district policies can no more create objectives than they can create values. Standards and their objectives, as we have seen earlier in this chapter, are carefully created to reflect our values; sources include curriculum reform committees, state and national legislative mandates, and the professional associations to which you belong.

This is why you must have knowledge of these ultimate sources from which your objectives have been derived. Without it, you may continually be caught in the position of justifying a particular text, curriculum, or policy to parents, students, and peers—some of whom will always disagree with you. Reference to any one text, curriculum, or policy cannot prove that your students should appreciate art or know how to solve an equation. But our values—as indicated by curriculum reform committees, state and national mandates, and professional associations—can provide appropriate and adequate justification for your intended learning outcomes. Your attention to these values—as reported by professional papers and reports, curriculum committees, and national teacher groups—is as important to your teaching as the objectives you write.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 3 content. After reading the case history, go to Chapter 3 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Max is a prospective teacher in the last year of his program. Today he will be observing two science classes at a middle school.

Mr. Goldthorp's Science Classroom

Mr. Goldthorp's students are working quietly at their desks. They are in the middle of a 2-week field investigation unit devoted to identifying leaves. The directions for the unit are written on the handout Mr. Goldthorp has shared with Max.

Using the specimens available during school nature walks, as well as those close to home, the students will collect, identify, and label the leaves of 10 trees native to their area. Work is expected to be neat and accurate and completed in 10 school days.

Several students leave their desks to visit the "Reference" table, where books are available with colored pictures and detailed sketches of trees and leaves. Sometimes students help each other to decide among possible choices. Mr. Goldthorp encourages this informal cooperation and steps in with questions to guide students when needed.

Another table has a laminating machine. Aurora's eyes sparkle as she watches her dusty red oak leaf emerge, encased in shining plastic. Some students take their turns with the calligraphy pens available for labeling; others wait to use the computer to do the labeling. Four or five students make themselves comfortable on the carpet and pillow-lined library corner, where they leaf through an assortment of poetry books in hopes of finding "just the right poem" about nature to express their feelings about trees. If they recite a poem in front of the class, they can get up to 10 points of extra credit.

Mr. Gonzales's Science Classroom

Across the hall, Max sees that Mr. Gonzales is also working on a unit about nature. Over the past few days, his class has been discussing the deer problem that has made the local news. Recently, a woman was seriously injured when her car ran into a deer. One of the students in class knew the injured woman and brought the topic up during a class discussion about ecology. The passion the class generated was so intense that Mr. Gonzales abandoned his usual field investigation of local stream water purity and allowed students to pursue their interest in the deer problem.

Today during Max's observation, students are debating some of the proposals brought up in the newspaper and on the radio. Mr. Gonzales is at the board, writing down the ideas. He writes each idea in a column labeled "Positives" or a column labeled "Negatives."

The class is discussing a plan that would make it illegal for residents to feed deer. Susan is animated in her disapproval of such a law. She says, "Our country is founded on freedom and property rights. You should be able to feed deer on your own property without having to ask anybody's permission." Mr. Gonzales writes "Ignores freedom and property rights" in the "Negatives" column.

"It's because people treat them like pets that causes the accidents," Carmen blurts out before she remembers to raise her hand. She is the girl who knows the injured woman. After writing her idea in the "Positives" column, as a 'Safety concern," Mr. Gonzales hands out the following assignment:

> Using our class discussion, as well as ideas proposed in the newspaper or on the radio, write a proposal for dealing with the deer problem. You may combine the ideas we have read or talked about or come up with your own unique solution. Your proposal should be 300 to 400 words in length and be supported by sound reasons based on common sense and scientific principles. The final copy will be due in 3 days.

SUMMING UP

The main points in this chapter include the following:

Goals, Standards, and Objectives

1. *Goals* are expressions of societal values that provide a sense of direction broad enough to be accepted by large numbers of individuals.
2. *Standards* identify what will be learned from your instruction and energize and motivate you and your learners to achieve practical end products.
3. *Objectives* have two purposes: (1) to tie standards to specific classroom strategies that will achieve those standards and (2) to express teaching strategies in a

format that allows you to measure their effects on your learners.

4. When the word *behavioral* precedes the word *objective,* the learning is being defined as a change in observable behavior that can be measured within a specified period of time.
5. The need for behavioral objectives stems from a natural preoccupation with teacher concerns for self and task, sometimes to the exclusion of concerns for the impact on students.

Steps in Preparing Behavioral Objectives

6. Simply put, behavioral objectives do the following:
   - Focus instruction on a specific goal, whose outcomes can be observed.
   - Identify the conditions under which learning can be expected to occur.
   - Specify the level or amount of behavior that can be expected from the instruction under the conditions specified.
7. Action verbs help operationalize the learning outcome expected from an objective and identify exactly what the learner must do to achieve the outcome.
8. The outcome specified in a behavioral objective should be expressed as an end (e.g., to identify, recall, list) and not as a means (e.g., to study, watch, listen).
9. If the observable learning outcome is to take place with particular materials, equipment, tools, or other resources, these conditions must be stated explicitly in the objective.
10. Conditional statements within a behavioral objective can be singular (one condition) or multiple (more than one condition).
11. The conditions stated should match those under which the behavior will be performed in the real world.
12. A *proficiency level* is the minimum degree of performance that will satisfy you that the objective has been met.
13. Proficiency levels represent value judgments, or educated guesses, as to what level of performance will be required for adequately performing the behavior in some setting beyond your classroom.
14. The *expressiveness* of an objective refers to the amount of flexibility allowed in a response. Less expressive objectives may call for only a single right answer, whereas more expressive objectives allow for less structured and more flexible responses. The expressiveness allowed is always a matter of degree.

The Cognitive, Affective, and Psychomotor Domains

15. The *complexity* of a behavior in the cognitive, affective, or psychomotor domain pertains to the operations required of the student to produce the behavior, not to the complexity of the teaching activities required.
16. Behaviors in the cognitive domain, from least to most complex, are knowledge, comprehension, application, analysis, synthesis, and evaluation.
17. Behaviors in the affective domain, from least to most complex, are receiving, responding, valuing, organization, and characterization.
18. Behaviors in the psychomotor domain, from least to most complex, are imitation, manipulation, precision, articulation, and naturalization.

Some Misunderstandings about Behavioral Objectives

19. Four important cautions in using the taxonomies of behavioral objectives are as follow:
   - No behavior is necessarily more or less desirable than any other.
   - Higher-order cognitive skills often are more authentic than lower-order cognitive skills.
   - Less complex behaviors are not necessarily easier to teach, less time consuming to teach, or dependent on fewer resources than are more complex behaviors.
   - Behavior in one domain may require achievement of one or more behaviors in other domains.

The Cultural Roots of Objectives

20. Behavioral objectives have their roots in the educational values we espouse as a nation. Texts, curricula, and department and school policies are interpretations of these values shared at the broadest national level and translated into practice through behavioral objectives.

KEY TERMS

Affective domain, 92
Authentic behaviors, 94
Authentic tests, 94
Behavioral objective, 84
Cognitive domain, 92
Criterion level, 89
Declarative (factual) knowledge, 92
Expressive objective, 90
Goals, 80
Learning activities, 87
Learning conditions, 87
Learning outcome, 85
Metacognitive knowledge, 93
Objectives, 80
Performance assessments, 93
Procedural knowledge, 93
Psychomotor domain, 92
Standards, 80
Thinking curriculum, 82

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

1. Select one of the 10 INTASC principles identified in Chapter 1, and translate it into one or more objectives for your teacher preparation program. Make sure your objective is responsive to the principle from which it was derived.

*2. Identify the two general purposes for preparing behavioral objectives. If you had to choose one of these purposes as being more important to you, which would you choose? Why?

*3. Explain what three things the word *behavioral* implies when it appears before the word *objectives.*

*4. Identify three components of a well-written behavioral objective. Then give one example of each.

*5. Historically, why did the concept of behavioral objectives emerge?

*6. Why are action verbs necessary in translating goals such as producing *mentally healthy citizens, well-rounded individuals,* and *self-actualized schoolchildren* into learning outcomes?

*7. Distinguish learning outcomes (ends) from learning activities (means) by placing an O or A beside each of the following expressions:

Working on a car radio
Adding signed numbers correctly
Practicing the violin
Playing basketball
Using a microscope
Identifying an amoeba
Naming the seven parts of speech
Punctuating an essay correctly

*8. What is the definition of a condition in a behavioral objective. Give three examples.

*9. How can the specification of conditions help students study and prepare for tests?

*10. In trying to decide what condition(s) to include in a behavioral objective, what single most important consideration should guide your selection?

*11. What is the definition of *criterion level* in a behavioral objective? Give three examples.

*12. Group A below contains objectives. Group B contains levels of cognitive behavior. Match the levels in group B with the most appropriate objective in group A. Group B levels can be used more than once.

Group A: Objectives

_____ 1. Given a two-page essay, the student can identify the assumptions basic to the author's position.
_____ 2. The student will correctly spell the word *mountain.*
_____ 3. The student will convert the following English passage into Spanish.
_____ 4. The student will compose new pieces of prose and poetry according to the classification system emphasized in class.
_____ 5. Given a sinking passenger ship with 19 of its 20 lifeboats destroyed, the captain will decide, based on his or her perception of each individual's potential worth to society, whom to place on the last lifeboat.

Group B: Levels of Cognitive Behavior

a. knowledge
b. comprehension
c. application
d. analysis
e. synthesis
f. evaluation

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

1. Based on your experience in classrooms, provide examples of two behavioral objectives that differ in the degree of expressiveness they allow.
2. Using a topic you have observed being taught in the schools, write an objective for each level of the taxonomy of cognitive objectives: knowledge, comprehension, application, analysis, synthesis, and evaluation. Select verbs for each level from the list provided in the chapter.
3. Now exchange the objectives you have just written with a classmate. Have the classmate check each objective for (a) an observable behavior, (b) any special conditions under which the behavior must be displayed, and (c) a performance level considered sufficient to demonstrate mastery. Revise your objectives, if necessary.
4. A parent calls to tell you that based on a long talk with her son about the objectives you have written for health education, she disapproves of them, particularly those referring to the anatomy of the human body. However, you have taken the objectives almost verbatim from the teacher's guide to the adopted textbook. Compose a brief written response to this parent that shows your understanding of where objectives come from.

Digital Portfolio Activities

These digital portfolio activities relate to INTASC principles 7 and 8:

1. During your first teaching assignment or job interview, you may be asked to provide evidence of your ability to write behavioral objectives properly. The objectives you have written for the preceding Field Experience and Practice Activities 1 and 2 provide examples of your proficiency in writing objectives that represent (a) different degrees of expressiveness, following Eisner's (1969, 1998) view of objectives, and (b) the knowledge, comprehension, application, analysis, synthesis, and evaluation outcomes, following Bloom et al.'s (1984) view of behavioral objectives. Place these objectives in your digital portfolio in a folder titled "Behavioral Objectives."
2. To complete your knowledge of the various approaches to objectives, write objectives for a topic you are likely to teach that represent the categories of procedural knowledge and metacognitive knowledge suggested by Anderson and Krathwohl (2001). Also place these in your "Behavioral Objectives" digital portfolio folder.

Classroom Observation Activities

The following classroom observation activities relate to INTASC principles 7 and 8:

1. For this activity, go to Chapter 3 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 3.1, an observation instrument titled Format for Recording Information

Pertaining to Behavioral Objectives. From a video of an actual classroom lesson or visit to a classroom, record in the first part of the instrument whether the learners were informed of the objective and, if not, why not. This is important, because not every lesson will require informing learners of the objective (e.g., when the lesson is a continuation of a series of related lessons for which the objective is already well known to learners, or when the lesson is devoted entirely to a review, in which case many different objectives may be touched on but not taught directly). After recording this information, indicate whether the objective(s) stated is (are) cognitive, affective, psychomotor, or some combination thereof. If possible, indicate the highest level of performance expected of the learner by selecting the expected outcome that comes closest to the action verbs listed on the instrument. Place your record in the "Classroom Observation" folder of your digital portfolio as documentation of your understanding of behavioral objectives and observation skills.

2. Now go to Chapter 3 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 3.2, titled Form for Recording the Relationship between Levels of Behavioral Complexity and Teaching Strategies. This instrument illustrates a method of recording the relationship among behavioral outcomes at different levels of complexity and the instructional strategies most commonly used to teach them. The behavioral outcomes listed across the top are divided into two types: lower order and higher order. The term *lower order* is used to describe knowledge, comprehension, and application outcomes; the term *higher order* is used to describe outcomes at the analysis, synthesis, and evaluation levels. The teaching functions listed on the left side of the instrument are divided into direct teaching strategies, representing the lecture/presentational approach (in which the teacher is the primary provider of information), and indirect teaching strategies, representing the concept learning, inquiry, and problem-solving approaches to instruction.

   Observe a video of a classroom lesson, and place a checkmark in the appropriate box each time there is a change in teaching strategy or behavioral outcome. At the end of your observation, checkmarks should appear in the upper-left quadrant (lower order/direct) and lower-right quadrant (higher order/indirect), because direct instruction strategies tend to be more efficient for teaching outcomes at the lower levels of behavioral complexity, and indirect instruction strategies tend to be more efficient for teaching outcomes at the higher levels of behavioral complexity. Place your recording form in the "Classroom Observation" folder of your digital portfolio as evidence of your observational skills.

4

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. How do I use state standards and curriculum guides to plan a lesson?
2. How do I make a unit plan?
3. What is in an effective lesson plan?
4. How can I prepare lessons at or slightly above my learners' current level of understanding?
5. How can my lessons provide differentiated instruction to meet the learning needs of individual students and those with special needs?

INTASC

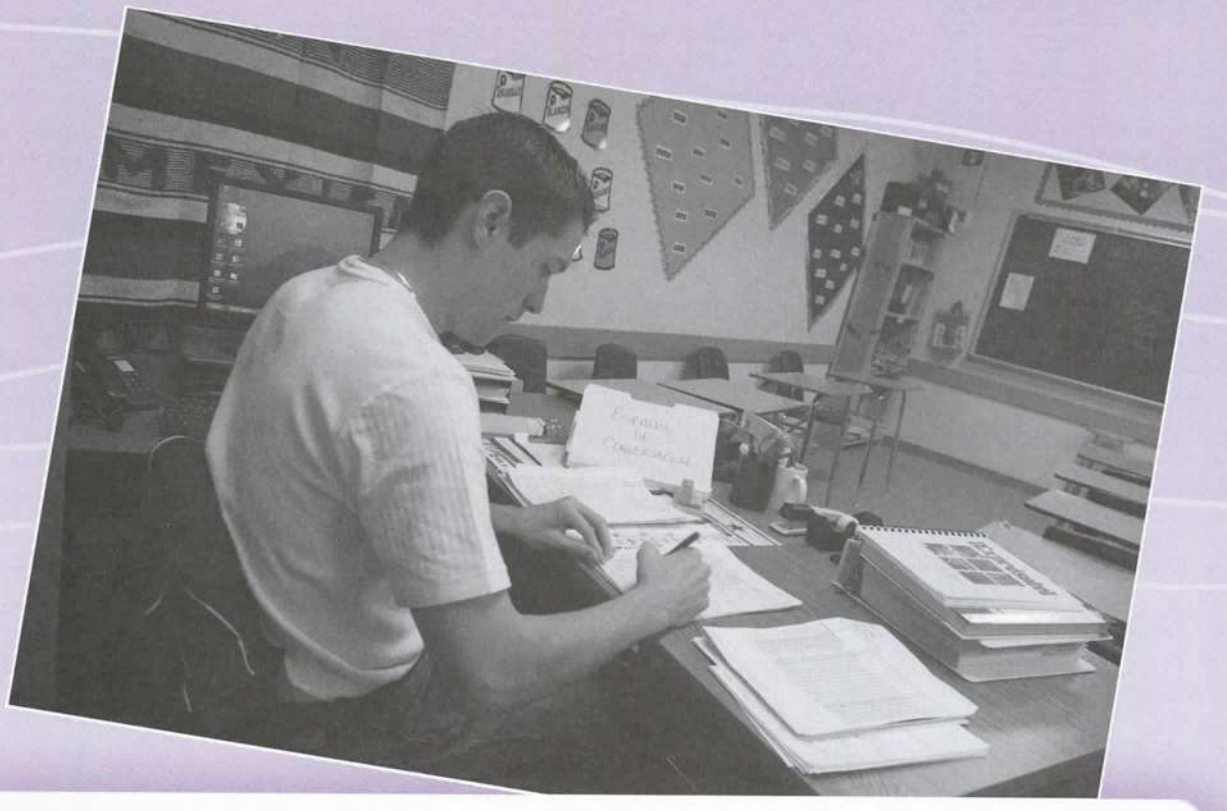
principle 1 The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students.

principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.

principle 7 The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.

principle 9 The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

Unit and Lesson Planning



You are now ready to consider lesson planning and its relationship to the decisions you make in the classroom. Planning is the systematic process of deciding what and how your students should learn. Teachers make one such decision on average of every 2 minutes they are teaching, according to an estimate by Clark and Peterson (1986). However, these "thinking on your feet" decisions represent only part of the decision-making process. Teachers also make many decisions about the form and content of their instruction, such as how much presenting, questioning, and discussing to do; how much material to cover in the allotted time; and how to differentiate instruction and reach students with special needs.

In Chapter 3, you saw the importance of establishing goals and objectives in the planning process. Now let's consider three other factors in the planning process: knowledge of your learners, knowledge of your subject matter, and knowledge of teaching methods.

TEACHER AS DECISION MAKER

Knowledge of Instructional Goals and Objectives

Chapter 3 noted that before you can prepare a lesson, you must decide on your instructional goals and objectives. These planning decisions are crucial for developing effective lesson plans, because they give structure to lesson planning and, as we saw in Chapter 3, tie it to important sources of societal values and professional standards. In this chapter, we present unit and lesson plans as tools for tying these values and standards to your classroom.

Knowledge of Learners

Reviews of research on planning by Clark and Peterson (1986) and Marzano, Pickering, and Pollock (2004) have found that teachers report spending more of their time (an average of 43%) planning instruction around the characteristics of their learners than around any other area of consideration (for example, assessment, classroom management, or the curriculum). Recall from Chapter 2 that some of the characteristics of your learners that will influence your instruction are their specific abilities, prior knowledge, learning styles, and home and family lives. These are the "windows" through which you will see the special needs of your learners and begin to plan for them.

Planning with respect to your learners begins by consciously noting their unique abilities and experiences that can provide you the opportunity to select content, materials, objectives, and methods that match their current level of understanding and meet their special learning needs. This knowledge will be instrumental in helping you organize, select, sequence, and allocate time to various topics of instruction.

Knowledge of Subject Matter

A second aspect of planning is knowledge of your academic discipline and grade level. As a student, you have spent much time and effort becoming knowledgeable in the subjects you will teach. You have observed and absorbed valuable information about how textbook authors, your instructors, subject-matter specialists, and your state's education standards have organized concepts in your teaching area. This information includes how parts of a subject relate to the whole, how content is prioritized, how transitions are made between topics, and which themes are major and which minor. Consciously reflecting on this content organization—as presented by subject-matter specialists, state standards, and curriculum guides—when preparing your lessons will make learning for your students easier, more orderly, and more conducive to retention and later use. Deriving your content organization from these sources also can be instrumental in helping you select, sequence, and allocate time for what you will teach.

Knowledge of Teaching Methods

A third input to the planning process is your knowledge of teaching methods. With this knowledge comes an awareness of different teaching strategies with which you can implement the key and helping behaviors introduced in Chapter 1. Also included under teaching methods are your decisions about the following:

- Appropriate pacing or tempo (the speed at which you introduce new material)
- Mode of presentation (direct presentation versus group discussion)
- Class arrangement (small groups, full class, independent study)
- Classroom management (raise hand, speak out)

Your decisions about these topics should work together to form a well thought out plan from which you will teach individual lesson objectives.

Summary of Inputs to Planning

To recap, the four primary inputs to the planning process are the following:

1. Knowledge of content standards and objectives
2. Knowledge of learner characteristics
3. Knowledge of subject matter
4. Knowledge of teaching methods

Shulman (1992) identified four specific sources from which you can obtain knowledge about standards and objectives, learners, subject matter, and teaching methods: (1) practical experiences, such as viewing classroom videos, observing in classrooms, and student teaching; (2) reading case studies about what more successful and less successful teachers have done; (3) reading the professional literature about important goals and standards and paradigms for thinking about teaching; and (4) reading empirical studies about what the research says about your subject and how to teach it. Each of these is a valuable source for extending and updating your knowledge of learners, content, and teaching methods. The chapters ahead will present key findings for effective teaching from each of these four areas.

Reflective Practice and Tacit Knowledge

As a beginning teacher, you probably regard your content and method knowledge as hard won during four long years of professional training. To be sure, it is—but you have only just begun. Your knowledge of content and methods will change with the interaction of your formal university training and your actual classroom experience.

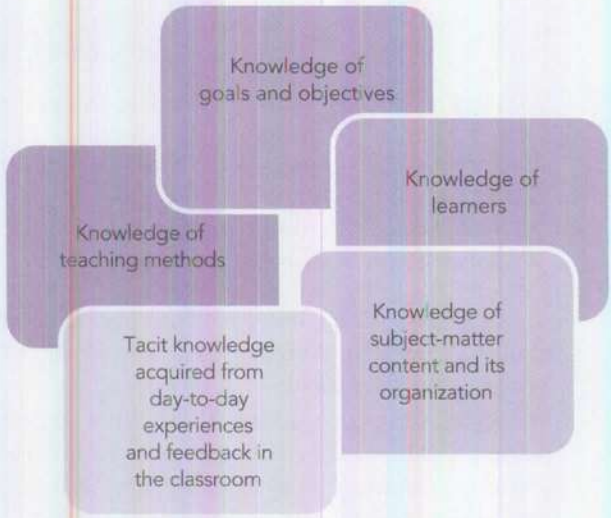
This change will result in what is called **reflective practice,** fueled by your tacit, or personal, knowledge gained from your day-to-day experience (Canning, 1991; Gill, 2000; Polanyi, 1958; York-Barr, Sommers, Ghere, & Montie, 2006). **Tacit knowledge** represents your reflection on what works in your classroom, discovered over time and through personal experience. Through everyday experiences such as observing other teachers, working with learners, lesson planning, and testing and grading, you will accumulate tacit knowledge and reflect on new ways of doing things that can guide your actions as effectively as knowledge from texts and formal training. This knowledge, if you take the time to reflect on it, will add to the quality of your planning and decision making by bringing variety and flexibility to your lessons, leading to revisions and refinements that can improve your unit and lesson planning. Tacit knowledge can make your planning less rigid and repetitious and over time add fresh insights to your personal teaching style. Thus we add this fifth input to the planning process, shown in Figure 4.1.

Unit and Lesson Plans

The important process of unit and lesson planning begins with implementing the five planning inputs (see Figure 4.1). This stage of the planning process takes a **system perspective,** meaning your lessons will be part of a larger system of interrelated learning, called a *unit.*

The word *system* brings to mind terms such as *school system, mental health system,* and *legal system.* Schools, mental health services, and criminal justice agencies are supposed to work as systems. This means their component parts are to interrelate and build toward

Figure 4.1 Inputs to the Planning Process



some unified concept. For example, in a school system, discrete facts, skills, and understandings learned at the completion of the sixth grade are not only important in themselves but also for successfully completing the seventh grade. Seventh-grade outcomes, in turn, are important for completing the eighth grade and so on through the educational system, until the high school graduate has accumulated many of the facts, skills, and understandings necessary for adult living.

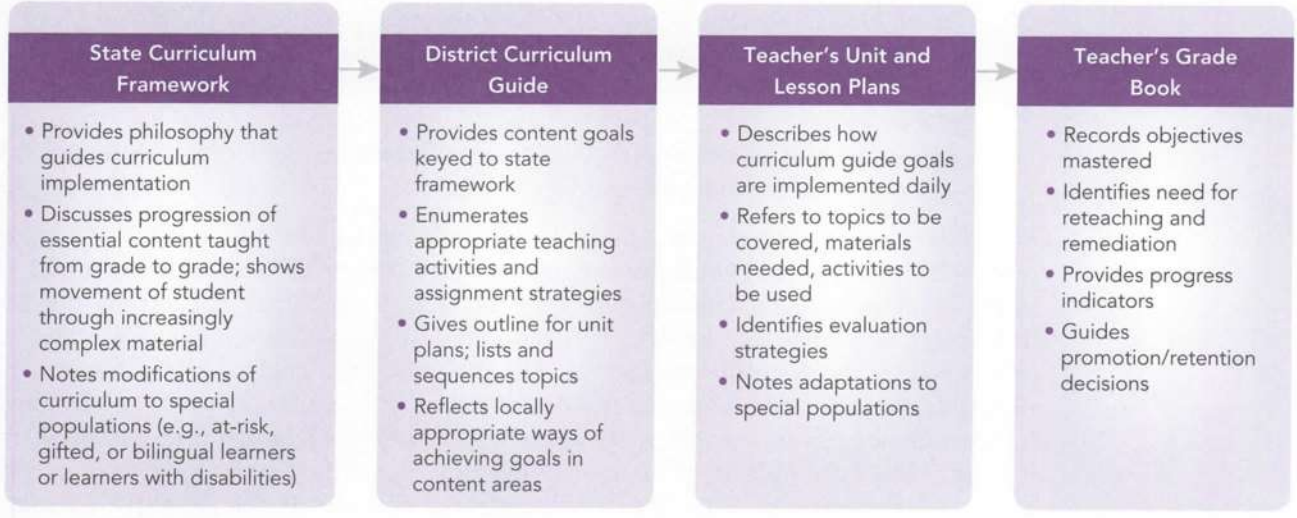
The true strength of a system, however, is that the whole is greater than the sum of its parts. Can a unit of instruction comprising individual lessons ever add up to anything more than the sum of the individual lessons? This sounds like getting something for nothing, a concept that does not ring true. But if the system of individual lessons really can produce outcomes in learners that are greater than the sum of the outcomes of the individual lessons, then another ingredient must be needed.

That missing ingredient is the relationship among the individual lessons. This relationship must allow the outcome of one lesson to build on the outcomes of preceding lessons. Knowledge, skills, and understandings evolve gradually through the joint contribution of many lessons arranged to build toward more and more complex outcomes. It is this invisible but all-important relationship among the parts of an instructional unit that allows the unit outcomes to be greater than the sum of the lesson outcomes.

Of considerable importance is the relationship of your district's curriculum guide to your unit and lesson plans. Units generally extend over an instructional time period of approximately 1 to 4 weeks. They usually correspond to well-defined topics or themes in the curriculum guide. Lessons, however, are considerably shorter, spanning a single class period or occasionally two or three periods. Because lessons are relatively short, they are harder to associate with particular segments of a curriculum guide. This means you can expect unit content to be fairly well structured and defined but lesson content—what you do on any given day—to be much less detailed in a curriculum guide.

This is as it should be, because the arrangement of day-to-day content in the classroom must be flexible to meet your individual students' needs, your instructional preferences, and special priorities and initiatives in your school and community. So although the overall picture at the unit level may be clear from the district's curriculum guide, at the lesson level, you must apply considerable independent thought, organization, and judgment. Figure 4.2 indicates the flow of teaching content from the state level to the classroom, illustrating the stages through which a curriculum framework is translated into unit and lesson plans.

Figure 4.2 Flow of Teaching Content from the State Level to the Classroom Level



MAKING PLANNING DECISIONS

Unit planning begins with an understanding of your state's standards, your students' learning needs, the content you will teach, and the teaching methods available to you. Let's take a closer look at several types of decisions you will make pertaining to these inputs to the lesson-planning process.

Standards and Objectives

State standards and **curriculum guides** derived from the grade, subject, and school district levels clearly specify the content that must be covered and in what period of time. But they may be far less prescriptive about the specific outcomes that students are expected to acquire. For example, an excerpt from a curriculum guide for English-language instruction might take this form:

1. *Writing concepts and skills.* The student shall be expected to learn
    a. The composing process
    b. Descriptive, narrative, and expository paragraphs
    c. Multiple paragraph compositions
    d. Persuasive discourse
    e. Meanings and uses of colloquialism, slang, idiom, and jargon

Or for a life science curriculum, the guide might provide the following:

2. *Life science.* The student shall be expected to learn
    a. Skills in acquiring data through the senses
    b. Classification skills in ordering and sequencing data
    c. Oral and written communication of data in appropriate form
    d. Concepts and skills of measurement using relationships and standards
    e. Drawing logical inferences, predicting outcomes, and forming generalized statements

And for a geography curriculum, the guide might include this information:

3. *Geography.* The student shall be expected to be able to

   a. Use cardinal and intermediate directions to locate places such as the Amazon River, Himalayan Mountains, and Washington, DC, on maps and globes
   b. Use a scale to determine the distance between places on maps and globes
   c. Identify and use the compass rose, grid, and symbols to locate places on maps and globes
   d. Draw maps of places and regions that contain map elements, including a title, compass rose, legend, scale, and grid system

Notice in these excerpts the specificity with which the content is identified (e.g., the composing process; skills in acquiring data through the senses; and use of cardinal and intermediate directions). In contrast, note the lack of specificity concerning the level of learning outcome (e.g., knowledge, comprehension, application, analysis, synthesis, or evaluation) to which the instruction should be directed. This is typical of many curriculum guides and provides you the flexibility to differentiate instruction by offering learners choices in the complexity of content with which a learning task will begin that matches their current level of understanding and from which every learner can experience academic success. Recalling the taxonomy of behavior in the cognitive domain in Chapter 3, you could ask the following questions:

- For which of these content areas and for which students will the simple recall of facts be sufficient?
- For which areas and which students will comprehension of those facts be required?
- For which areas and which students will application of what the student comprehends be expected?
- For which areas and which students will higher-level outcomes involving analysis, synthesis, and decision-making skills be desired?

Therefore, one of the most important decisions you will make will be to select the level(s) of learning outcome(s) for which an instructional unit or lesson will be prepared and to what extent differentiated content and outcomes may be needed for individual learners, groups, and students with special needs. The flexibility afforded by most curriculum guides in selecting the learning outcome to which instruction can be directed is both purposeful and advantageous for you. For the curriculum guide to be adapted to the realities of your classroom, a wide latitude of expected outcomes must be possible. These will depend on the unique characteristics and individual differences among your students, the content and time you can devote to a specific topic, and the overall learning outcomes desired at the unit level. Let's look at each of these more closely.

Learners

As we have seen, curriculum guides allow you the flexibility to adapt your instruction to the individual learning needs of your students. Chapter 2 presented several categories of individual differences that will be characteristic of the students in your classroom. These included differences in ability (including physical, learning, visual, and communication disabilities, which may represent special learning needs), prior achievement, learning style, culture, and home life. These factors can reflect entire classrooms as well as individuals. Other categories of learners—such as at-risk, bilingual, and gifted students—may add even greater diversity to your classroom. They may create the need for task-related subgroups that require individual attention, time-limited groups of higher- and lower-performing learners, or differentiated instruction for individual learners—all alternatives that will be addressed in this and chapters to come.

Content

Perhaps foremost in the mind of the beginning teacher is the content to be taught. Your content decisions may appear easy, in that textbooks, workbooks, and curriculum guides have identified what you will teach before your first day in the classroom. Indeed, as you saw in the excerpts from the curriculum guides, content often is designated in considerable detail. Textbooks and workbooks carry this detail one step further by offering activities and exercises that define and expand the content in the curriculum guide even more. From this perspective, it may appear as if all of the content has been handed to you, if not on a silver platter, then surely in readily accessible and highly organized tests, workbooks, and curriculum materials.

Although some teachers might wish this were true, most quickly realize that as many decisions must be made about content—what to teach—as about learning needs and outcomes. You will quickly come to realize that adopted texts, workbooks, and even detailed curriculum guides identify the content to be taught but do not select, organize, and sequence that content according to the needs of your learners. And increasingly, school districts, textbook publishers, and software companies are providing alternative texts, software, and workbooks from which teachers can choose to better target specific populations of learners. Effective teachers know they must select from this content for some learning outcomes and learners and add to this content for others to actively engage them in the learning process at or slightly above their current level of understanding.

Outcomes

Establishing relationships between your lessons is one of the most important planning decisions you will make to achieve your desired outcomes. How your lessons interrelate can even determine if and how well your learners achieve higher-level outcomes in the cognitive, affective, and psychomotor domains. And this decision in turn will determine how well your unit and lesson plans reflect a thinking curriculum.

The higher levels of behavior can rarely if ever be achieved in a single lesson. Thus lessons must be placed within a unit, or system of lessons, in which individual lessons build on previously taught outcomes to achieve higher-order outcomes at the end of a unit. This is why your structuring of lesson content is so important to unit planning: Without it, the outcomes at the end of the unit may be no different from those achieved at the completion of each single lesson. Unlike miscellaneous items stored in the attic of your house or the glove compartment of your car, units should have a coherent, unified theme that rises above the cognitive, affective, and psychomotor outcomes of any single lesson.

For example, the reason you organize a particular series of lessons (e.g., on acid rain, new technologies, and conservation legislation) might be to show how several content areas can be brought together with a single theme for the purpose of solving a problem, thinking critically, or forming an independent judgment. In this case, the unit goal and needs of your learners will have played an important role in selecting this particular organization. Thus your decisions about unit structure will depend on the match between the level of learning outcomes you choose and your students' current level of understanding of the content you are teaching.

Now let's put your knowledge of objectives, learners, content, and organization to work in preparing unit and lesson plans.

DISCIPLINARY AND INTERDISCIPLINARY UNIT PLANS

The following two sections introduce unit plans and how to communicate them in a clear and orderly manner. The first approach to unit planning will show you how to plan

and teach knowledge and understanding within a discipline—or vertically. **Vertical unit planning** is a method of developing units within a discipline in which the content to be taught is arranged hierarchically or in steps (e.g., from least to most complex, or from concrete to abstract) and presented in an order that ensures that all task-relevant prior knowledge required for subsequent lessons has been taught in previous lessons.

Following our discussion of disciplinary unit planning, we present a second means of communicating knowledge and understanding to your learners called *interdisciplinary unit planning,* which involves a technique called *lateral planning.* **Lateral unit planning** can be used for planning units that integrate bodies of knowledge across disciplines or content areas to convey relationships, patterns, and concepts that run across disciplines and bind different aspects of our world in some systematic way. Lateral unit plans move across the established boundaries of content areas to elicit problem solving, critical thinking, cooperative activity, and independent thought and action, emphasizing that the whole is greater than the sum of its parts. As you will see, both vertical and lateral unit planning are valuable tools for acquiring the skills of an effective teacher and meeting the unique needs of your learners.

Disciplinary (Vertical) Unit Plans

An old Chinese proverb states, "A picture is worth a thousand words." This section applies this age-old idea to unit planning by showing how you can develop a unit plan by creating a visual blueprint of your unit. This section also shows you how to use written and graphic formats to express a unit plan within a discipline, subject, or content area.

Of course, a visual device cannot substitute for a written description or outline of what you plan to teach, but it is an effective means of organizing your thinking about what you will teach. Scientists, administrators, engineers, and business executives have long known the value of visuals in the form of flowcharts, organization charts, blueprints, diagrams, and mindmaps (Buzan, 2004; Kenny, 2004; Mintzes, Wandersee, & Novak, 2000) to convey the essence of a concept, if not the details. From the beginning, teachers have used this basic method too. Pictures not only communicate the results of planning but are useful during the planning process to organize and revise a unit plan and to see the "big picture," or final outcome, you are working hard to achieve.

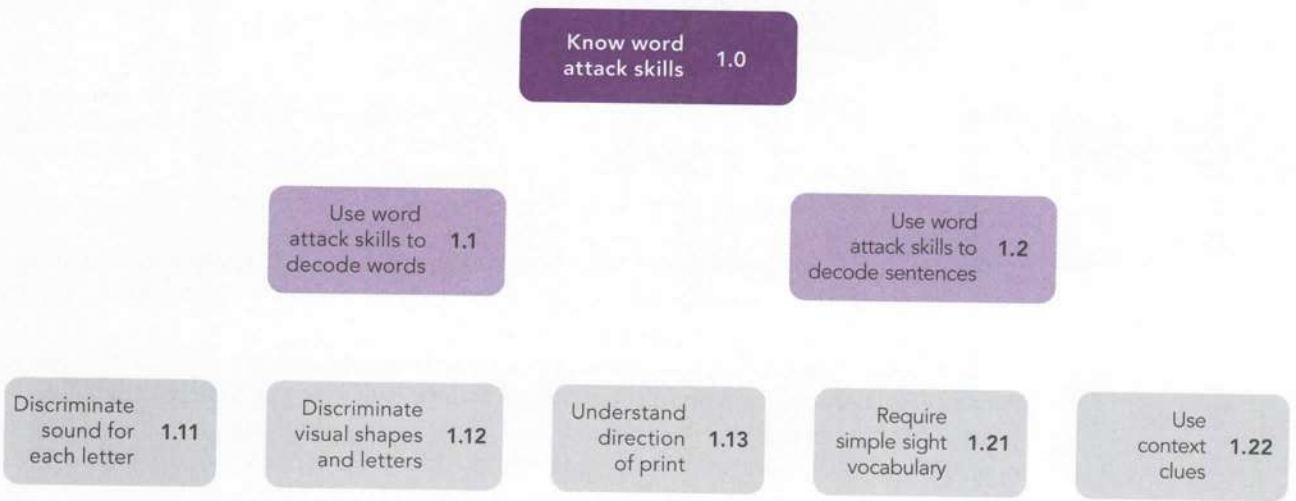
Although teaching parallels many other fields by using visual devices in planning, it is also a unique profession in many ways. Unlike that of a business, the product of education does not roll off an assembly line, nor does education build its product using the mathematical laws and physical materials used by the scientist and engineer. Consequently, your visual blueprints differ from those of others but at the same time reflect the qualities that have made pictures so important to planning in these other professions.

You already have been introduced to two of these qualities: the concept of *hierarchy,* which shows the relationship of the parts to the whole (lessons to unit), and the concept of *task-relevant prior knowledge,* which shows the necessity for a certain lesson sequence (Walberg, 1991, p. 38). In vertical unit planning, both concepts are put to work in creating a visual picture of a unit; such a picture can both stimulate and organize your thoughts and communicate the results to others in an easy-to-follow graphic format.

Two simple rules are used in drawing a picture of a vertically planned unit. The first is to diagram how the unit goal is divided into specific lessons. The second is to show the sequence of these lessons and how their outcomes build on one another to achieve the unit goal. Let's look at these two rules.

Visualizing Specific Teaching Activities. Our first rule simply uses boxes to visualize areas of content—or instructional goals—at various levels of generality. In other words, any goal at the unit level can be broken into its component parts at the lesson level. Those component parts represent everything that is important for attaining the goal. This idea is illustrated in Figure 4.3.

Figure 4.3 Example of a Hierarchy of Reading Content at Different Levels of Specificity



Notice that Figure 4.3 has three levels. For now, focus on the top and bottom levels. The top shows the unit goal, which is derived from the curriculum guide and adopted textbook, which in turn are based on societal, state, and local goals. The bottom row shows content expressed at a level specific enough to prepare individual lessons.

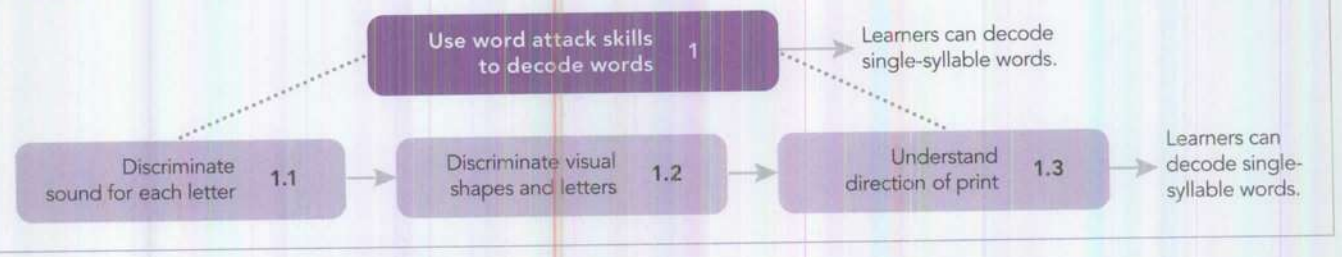
This unit plan ends with bite-sized chunks that together exhaust the content specified at the higher levels. Just as in the story "Goldilocks and the Three Bears," the bottom of the unit plan hierarchy must end with the portion of content being served up as not too big and not too small—but just right for individual lesson planning. How can you know whether you have achieved the right size and balance for a single lesson?

The second level of Figure 4.3 shows a logical means of getting from the general unit goal to specific lesson content. It is an intermediate thinking process that produces the lower level of just-right-sized pieces. How many intermediate levels should you have? There is no magic number; it depends on how broadly the initial goal is stated and the number of steps needed to produce content in just the right amounts for individual lesson plans. Experience and judgment are the best guides, although logical divisions within the curriculum guide and text are helpful, too.

In some cases, the route from unit to lesson content can be very direct (two levels); in other instances, several levels may have to be worked through before arriving at lesson-sized chunks. If you have trouble getting sufficiently specific for lesson-sized content, you may need to revise the unit goal by dividing it into two or more subgoals and beginning a new hierarchy from each subgoal. This was done in Figure 4.3, where the unit planner had to create two units of instruction (1.1 and 1.2) from the same goal (1.0). Notice that this is done in the same way you create an outline. This process of building a content hierarchy will guide you in making the important distinction between unit and lesson content and can prevent you from making false starts in lesson planning.

Visualizing the Sequence of Activities. The second rule shows the sequence of lessons and how lesson outcomes build on one another to achieve a unit goal. This second rule, illustrated in Figure 4.4, shows the order of the individual lessons, when order is important. Notice that in Figure 4.4, we chose the first box from the second level (1.1) of the hierarchy in Figure 4.3 as our unit goal. Then, to indicate the intended unit outcome, we placed an arrow extending from the right of this top box. The outcome of all the lessons derived from it, taken together, should be the same as this unit outcome. This

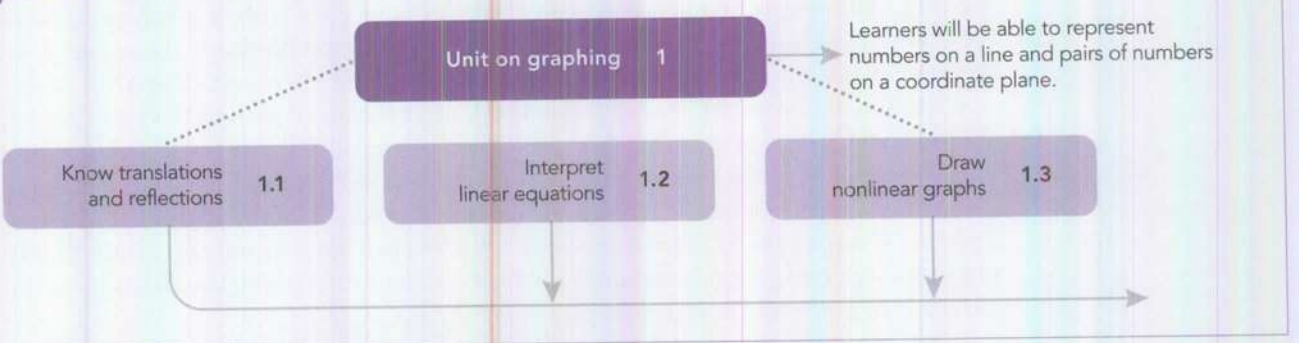
Figure 4.4 Unit Plan Showing a Sequence of Lessons



will always be true, regardless of whether the sequence of your lessons is important. In some instances, this sequence may be unimportant (see Figure 4.5); for others, a partial sequence may be appropriate (see Figure 4.6).

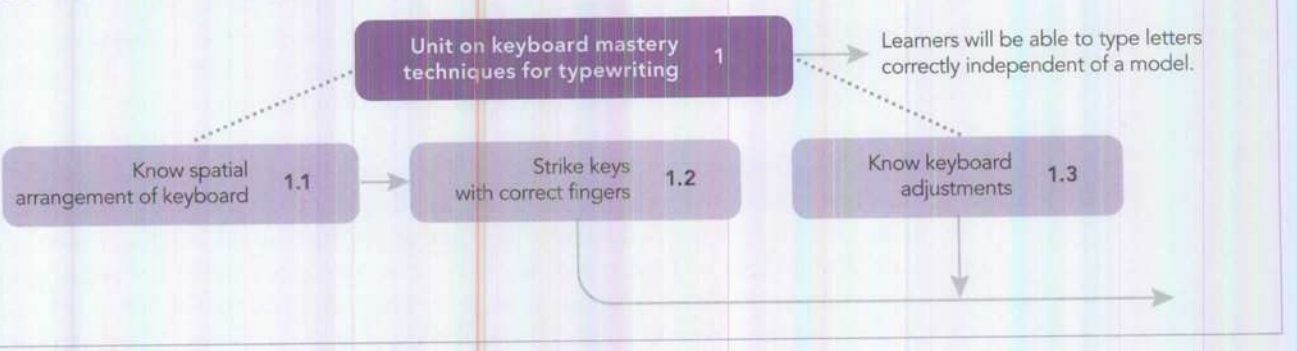
This second rule recognizes how previous lessons can modify or constrain the outcomes of subsequent lessons. It encourages you to build on previously taught learning to provide increasingly more authentic and higher-order thinking outcomes at the unit level. This will be important if your unit plan is to promote a thinking curriculum. If your lesson outcomes are unrelated, your unit outcome will not likely be at any higher level of cognitive, affective, or psychomotor complexity than your individual lesson outcomes. As an effective teacher, you should plan the interrelationships among lessons in a way that encourages higher-order thinking to emerge at the unit level. (You may want to consult again the taxonomies of behavioral outcomes in Chapter 3 and the Higher-Order Thinking and Problem-Solving Checklist in Appendix C.)

Figure 4.5 Unit Plan without Lesson Sequence



Note: Lessons 1.1, 1.2, and 1.3 can occur in any order.

Figure 4.6 Unit Plan with Partial Lesson Sequence



Note: Lesson 1.1 must precede Lesson 1.2.

Visualizing your unit plan has several advantages. Seeing a lesson in context with other lessons that share the same purpose focuses your attention on the importance of the knowledge and understandings that must be taught prior to your lesson for it to be a success. Recall that if learners have inadequately acquired (or not acquired at all) the prerequisite knowledge and skills relevant to your lesson, some or most of them will not attain your lesson objective. One purpose of seeing lessons within a unit plan is to determine whether you have provided all the task-relevant prior knowledge required by each lesson. Because unit plans precede lesson plans, you can easily add the overlooked lessons and objectives prerequisite to later lessons. You can draw your unit plans graphically, as shown in this chapter, using the word-processing or graphics software on your personal computer or using Inspiration Software (www.inspiration.com/home.cfm).

While the graphic format of your lesson plan sequence shows what content must be taught before other content, it does not indicate the possible need to differentiate instruction for individual learners and groups or to reach special populations. Now you must ask, What might be the role of learning style, language development, special learner needs, and even home environment on my learners' ability to profit from the lessons and homework I have planned? For example, would a learner's physical, hearing, communication, or visual impairment; language development; home life or culture; or prior learning history preclude his or her engagement with the lesson? When these learner characteristics are sufficiently instrumental to your transmission of content and the learner's ability to profit from it, they should be added to your graphic unit plan to indicate the technology, resources, materials, and strategies needed to differentiate instruction and reach special-needs learners.

Here is a list of some of the materials and strategies identified by teachers on their graphic unit plans that over the course of a semester reminded them of opportunities for differentiated instruction and how they might better accommodate special learner needs. These were added beneath the lessons to which they were relevant with codes such as 1, 2, 3, and so on:

1. Use bilingual handouts.
2. Provide extra time for students with ADHD.
3. Use small groups for G&T (gifted and talented) students.
4. Partner up for PD (physically disabled) students.
5. Assign computer lessons for remedial work.
6. Open a dictionary station.
7. Check orally for LP (lower performers).
8. Pair students for homework assistance.
9. Copy oversized visuals for reference.
10. Allow LPs to choose their own response formats.

The Written Unit Plan. Planning units graphically will be helpful in organizing, sequencing, and arriving at bite-sized pieces of content at the lesson level. But you will also need a description that will communicate details of the unit to others and that you can place in your digital portfolio for use at a later time.

One format for a written version of a unit plan appears in Figure 4.7. This format divides a written plan into its (1) main purpose, (2) behavioral objectives, (3) content, (4) procedures and activities, (5) instructional aids or resources, and (6) evaluation methods. You should attach your visual blueprint to this written plan to indicate at a glance the organization, sequence, and size of the unit and to provide an introduction and overview of the written details. Together they will give you a powerful tool for communicating your unit plan.

Finally, notice that in Figure 4.7, both the objectives and individual learners progress from the lower levels of cognitive and psychomotor behavioral complexity (comprehension,

Figure 4.7 Example of a Unit Plan

Grade: 10

Unit Topic: Pizza with Yeast Dough Crust

Course/Subject: Contemporary Home Economics

Approximate Time Required: One week

1. **Main Purpose of the Unit:** The purpose of this unit is to acquaint the students with the principles of making yeast dough by making pizza. The historical background, nutritional value, and variations of pizza will also be covered.

2. **Behavioral Objectives**
   The student will be able to:
   A. Describe the functions of each of the ingredients in yeast dough. (Cognitive-knowledge)
   B. Explain the steps in preparing yeast dough. (Cognitive-comprehension)
   C. Make a yeast dough for a pizza crust. (Cognitive-application and psychomotor-precision)
   D. State briefly the history of pizza. (Cognitive-knowledge)
   E. Match the ingredients in pizza to the food groups they represent. (Cognitive-knowledge)
   F. Classify and give examples of different types of pizza. (Cognitive-analysis)
   G. Create and bake a pizza of their choice. (Cognitive-synthesis and psychomotor-precision)

3. **Content Outline**
   A. Essential ingredients in yeast dough
      (1) Flour
      (2) Yeast
      (3) Liquid
      (4) Sugar
      (5) Salt
   B. Non-essential ingredients
      (1) Fats
      (2) Eggs
      (3) Other, such as fruit and nuts
   C. Preparing yeast dough
      (1) Mixing
      (2) Kneading
      (3) Rising (fermenting)
      (4) Punching down
      (5) Shaping
      (6) Baking
   D. History of pizza
      (1) First pizza was from Naples.
      (2) *Pizza* is an Italian word meaning pie.
      (3) Originally eaten by the poor, pizza was also enjoyed by royalty.
      (4) Italian immigrants brought pizza to the United States in the late 1800s.
   E. Types of pizza
      (1) Neapolitan
      (2) Sicilian
      (3) Pizza Rustica
      (4) Pizza de Polenta
   F. Nutritional value of pizza
      (1) Nutritious meal or snack
      (2) Can contain all four food groups
      (3) One serving of cheese pizza contains:
         (a) Protein
         (b) Vitamins
         (c) Minerals
   G. Making a pizza
      (1) Prepare dough
      (2) Roll out dough
      (3) Transfer to pan
      (4) Spread sauce
      (5) Top as desired
      (6) Bake

4. **Procedures and Activities**
   A. Informal lecture
   B. Discussion
   C. Demonstration of mixing and kneading dough
   D. Filmstrip on pizza
   E. Education game (Pizzeria): Each time a student answers correctly a question about yeast dough or pizza, he gets a part of a paper pizza. The first to collect a complete pizza wins.

5. **Instructional Aids or Resources**
   A. Text: *Guide to Modern Meals* (Webster, McGraw-Hill, 2007)
   B. Filmstrip: *Pizza, Pizza* 10 minutes
   C. *Pizza, Pizza* booklets by Chef Boyardee:
   D. Educational game (Pizzeria)
   E. *Bake-it-easy Yeast Book* by Fleischmann's Yeast
   F. Poster (showing different kinds of pizza from Pizza Hut)

6. **Evaluation**
   A. Unit test
   B. Lab performance

Source: From *Curriculum Planning: A Ten-Step Process*, by W. Zenger and S. Zenger, 1982. Palo Alto, CA: R and E Research Associates. Copyright © 1982 by R and E Research Associates.

application, imitation) to the higher levels (analysis, synthesis, precision). This illustrates how early lessons in a unit can be used as building blocks to attain higher-level outcomes, helping to achieve a thinking curriculum (Borich, 2007b; Erickson, 2006; Kagan & Tippins, 1992).

Interdisciplinary (Lateral) Unit Plans

Results of research indicate that teaching a unit in which different content areas are organized around a central theme and thus integrated can lead to high levels of thinking and meaningful learning, if the instructional techniques used involve students interactively (Erickson, 2006; National Research Council, 2001; Richmond & Striley, 1994; Roblyer, 2005; Shavelson & Baxter, 1992).

An **interdisciplinary unit** is a laterally planned unit of study in which topics are integrated to provide a focus on a specific theme (Martin, 1995; Martinello & Cook, 2000; Roberts & Kellough, 2006). This approach to learning helps students make connections. The principal aim of interdisciplinary instruction is to present learners with an opportunity to discover relationships and patterns that go beyond a specific discipline and that bind different aspects of our world in some systematic way (McDonald & Czerniak, 1994). For example, interdisciplinary units often represent themes that can be related to several different subject-matter areas at the same time, such as English and reading, science, social studies, or the expressive arts. Effective interdisciplinary units also often require learners to conduct investigations that require cooperative learning and the use of reference tools.

Interdisciplinary units provide opportunities for classroom dialogue, in which learners are expected to reason critically, ask questions, make predictions, and, with the aid of the teacher, evaluate the appropriateness of their own responses. Recent trends in interdisciplinary thematic teaching can help teachers achieve these goals but only if the themes that organize the unit are chosen carefully and in ways that help students understand how the content connects to their own lives (Ritter, 1999).

For example, Roberts and Kellough (2006) describe one teacher who planned an interdisciplinary unit for her middle school students by having them read a story about a young boy who travels through time and journeys to a fantasy planet. As the boy struggles to adapt to his new culture, he experiences isolation, loneliness, domination, and imprisonment. To relate this story to several different disciplines based on students' reading, the teacher planned a unit in which the following relationships were drawn between and within disciplines:

- *Related to English.* The students discussed changes in the novel's setting, the development of the plot, and the author's use of the literary device of foreshadowing.
- *Related to the expressive arts.* The students made a model of the planet and a floor plan of some of the buildings, and they designed a robot that was described in the story. They also staged a dramatic reenactment of a scene in the novel.
- *Related to science.* Some students studied the flora and fauna on the planet and compared it to the plants and animals of their own state; others attempted to determine the chemical composition of the environment on the planet and identify a probable location for it in our solar system.
- *Related to social studies.* The students engaged in a map study of the planet, developed a government for the fantasy planet, compared the segregation practiced in the story with segregation elsewhere, compared the freedoms of the inhabitants on the planet with the freedoms in our own Bill of Rights, and discussed issues of prejudice and class structure.
- *Related to additional research.* The students studied popular research on dreams and experiments about the sleep of humans, which played a predominant role in the story.

Notice how the relationships and patterns across subject areas in this unit did not just happen. This teacher developed her unit from a carefully constructed list of interrelated themes that she could select from and add to when determining the areas of the curriculum to be taught. To prepare her unit plan, the teacher used a set of thematic concepts, topics, and categories like that shown in Table 4.1. This information was mapped onto

Table 4.1 Theme Development for an Interdisciplinary Unit

Thematic Concept	Topic	Category of Literature
Freedom	Individual	Autobiographies
Cooperation	Society	Dreams
Challenge	Community	Fantasies
Conflict	Relationships	Tall Tales
Discovery	Global Concerns	Experiences
Culture	War	Firsthand Accounts
Change	Partnerships	
Perseverance		

the existing subject matter in this teacher's and other teachers' classrooms and brought to life through an interdisciplinary thematic unit.

Interdisciplinary units can help you achieve the following objectives:

1. Emphasize that the process of learning is sometimes best pursued as an interconnected whole, rather than as a series of specific subjects.
2. Encourage students to work cooperatively in partnerships and small groups that focus on the social values of learning.
3. Teach students to be independent problem solvers and thinkers.
4. Assist students to develop their own individual interests and learning styles.
5. Help students determine what they need to know and what they need to learn, rather than always expect the teacher to give it to them.

A key component of **thematic units** is the varied structure of the instructional strategies used. For example, you can give your students a variety of activities and materials in several related content areas along with some challenging questions to facilitate collaboration and create a desire to learn more about a topic. Or you can have students work independently at times but also collaborate in groups to read, pose and investigate problems, and complete projects related to two or three different content areas. One group investigates a problem from one content area, while another group takes a different perspective. In this way, students interact and learn from each other. Your role is that of a facilitator or moderator of learning.

The Spectrum of Integrated Curricula. Roberts and Kellough (2006) identify four ways you can implement **integrated thematic teaching** in your classroom, representing different degrees of involvement (Parkay & Hass, 2005).

Level 1. At this level, you would use a thematic approach to relate content and material from various content areas during the same day. For example, the theme "Natural Disasters Cause Social Effects" could originate from the topic of "Weather," normally taught within a science or geography lesson, and the topic of "Community," normally taught within a social studies lesson. You would convey the theme of this interdisciplinary lesson to learners at the beginning of the unit in the form of a question, such as "What necessary functions in a community are often disrupted after a natural disaster?" Encourage students to suggest adding other content and questions.

Level 2. The next level of implementation requires you to consult with other teachers and agree on a common theme. Each teacher who decides to participate in the interdisciplinary unit teaches to that theme in his or her own classroom. In this manner, students

learn from a teacher in one classroom something that is related to what they are learning in another classroom. In the early elementary grades, a single teacher can perform this same function by referring back, say, during reading instruction to a related concept in social studies, math, or science. Display on the bulletin board a list of themes developed beforehand based on interconnections among subject areas to remind both you and your learners to identify and discuss the connections, and then have students make the connections with examples of their work.

Level 3. At the third level, you and your students work together to form a list of common themes across subject areas. For example, in the later elementary and high school grades, you might give an assignment to search the table of contents of your text and those of other teachers for topics of thematic units you might teach in your classroom. If other teachers agree on the theme developed, they, too, can be encouraged to mutually reinforce the connections identified in their classrooms, thereby providing momentum across disciplines for your thematic unit. This level of implementation is an effective way to initiate a team approach to your interdisciplinary teaching.

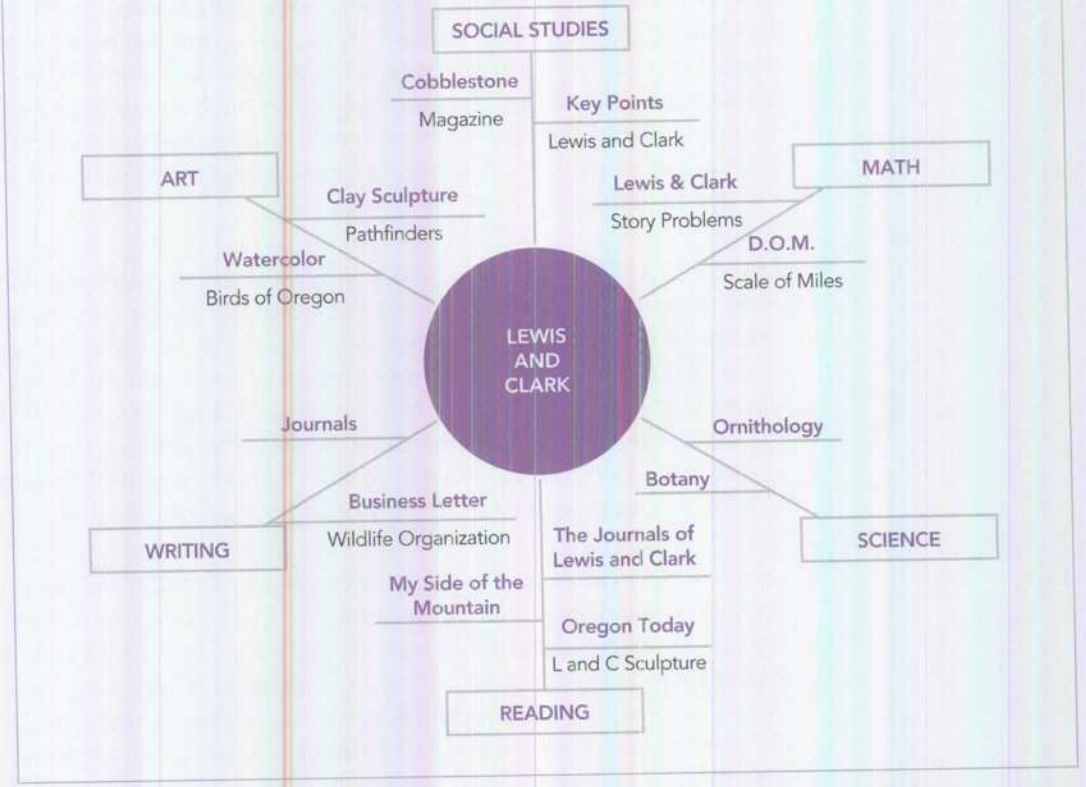
Level 4. At the fourth level, your students develop on their own a list of common themes or problems across disciplines. Your charge to students is to arrive at one or more themes in which a traditional subject, discipline, or content area would be inadequate for addressing the theme or resolving a problem. In other words, you instruct your students to find current, contemporary dilemmas, moral issues, and problems that defy solution in the context of any one or a small number of traditionally defined subject areas. Students may therefore be challenged to raise such a thorny problem as "How can we know when someone has really died?", requiring the simultaneous consideration of the latest advances in the fields of medicine, religion, and philosophy, or "How can we rid our planet of life-threatening pollution?", possibly requiring your class to consider knowledge from general science, physics, and chemistry and from social studies, government, and the law. At this level, your students are playing the role of independent and socially responsible thinkers, and you are playing the role of resource, guiding their thoughts and refocusing them when necessary in increasingly productive avenues for elaborating relationships, patterns, and concepts for adult living.

Visualizing Your Interdisciplinary Unit. Because interdisciplinary units emphasize lateral knowledge, their graphic portrayal is different from that of disciplinary units, which emphasize vertical knowledge. The graphic technique you use for expressing lateral knowledge should allow for content to be woven in and out of lessons as the opportunity arises, without a predetermined sequence. Hence a more free-form or web-type visual format is required, sometimes called a *concept map* or *thinking map* (Buzan, 2004; Hyerle, 1995–1996; Novak, 2001). This type of format shows how content is nestled within other content, how different subject areas share a common theme, how a single theme is threaded through different content areas, and how one field of study is immersed in another. Thus all important themes and issues in an interdisciplinary plan are shown simultaneously in association with one another. (Go to www.inspiration.com/home.cfm for software that can help you develop and visually display interdisciplinary units and lessons.)

The steps for creating these types of graphic outlines or webs follow:

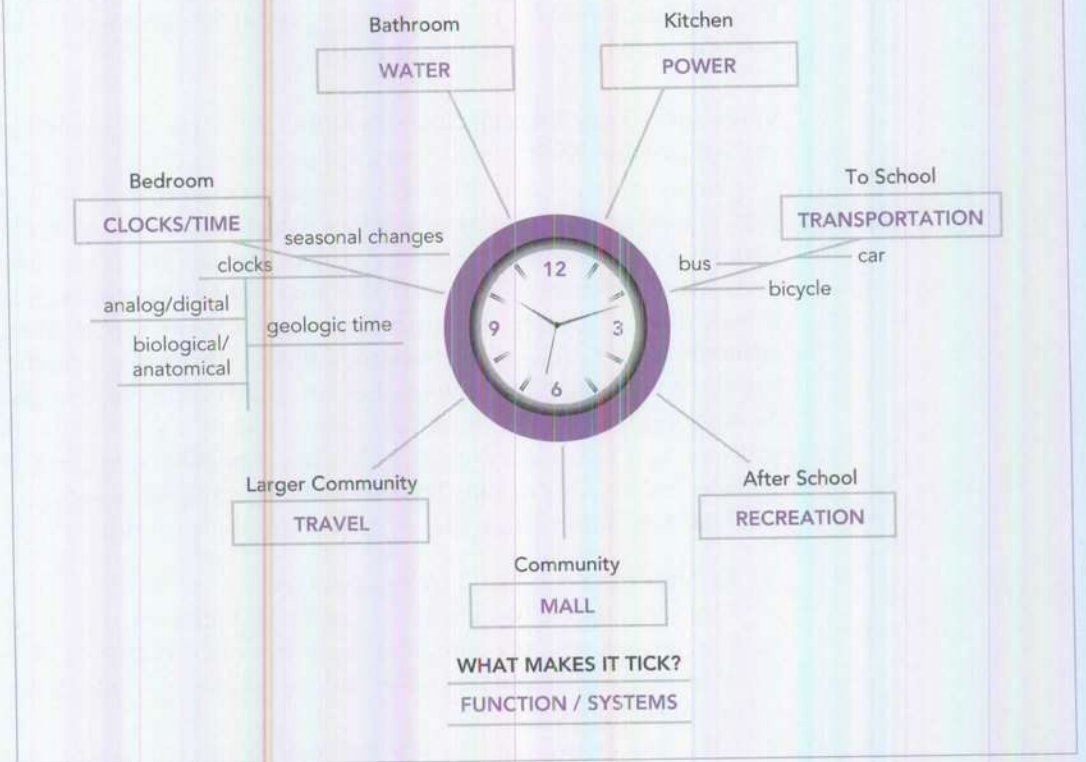
1. Identify the most essential theme or idea.
2. Write this theme or idea in the center of your web.
3. Use arrows or lines going out from the main theme or idea to show relationships with other subordinate issues, topics, or content, which can become the topics of individual lessons.
4. Label the arrows and all key concepts with code words or phrases to describe the relationships you have expressed.

Figure 4.8 Visual Representation of the Interdisciplinary Unit Theme "Adventures of Lewis and Clark"



Source: From *The Classroom of the 21st Century*, by S. Kovalik, 1994. Federal Way, WA: Books for Educators. Copyright © 1994 by S. Kovalik. Reprinted with permission.

Figure 4.9 Visual Representation of the Interdisciplinary Unit Theme "Dimensions of Time"



Source: From *Kid's Eye View of Science: A Teacher's Handbook for Teaching Science That Matters*, by S. Kovalik, 2002. Federal Way, WA: Books for Educators. Copyright © 2002 by S. Kovalik. Reprinted with permission.

Figures 4.8 and 4.9 provide examples of thematic webs for expressing an interdisciplinary thematic unit. See also In Practice: Focus on Interdisciplinary Lesson Planning.

The Written Unit Plan. The written format for an interdisciplinary unit plan is the same as that for a disciplinary unit. Recall that a written unit is divided into its (1) main purpose, (2) behavioral objectives, (3) content, (4) procedures and activities, (5) instructional aids and resources, and (6) evaluation methods. An example of a written interdisciplinary plan appears in Figure 4.10. To this written plan, attach the visual outline or web of your theme and its interrelationships. As was the case for your disciplinary lesson plan, be sure to add those resources, materials, and strategies (e.g., groupings) that you will use to differentiate your instruction for individuals or groups and to reach learners

Figure 4.10 Example of an Interdisciplinary Thematic Unit

Grade: 5

Unit Topic: Gold Rush

Course/Subject: Interdisciplinary

Approximate Time Required: One month

1. **Main Purpose of the Unit**
   The purpose of this unit is to acquaint the students with the excitement, the hardships, and the challenges of the nineteenth-century gold rush.

2. **Behavioral Objectives**
   The student will be able to:
   A. *History/Social Science*—Give reasons why people came to California in the 1840s.
   B. *History/Social Science*—Describe the three routes the pioneers took to California.
   C. *History/Social Science*—Compare life in the United States in the 1840s to life in the United States now.
   D. *History/Social Science*—List supplies brought by the pioneers on the trip West.
   E. *Language Arts*—Write a journal entry to describe some of the hardships associated with the trip West.
   F. *Science*—Research and write a report on how gold is mined.
   G. *Math*—Weigh gold nuggets (painted rocks) and calculate their monetary value.
   H. *Art*—Design a prairie quilt pattern using fabric scraps.

3. **Content Outline**
   A. Reasons people came to California in the 1840s
      1. Gold
      2. Job opportunities
      3. Weather
   B. Supplies for the trip
      1. Tools
      2. Personal supplies
      3. Food
      4. Household items
   C. Life on the trip West
      1. Weather conditions
      2. Roles of men, women, children
      3. Hazards of the trail
   D. Life in California after arrival
      1. Inflated prices
      2. Staking a claim
      3. Striking it rich
      4. A typical day in the life of a miner

4. **Procedures and Activities**
   A. Read aloud
   B. Small-group reading
   C. Independent reading
   D. Discussion
   E. Journal entries
   F. Measurement
   G. Cooking
   H. Singing

5. **Instructional Aids and Resources**
   A. Literature selections
      1. *Patty Reed's Doll*
      2. *By the Great Horn Spoon*
      3. *If You Traveled West in a Covered Wagon*
      4. *Children of the Wild West*
      5. *Joshua's Westward Journal*
      6. *The Way West, Journal of a Pioneer Woman*
      7. *The Little House Cookbook*
   B. Items indicative of the period (if obtainable)
      1. Cast-iron skillet
      2. Bonnet or leather hat
      3. Old tools

6. **Assessment/Evaluation**
   Develop a rubric to grade these.
   A. Essay—Choose one route that the pioneers took to get to California and describe the journey.
   B. Gold Rush Game Board—Design a board game detailing the trip to California. The winner arrives in California and strikes it rich!

Source: Written by Cynthia Kiel, teacher, Glendale, California.

IN PRACTICE

FOCUS ON INTERDISCIPLINARY LESSON PLANNING

In his literature class, Mr. Cline gives students the dates of the birth and death of a famous author and asks them to figure out how old the author was when she died. Silence falls over the class as students scratch their heads in frustration. One student exclaims, "It's hard to do math in English class!"

How often do we find our students reluctant or unable to recognize and use knowledge they already possess to help them solve new problems or understand new but related concepts? This phenomenon can be directly tied to the ways in which students initially learn information. In an educational era when tremendous emphasis is placed on specialized knowledge, the segregated clustering of subject-area instruction often prevents students from identifying important interconnections among the subjects they study.

The challenge for teachers is to find a healthy and meaningful balance between curricular breadth and depth. The long history of research on the ways in which students learn provides a strong rationale for the value of interdisciplinary instruction. Research in cognitive science strongly supports this view. The work of Ausubel (1968), Neisser (1976), and others in the 1980s and 1990s led to our current notion of schematic structures in the brain. These schematic structures—composed of hundreds, sometimes thousands of interconnected bits of information—serve as a framework for our knowledge. The goodness of our schematic structures is highly dependent on the way in which we initially process the information presented to us. Ausubel referred to these associations as "cognitive hooks." Instruction that provides students with links to connect otherwise discrete bits of knowledge enhances their ability to recognize and apply prior knowledge to new, related learning situations.

Obstacles to Interdisciplinary Lesson Planning

Although the development of integrated learning experiences is important, teachers often find it difficult to plan such experiences for students. The current emphasis on a whole-language orientation in the elementary curriculum assists us as we help students understand the relationships among reading, writing, and oral language, yet most school curricula retain a nonintegrated approach to subject-matter instruction. Textbooks and teachers' guides rarely emphasize the relationships between the subject area of major concentration and other disciplines. As a result, teachers have neither the information nor the time needed to realistically include interdisciplinary experiences in curricular planning.

Although we cannot always change existing middle and high school curricular materials rapidly or directly, we can employ a planning process that will allow us to periodically incorporate cross-disciplinary ideas and activities into our repertoire of instructional strategies.

Guidelines for Planning

Each of us has particular subject-matter expertise, and we have also accumulated knowledge and developed interests in other areas. Additionally, we have access to colleagues whose subject-matter concentrations differ from our own. Using these resources, we can conceptualize and construct instructional lessons that help students understand important and interesting relationships between the disciplines. The following guidelines can help us as we develop interdisciplinary lessons:

1. *Formulate a goal statement that indicates the principle(s) or concept(s) to be understood at the completion of the lesson.* What are the primary pieces of information or concepts that you want students to understand? Often interdisciplinary lessons do not concentrate on the mastery of specific skills. By their very nature, these lessons usually focus on the application of skills and knowledge to novel situations. For this reason, goals of interdisciplinary lessons will usually involve helping students understand how the skills and knowledge they possess can be combined to accomplish a task, discover a solution, or explain a situation.
2. *Select the primary content base that will serve as the catalyst for instruction.* Often the content base will be determined by the text. There are times, however, when your goal necessitates the use of other ancillary materials. In either case, determine the primary vehicle that will drive the instruction (e.g., a work of art or literature, a scientific or mathematical principle, an event or era in history, etc.).
3. *Identify events, discoveries, and writings within other disciplines that relate to the primary content base in a meaningful way.* Through talking with

colleagues and brainstorming on your own, consider information in other disciplines that seems to relate to the primary content. At this point, you may find it helpful to look at the table of contents in the textbooks you will be using. However, do not discount your own expertise, the films or plays you have seen, the books or magazine articles you have read, and your life's experiences.

4. *Determine the key points of intersection between the disciplines that correspond to the established terminal goal of instruction.* As you investigate each cross-disciplinary idea in more depth, keep your terminal goal well in mind. Often we become so enthralled in the idea itself that we lose sight of our major instructional intent. This is intellectually enjoyable, but it is a time-consuming luxury that few of us can afford. Some ideas will probably need to be discarded, either because they are too complex or because they do not fully address the goal. Other ideas may be so compelling and enlightening that you may want to revise the terminal goal to reflect the new insights you have gained.
5. *Formulate instructional objectives.* Most interdisciplinary lessons will not focus on the mastery of specific skills. Nevertheless, it is important to determine what you expect your students to be able to do when they have completed the lesson. As in other instructional planning, objectives serve as the springboard for the development of the instructional strategies and activities you will use.
6. *Identify the necessary prerequisite knowledge that students must possess in each discipline area you will address.* Interdisciplinary instruction can fall apart if students lack knowledge of the key principles or concepts within each discipline. Carefully consider the prerequisite skills students must have before they can successfully accomplish the objectives you have set forth. Sometimes missing skills or pieces of information can be taught rather quickly. However, when this is not the case, it will be necessary to revise the interdisciplinary content.
7. *Formulate instructional strategies that will compel students to use their knowledge in one discipline to better understand and appreciate another.* Students are not used to activating their knowledge in one discipline while studying another. For this reason, it is important to develop activities that require this transfer in a purposeful way. Depending on the content and timeframe of instruction, you may want to use concept mapping, in-class debates, group projects, and/or a variety of discovery techniques to accomplish your goal. The critical component of an interdisciplinary lesson, as in most instruction, is active and invested participation.

Giving our students opportunities to explore interconnections among the subject areas they are studying has many advantages. Interdisciplinary instruction adds meaning and relevance to learning, as students discover fascinating and compelling relationships between disciplines.

Source: Adapted from "Planning Interdisciplinary Curriculum: A Systematic and Cooperative Approach," by Carla Mathison and Cheryl Mason, San Diego State University. Paper presented at ASCD Annual Conference, Orlando, FL. Reprinted by permission.

with special needs. These, too, can be coded; add the codes at relevant places on your interdisciplinary unit map or written unit plan.

Making Lesson Plans

To achieve a thinking curriculum in your classroom, we have emphasized the importance of choosing some unit outcomes at a higher level of thinking (for example, application, analysis, synthesis, decision making), rather than specific lesson outcomes. If you plan lessons without a higher-level unit outcome in mind, your students' attention will fall exclusively on each individual lesson, without noticing the relationship among lessons. This relationship may appear deceptively unimportant until it becomes apparent that your lessons seem to pull students first in one direction (e.g., knowledge acquisition) and then abruptly in another (e.g., problem solving), without offering instruction to guide them in the transition. The results of such isolated lesson outcomes may well be confusion,

anxiety, and distrust on the part of your students, regardless of how well you prepare each individual lesson and how effective your lessons are in accomplishing their stated but isolated outcomes. Because higher-level outcomes rarely can be attained within the timeframe of a single lesson, they must be achieved in the context of a unit plan.

Before you actually write a lesson plan, consider two preliminary issues, which are necessary for your unit plan to flow smoothly: (1) determining where to start and (2) providing for learner diversity.

Determining Where to Start

Perhaps most perplexing to new teachers is deciding the level of learning at which a lesson should begin—for example, knowledge or comprehension or application. Do you always begin by teaching facts (instilling knowledge), or can you begin with activities at the application level or even at the synthesis and decision-making levels? Both alternatives are possible, but each makes different assumptions about the prior task-relevant knowledge of your students and the interrelationship among your lessons.

Beginning a lesson or a sequence of lessons at the knowledge level (e.g., list, recall, recite, etc.) assumes that the topic you will be teaching is mostly new material. Such a lesson usually occurs at the beginning of a sequence that will progressively build this knowledge into more authentic behavior—perhaps ending at the application, synthesis, or evaluation (decision-making) level. When no task-relevant prior knowledge is required, the starting point for a lesson often is at the knowledge or comprehension level. When some task-relevant prior knowledge has been taught, the lesson can begin at a higher level of thinking. Notice from the list of objectives in Figure 4.7 that each lesson with an outcome at a higher level is preceded by a lesson with an outcome at some lower level. The complexity with which a lesson can start depends on the learning outcome of the lessons that preceded it.

As we have seen, a unit plan should attempt to teach a range of outcomes that begin at a lower level and end at a higher level. Some units might begin at the application level and end at a higher level, if a previous unit has provided the task-relevant prior knowledge and understandings required. It also is possible to progress from one level of learning outcome to another within a single lesson. This may be increasingly difficult when lessons start at higher levels, but it is possible and often desirable to move from knowledge to comprehension and on to application activities within a single lesson. This is illustrated in the flow of behaviors for the following third-grade social studies lesson:

Unit Title: Local, State, and National Geography

Lesson Title: Local Geography

Behaviors

- Student will know the geographical location of the community relative to the state and nation (knowledge).
- Student will be able to describe the physical features of the community (comprehension).
- Student will be able to locate the community on a map and globe (application).
- Student will be able to discuss how the community is similar to and different from other communities (analysis).

In this lesson, a comprehensive list of outcomes is required in a relatively brief time (a single lesson) by using objects already known to the students (their own community, map, globe) and by interlocking one outcome with another, so each new activity is a continuation of the preceding one. When the teacher plans a transition across learning levels within a single lesson, the necessary question before each new level is, Have I provided all the required task-relevant prior knowledge? If the answer is yes, the lesson will be

directed at the students' current level of understanding, and they will have the maximum opportunity to attain the unit objective.

Providing for Learning Diversity

A second consideration before writing a lesson plan is providing differentiated instruction for individual learners and students with special learning needs. As we have seen in this chapter and Chapter 2, not all learners share the same behavioral characteristics and task-relevant prior knowledge.

Regardless of where you position the entry level of a lesson, some students will be above it and other students will be below it. Much of the work of unit and lesson planning is playing a game of averages, in which you attempt to provide most of the instruction at the current level of understanding of most of the learners. Unless an entire unit of study is individualized (as is the case with some computerized curricula), most instruction must be directed at the average learner in your classroom while attempting to meet the needs of other learners.

Many instructional methods and **tutorial and communication technologies** are available that can help you differentiate instruction and meet the needs of special learners (Gregory & Chapman, 2006; Karten, 2007; Tileston, 2004; Tomlinson, 2004; Tomlinson & McTighe, 2006). These methods and technologies share the following characteristics:

- Allow rapid movement within and across content, depending on the learners' success at any given time
- Allow students the flexibility to proceed at their own pace and level of difficulty
- Provide students immediate feedback on the accuracy of their responses
- Gradually shift the responsibility for learning from teacher to student

Before you begin your lesson plan, decide on the extent to which methods and technologies for individualizing instruction are required by the diversity of learning needs in your classroom. The following methods describe some of the options for helping all your learners achieve academic success. Be sure to include these methods in your lesson plan when they can contribute to the goals of your lesson.

Task-Ability Grouping. You can group your class for a specific period of time by the skills required to learn the material you are presenting. For example, higher-performing readers can read ahead and work independently on advanced exercises while you direct your lesson to average- and lower-performing readers. You can divide lesson plans, objectives, activities, materials, and tests into two or more appropriate parts when learners exhibit noticeable strengths and weaknesses that cannot be bridged in a single lesson. The intent is to group learners homogeneously by learning skills relevant to a specific task or lesson for a limited amount of time, after which you should regroup when new tasks place different demands on learners.

Learning Centers. Students tend to learn better when solving real-life problems. As a result, many schools are working to reorganize the curriculum to support real-world problem solving and application (Baden & Mayor, 2004; Boyer, 1993). One way to promote real-world problem solving and help individual learners apply what they have learned is through the use of a learning or activity center. A learning center can individualize a lesson by providing resources for review and practice for those who may lack task-relevant prior knowledge or skills. When a learning center can contain media, supplemental resources, and/or practice exercises directly related to applying your lesson content, include it as an integral part of your lesson plan. The more hands-on activity your learning center elicits from your learners, the more effective it will be in helping you achieve your lesson and unit goals.

Learning centers containing media, supplemental resources, demonstration materials, and exercises can help individualize a lesson for those who may lack the prerequisite knowledge or skills required at the beginning of the lesson. The use of learning centers should be indicated in the lesson plan whenever applicable.

Review and Follow-Up Materials. Some of your lessons will need to stimulate the recall of task-relevant prior knowledge. An oral summary, together with a supplementary handout that asks individual learners to look up the required information, can bring some students up to the required level while not boring others. The key to this procedure is to carefully prepare a summary and review sheet covering critically needed prerequisite knowledge for the day's lesson, such as important names, dates, concepts, themes, and formulas. Doing so lets you limit your review to the essentials and requires the least amount of time.

Tutoring. During **peer tutoring,** one student teaches another at the same grade and age level. During **cross-age tutoring,** the tutor may be one or more years and grade levels above the learner receiving the instruction. Cross-age tutoring generally has been more effective than peer tutoring, owing to the fact that older students are more likely to be familiar with the material and to be respected as role models. Tutoring has been most successful as an adjunct to regular instruction, usually in the form of providing a greater amount of instructional practice than can be provided in a whole-class or group setting.

Interactive Instructional CD-ROMs. Instructional CD-ROMs can provide computer-generated activities that students work through at their own level and at their own pace. CD-ROMs can also hold different soundtracks—for example, one in English and another in Spanish. These instructional CDs typically break skills down into small subskills, such as those that might be identified in a learning hierarchy, through which students work. Questions and prompts actively engage learners in formulating responses and give them immediate knowledge of whether they are correct, providing **interactive individualized practice activities.**

Interactive CD-ROMs are now available from publishers and commercial vendors for many different grade levels and content areas to give students practice, assess understanding, and provide remediation. These CD-ROMs can quickly assess the accuracy of students' responses to practice activities and change the sequence and difficulty of the activities to correspond with learners' current level of understanding. In this manner, practice can be tailored to individual learners, depending on how well they respond at a certain level of difficulty. Students can spend more time on a particular topic or skill, or they can return to an earlier sequence of instruction to review or relearn prerequisite knowledge. CD-ROMs also have the capability of providing color pictures, simulated motion, and charts and diagrams that can motivate learners and enhance the authenticity of the practice experience. As with other individualized learning methods, instructional CD-ROMs have been found most effective when providing practice opportunities for content that has already been taught.

Online and Desktop Simulations and Games. Students who need an alternative or supplementary means of attaining classroom objectives can use instructional simulations and games, either cooperatively or independently. Lessons may begin with whole-class instruction and then, depending on students' interests and abilities, provide instructional simulations and games to give students hands-on experiences that may remediate or enrich skills taught during full-class instruction (for example, for simulations across grade levels, see Aldrich, 2005; Grabe & Grabe, 1996; Shifflet & Brown, 2006; and Tomei, 2006). Textbook publishers are increasingly providing computer simulations and practice-based instruction that teaches performance skills relevant to your curriculum. Some of these curriculum supplements also can be used by learners in cooperative learning groups.

A number of instructional simulations and games have been developed to teach and assess problem-solving behavior from grades K–12. Among the most successful have been the AmericaQuest program, with its technology-based MashpeeQuest performance task, and a middle school science curriculum called ThinkerTools. (Go to http://quest.classroom.com and http://ott.educ.msu.edu/2002.ot3/thinkertools.htm, respectively.)

MashpeeQuest is an example of an online performance task used as a tool to assess problem-solving behavior within the context of an instructional program (AmericaQuest) that teaches learners the reasoning and problem-solving skills used by professional historians and archaeologists. The MashpeeQuest performance task is designed to assess the following problem-solving skills taught by the AmericaQuest program:

- Ability to synthesize disparate ideas through reasoning in a problem-solving context
- Ability to offer reasoned arguments rather than brief guesses
- Ability to formulate creative, well-founded theories for unsolved questions in science and history

The online performance task, as described by Mislevy, Steinberg, Almond, Haertel, and Penuel (2000) and the National Research Council (2001), is as follows:

> During instruction, students participate via the Internet in an expedition with archaeologists and historians who are uncovering clues about the fate of a Native American tribe, the Anasazi, who are believed to have abandoned their magnificent cliff dwellings in large numbers between 1200 and 1300. To collect observations of students' acquisition of the targeted skills, the MashpeeQuest assessment task engages students in deciding a court case involving recognition of another tribe, the Mashpee Wampanoags, who some believe disappeared just as the Anasazi did. A band of people claiming Wampanoag ancestry has been trying for some years to gain recognition from the federal government as a tribe that still exists. Students are asked to investigate the evidence, select Websites that provide evidence to support their claim, and justify their choices based on the evidence. They are also asked to identify one place to go to find evidence that does not support their claim and to address how their theory of what happened to the Mashpee is still justified. (National Research Council, 2001, p. 268)

One of the goals of the AmericaQuest program is to assist students in learning persuasive arguments for problem-solving supported by evidence from the program's website and their own research. Since the problem-solving skills and data that serve as evidence are embedded in the website, some of the assessments of student performance are made automatically by counting the number of sources used and the time spent examining each source. Other assessments involving the organization of evidence and its oral presentation are made by the teacher using a structured format provided by the program. The MashpeeQuest problem-solving task is a good example of the role technology can play in assessment and in presenting authentic learning tasks. Similar problem-solving tasks can be prepared by the teacher in the Internet-connected classroom.

ThinkerTools is another example of a program that harnesses the computer for teaching and assessment—this time, to promote metacognitive skills with which students assess their own and others' work (White & Frederiksen, 2000). ThinkerTools is a middle school science curriculum that teaches students how to formulate and test competing theories with experiments simulated on the computer. The software enables each learner to simulate experiments to accurately measure distances, times, and velocities and to compare findings and reach a consensus about the best explanation for different naturally occurring phenomena. As with the MashpeeQuest problem-solving task, the computer provides feedback to the student.

Most importantly, ThinkerTools focuses on development of the metacognitive skills needed to create and revise scientific explanations from evidence. The curriculum encourages students to reflect on their own procedures and choices in order to evaluate

their research using established scientific criteria, such as reasoning, problem-solving, and collaborative skills. The ThinkerTools program has been found to be effective in improving students' inquiry and problem-solving skills and in reducing the performance gap between low and high achievers in urban classrooms (White & Frederiksen, 2000). Both the AmericaQuest and ThinkerTools programs serve as good models of how online technology can be integrated into lesson planning.

Fiber Optics/Telecommunications. Fiber optics/telecommunications technology, also known as the Internet, offers the most opportunities to stimulate the senses through multimedia, making the learning environment more fluid and personalized. Often referred to as the **living curriculum,** the combination of laser technology and telecommunications has many of the same features of CD-ROMs, plus the added advantage that the subject matter being studied no longer must reside on a single disk inside a PC. Students can acquire information flexibly and instantaneously from communication superhighways, which can give individual learners rapid access to human and textual resources across schools, geographical locations, and the world.

With the aid of a computer, learners create their own living curricula with which to practice and apply the content learned. By having students select information networks and pathways and conduct searches that increasingly bring authentic detail and professional expertise, responsibility for retaining and applying content passes gradually from the teacher to learners and to the world outside the classroom, encouraging cooperative ventures with

Video Window

PEARSON myeducationlab
The Power of Classroom Practice
www.myeducationlab.com

Computers in the Classroom

In this video, you will find Sue teaching a lesson on graphing and math to her second-grade learners. Her students are positioned in small groups at six computer stations. Each group is given a different graphing and data-recording problem to solve and then left to work independently to find the solution to their problem with the use of their computer. You will see how Sue monitors and guides her students through their assignment, during which she fulfills the important functions of providing feedback and reinforcement. As you watch Sue's lesson, determine if it contained any of the following four criteria for the effective use of tutorial and computer technology. Describe one instance of each criteria that you find. How well do you believe Sue implemented these criteria?

- Students are allowed to move rapidly within and across content.
- Students can proceed at their own pace.
- Students receive immediate feedback as to the accuracy of their responses.
- The responsibility for learning is gradually shifted from teacher to student.

Go to the Assignments and Activities section of Topic 14: "Integrating Technology" in the MyEducationLab for your course and complete the activity "Computers in the Classroom."

Table 4.2 Integrating Technology into Different Content Areas

Content Area	Application
Reading/Language arts	• Software programs to develop basic reading skills • Word processing to teach writing skills • Internet search engines to develop basic research skills
Math	• Tutorial and drill-and-practice software to develop math facts • Graphing calculations to illustrate abstract or hard-to-visualize relationships • Software to illustrate and explore geometry concepts
Science	• Simulations to illustrate complex relationships • Data-gathering instruments to conduct experiments in and out of the lab • Internet links to access information and communicate with other scientists
Social studies	• Simulations to explore distant places and times • Online archives to access many years of social science research • Spreadsheets and databases to organize information

other students, professionals, and resources. Once established, these information pathways provide students with many opportunities, among which are the following:

- *Search beyond local libraries.* For example, browse through holdings on early flight in the Library of Congress, visually tour a space station circling in space, or ask questions of a curator at the Smithsonian National Air and Space Museum via electronic mail.
- *Become more specialized and focused on current issues.* For example, example a database being compiled by the *New York Times* on a fast-breaking story, scan a recent index of *Scientific American* for the latest advances on gene splicing, or communicate via electronic mail with a researcher stationed in Antarctica.
- *Cooperate with other learners at a distance to create class newspapers.* For example, team up with students in another school, state, or nation to share news of mutual interest on acid rain, deforestation, or the global economy.
- *Work with cross-age mentors outside the school.* For example, explore connections between academic work and job opportunities or see how principles and concepts are used at more advanced levels, such as in subsequent courses, in the workplace, or in different community contexts.

These methods and communication technologies are only some of the ways you can provide for students' diverse learning needs in your lesson plans.

To be effective, technology should be integrated across the curriculum (Roblyer, 2005). Table 4.2 suggests some technology applications in reading/language arts, math, science, and social studies, and Figure 4.11 indicates how media and new technologies were used to plan a differentiated multidisciplinary middle school unit plan. Visit the following website for more examples of differentiated unit and lesson plans for other grades and subjects: http://schools.dixonusd.org/gate/lessons.htm.

Events in Instruction

After you have determined where to start the lesson and how to provide for diverse learning needs, you are ready to begin planning your lesson. At this time, you will specify the key events that occur during the lesson—and for which you are responsible. By placing the responsibility

Figure 4.11 A Differentiated Multidisciplinary Middle School Unit Plan

This unit plan involves the subjects of art, language arts, computers, and the Internet. It is the final project at the end of a middle school social studies unit on Egypt to be completed over four class periods. The primary goals of the unit are to differentiate instruction by giving students different paths of increasing difficulty to show what they have learned about Egypt and to provide all students an opportunity for academic success.

This teacher composed multiple activities of 1, 2, 5, and 8 points—from which students can choose based on their own interests and capabilities—that when multiplied by 10 will comprise up to 100 points. Thus, an 8-point activity is worth 80 points. As the activities get more difficult and more time consuming, the point value increases. The teacher begins by encouraging higher-level students to choose 8-point activities. Students are also encouraged, however, to choose what interests them from a variety of options.

ACTIVITIES

Everyone must choose activities with point values that when multiplied by 10 will equal up to 100 points.

One-Point Activities

A. After viewing the interactive Egyptian Language Vocabulary CD on our classroom computer, define the following vocabulary words found in Unit 3 (Chapters 7, 8, 9) using your own words. Credit will not be given if the definitions are taken directly from the text.

   delta, pharaoh, Old Kingdom, Middle Kingdom, New Kingdom, Hyksos, scribes, pyramids, mummies, hieroglyphics, papyrus, Great Pyramid

B. Create a checklist of at least five items you would need to bring to your afterlife and provide reasons for why you would need them, using your knowledge of Egyptian culture. Be sure to add to your checklist drawings from the Art Learning Center that will show the class what these items look like. Share your checklist with the class to get feedback and suggestions

   For this activity, visit online: www.woodlandsjunior.kent.sch.uk/Homework/egypt/mummies.htm

C. Decorate a picture of King Tut at the Art Learning Center that will serve as an honor to him and his service to his country. Use different objects at the center to enhance the picture (e.g., glitter, beads, jewelry, colored rice, etc.).

Two-Point Activities

A. Create a crossword puzzle using vocabulary, dates, places, and other information about Egypt. You must have a minimum of 12 words and clues.

   For this activity, visit online: www.historyforkids.org/learn/egypt

B. Create a colorful map of Egypt. Label the following places, and be prepared to tell the class about their significance or how they relate to Egypt. (You will share your map with the class.)

   Nile River, Nile Delta, Mediterranean Sea, Red Sea, Sahara Desert, Thebes, Giza, Memphis, Phoenicia, Mesopotamia

   For this activity, visit online: www.ancient-egypt-online.com/ancient-egypt-maps.html (Click on "Maps")

C. Go online to research the Aswan High Dam. Give a brief summary of the dam (about one paragraph), and then tell whether you believe the dam should have been built. Provide at least three reasons why you think the way you do.

   For this activity, visit online: http://carbon.cudenver.edu/stc-link/aswan1 and www.mbarron.net/Nile/envir_nf.html

D. Follow the recipe for Egyptian bread on the board. Make the bread in your own home, and bring it in for tasting on our presentation day. If you choose this activity, a letter will be sent home for your parents to sign, agreeing that they will provide the ingredients and assist you with the baking.

E. Consult materials at the Reference Learning Center, and choose five pharaohs from Egyptian history to read about. Make up one quote that each of the five pharaohs might have been heard saying. Present your quotes to the class, and have them try to guess which pharaohs you are portraying.

   For this activity, visit online: www.ancient-egypt-online.com/ancient-egypt-maps.html (Click on "Egyptian Pharaohs")

F. Make a Venn diagram showing the differences and similarities between Egyptian civilization and Mesopotamian civilization. Based on what you have listed, create a symbol to represent each civilization. Share your symbols and diagram with the class for feedback and suggestions.

Five-Point Activities

A. Create a game based on the Egyptian number system. The game needs to be interesting and simple to play. Make the game so that when you present it to the class, everyone can participate.

B. Create a hieroglyphics crossword puzzle. You must develop symbols for at least 15 of the 26 letters of our alphabet. Your clues must be in hieroglyphic format, but the answers can be translated into English. The crossword puzzle must include terms and information about Egypt. You must have a minimum of 8 words and clues.

Figure 4.11 Continued

For this activity, visit online: www.ancient-egypt-online.com/ancient-egyptian-pyramids.html (Click on "Hieroglyphics") and www.thekeep.org/~kunoichi/kunoichi/themestream/glyphs_1.html

C. Make a pyramid pop-up book. Your book must include information about Egyptian pyramids (including what they were used for, how they were made, and what you would find inside them). It also must have illustrations, text describing the illustrations and pictures of the pyramids, and at least one pop-up per page. Your book must be at least four pages. Share your book with the class for feedback and suggestions.

For this activity, visit online: www.nationalgeographic.com/pyramids/pyramids.html and www.ask-aladdin.com/pyramid.htm

D. With a partner, write a script and role-play the decision-making duties of the pharaoh. The pharaoh's most important task was to establish truth, order, and justice throughout the land. In ancient Egypt, the pharaoh's word was law. One of you will act as the pharaoh. The other will present two grievances to be brought to the pharaoh in front of the class. Partners must write out a detailed description of the case to be presented before the pharaoh (to be handed in). The pharaoh must then make a ruling based on the merits of the case presented.

Here are some possible ideas for grievances:

A slave has attempted to escape from a cruel master

A servant refuses to do as commanded

Someone is overheard questioning one of the pharaoh's decisions

A farmer wants to be excused from work on the pharaoh's pyramid

A wealthy lord kills your servant with his chariot

Eight-Point Activity

Half of those choosing this 8-point activity will start with Part I, and the other half will start with Part II. Those who have completed Part II will serve as consultants to those beginning Part II, and those who have completed Part I will serve as consultants to those beginning Part I. Each student must complete both Parts I and II.

For this activity, visit online: www.ancient-egypt-online.com/ancient-egyptian-pyramids.html

Part I. Create an essay comparing and contrasting the civilizations of Mesopotamia and Egypt. Write about how they are similar and different. Your essay must include (but is not limited to) the clothes people wore, what they ate, whom they worshipped, what they contributed to society, how they were educated, and what work they did.

Which civilization do you think was more successful? Why?

Which civilization contributed more to our modern way of living? Why?

Give evidence to support your claims.

Part II. Choose one pharaoh from the ancient Egyptian time period. Write an essay detailing his life. Did he marry? How many children did he have? How and when did he become pharaoh? Describe some of the significant events that occurred during his years of reign.

For this activity, visit online: www.ancient-egypt-online.com/ancient-egypt-maps.html (Click on "Egyptian Pharaohs")

Your essay (Parts I and II combined) must be a minimum of 1½ pages (approximately 800 words), single spaced.

Source: Contributed by Natalie Doverspike.

for providing these events on you, we distinguish between teaching and learning. *Learning* refers to the internal events that go on inside your learners' heads. *Teaching* is the sum of the instructional activities you provide to influence what goes on in your learners' heads.

The sequence of steps you follow in lesson planning assumes that the instructional events you plan will influence learning. It is not unusual for teaching to be unrelated to learning, as when teachers teach and students listen but nothing sinks in. The process of getting instructional events to sink in is one of planning instruction that fosters a close relationship between the external events of instruction (what you do) and the internal events of learning (what your students are thinking), actively engaging your learners in the learning process.

To begin, you can achieve this tightly knit relationship between what you do and what your students are thinking by considering the following questions. Your answers to these questions will serve you well in the lesson-planning steps that follow.

Getting Started: Some Lesson-Planning Questions

- What do you want students to know and be able to do?
- To what state standards and curriculum guide will this content relate?
- Why would your students care or want to know about this topic?
- How will you know when your students have achieved the goal of the lesson?
- What student needs, interests, and prior learning will be a foundation for this lesson?
- What engaging and worthwhile learning tasks will you ask your students to complete?
- What instructional practices will you use with this lesson to provide evaluative feedback?

In case you didn't notice, your answers to these questions will bring your students center stage into the planning process and organize in advance much of the information you will need to complete your lesson plan with the best interests and needs of your students at heart.

Next, you can further tighten the relationship between teaching and learning by considering seven instructional steps or events, as suggested by Gagné and Briggs (2005). These steps include the most relevant parts of other models of lesson preparation that, when used together, can provide the foundation for you to build your own model of lesson planning—one with which you will be most comfortable. Although not all of the events in different models of lesson planning are applicable to every lesson, they provide a basis or menu on which you can formulate many different lesson plans. Let's consider the types of instructional activity described by Gagné and Briggs (2005) and how you can actively engage your learners in the learning process with them. Related terms and lesson-planning questions appear in parentheses and in italics.

1. Gaining Attention (Anticipatory Set)

Why would your students care or want to know about this topic?

Unless you get your students' attention, they will hear little of your lesson, let alone become actively engaged in the learning process. Thus each lesson plan begins with an instructional event to engage student interest, curiosity, and attention. In some classes, this will mean raising your students' attention from almost complete disengagement to where their vision and hearing are receptive. In other classes, this may mean raising their attention from an already receptive mode to a higher level of curiosity, interest, and attention.

The intensity of your attention-gaining event will depend on the starting point of your learners. A fifth-period class that meets after lunch may require a more dramatic attention-getting event than an eager first-period class. You will need to find the right event for gaining your students' attention.

One of the most common attention-gaining devices is to arouse curiosity. Often this can be accomplished by asking questions:

- Have you ever wondered how we got the word *horsepower?* Who would like to guess? (from a lesson on energy)
- Can anyone think of a popular automobile with the name of a Greek god? (from an introductory lesson on mythology)
- Have you ever wondered how some creatures can live both in the water and on the land? (from a lesson on amphibious animals)

These questions, called *openers,* are designed not to have a single correct answer or even to accurately reflect the fine details of what is to follow. Instead they amuse, stimulate, or even bewilder students so that they will be receptive to the content and questions that follow. Following are other thought-provoking openers:

- Why do some scientists think that traveling to other planets will make space travelers younger? (from a lesson in general science or physics)
- Why do we have the word *i-t-s* and another word *i-t apostrophe s?* (from a lesson in punctuation)
- Why is the U.S. dollar worth more today in Mexico than in Switzerland? (from a lesson in social studies)
- Why do you think some eloquent lawyers become disliked by the juries they speak to? (from a lesson in public speaking)

Another useful technique for gaining students' attention is to present any of the following:

- An apparent *contradiction:*

  Why do you think the Greek empire collapsed when it was at its strongest?

- A seeming *inconsistency* in real life:

  Why do some lower forms of animal life live longer than human beings?

- Something that at first appears to be *illogical:*

  Why must one thing go backward every time something else goes forward?

For example, introducing a lesson about signed numbers by informing your learners that the multiplication of two negative numbers always results in a positive product may puzzle them, but it may also arouse their curiosity about how two negatives can result in something positive. You might continue by explaining the number line and mathematical rules behind this apparent contradiction.

Diagrams, pictures, illustrations, scale models, and films are other attention-getting aids. Use these devices to appeal to your learners' sense of vision while your oral presentation appeals to their sense of hearing. Graphics or visuals are particularly effective openers with students who are known to be more oriented and responsive to visual than auditory presentations. A visual opener might include samples of materials for the day's lesson, so students can touch them before the lesson begins. A visual opener also might show equipment you will use during the lesson (e.g., scales, meters, pictures, and models).

2. Informing Learners of the Objective (Anticipatory Set, Objectives, and Purpose)

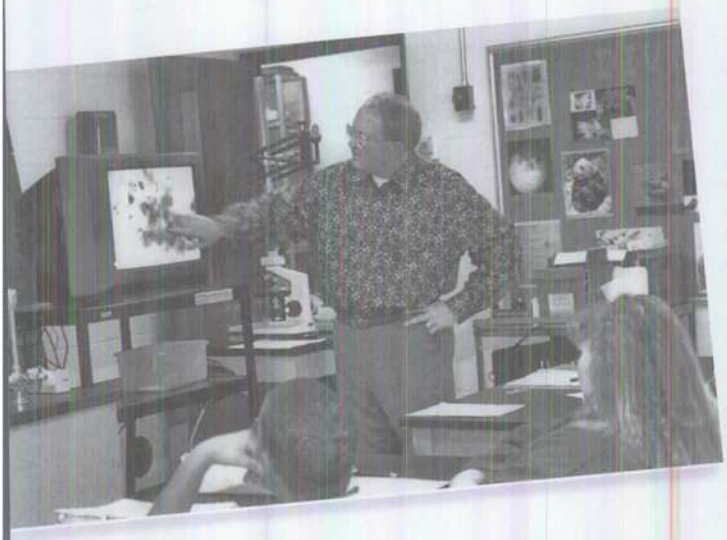
What do you want students to know and be able to do?

Just because your learners have been turned on with some attention-getting device does not mean they will be tuned to the wavelength at which you present the lesson. Next you need to tell them the channel on which your lesson is being transmitted.

The most effective way to focus your learners' receptivity is to inform them of the behavioral outcome they will be expected to attain by the end of the lesson. You can do this by telling them early in the lesson or unit how they will be examined or expected to show competence. For example, such an expectation might be expressed in any of the following ways:

- Remember the four definitions of *power* that will be presented. (science)
- Be able to express ownership orally in a sentence to the class. (language arts)
- Correctly identify a mystery specimen of lower animal life using the microscope. (life science)
- State your true feelings about laws dealing with the death penalty. (social studies)

Such statements allow learners to know the level of behavior they are expected to attain and to become selective in how to use and remember the lesson information. If your students are told they will be expected to recall four definitions of power at the end of



Before the actual presentation of new content begins, the necessary task-relevant prior information must be retrieved and made ready for use. This can be accomplished by reviewing, summarizing, and restating, stimulating into action the key concepts acquired in previous lessons.

your lesson on energy, then they will know to focus their search, retrieval, and retention processes during the lesson on the definitions or categories of power you present. Informing learners of your objective helps them organize their thinking in advance of the lesson by providing mental hooks on which to hang the key points. This activates the learning process and focuses your learners on obtaining the required behavioral outcome.

The key to the success of this instructional event is to communicate your objective clearly. To do so, choose your words with your learners' vocabulary and language level in mind, and record what you tell them as a reminder in this second part of your lesson plan.

The best way to communicate your objective is to provide examples of tasks that you expect your students to be able to perform after the lesson. This translates the action verb associated with a learning outcome into some ways this behavior might be measured on tests, in class discussions, and in question-and-answer sessions. For example, at the beginning of a unit on lower forms of animal life, you might write on the blackboard the following examples of expected outcomes and then check off the ones that most apply at the start of each day's lesson:

- ✓ Define an amoeba.
- ✓ Draw the cellular structure of an amoeba.
- _____ Explain the reproduction cycle of an amoeba.
- _____ Using a microscope, properly distinguish an amoeba from other single-celled animals.

Notice that these lesson outcomes range from recounting a fact to making decisions and judgments in a real biological environment.

Without knowing in advance at which of these levels they are expected to perform, your learners will have no way of selecting and focusing their attention on those parts of the instruction leading to the desired behavior. This is not to say students should ignore other aspects of the presentation. Rather, students can now see the other aspects as tools or means for gaining the highest-level outcome required, not as ends in themselves.

3. Stimulating Recall of Prerequisite Learning (Review)

What student needs, interests, and prior learning will be a foundation for this lesson?

Before you can proceed with the new lesson content, one final preliminary instructional event is needed. Because learning cannot occur in a vacuum, the necessary task-relevant prior information must be retrieved and made ready for use. This calls for some method of reviewing, summarizing, restating, or otherwise stimulating the key concepts acquired in previous lessons. This information is instrumental for achieving the level of outcome intended in the present lesson.

For example, if your goal is to have learners use a microscope to properly distinguish an amoeba from other single-celled animals, some previously acquired facts, concepts, and skills are clearly relevant to this new task. Definitions of single-celled animals, unique characteristics of an amoeba that distinguish it from other one-celled animals, and skill in using the microscope are among the task-relevant prior knowledge that will influence your learners' attainment of this outcome.

Helping students retrieve earlier information requires condensing the key aspects into a brief, easily understood form. It is not possible to summarize all of this information in

a few minutes. Instead you need to use thought-provoking and stimulating techniques to focus learners on sizable amounts of prior learning and interests. Questions like these can help your students recall the most significant and memorable parts of earlier lessons:

- Do you remember why Joshua couldn't see the amoeba in the microscope? (It was on low magnification instead of high.)
- Do you remember Natasha's humorous attempt to relate the reproduction cycle of an amoeba to that of human beings? (She had equated cell division with waking up one morning to find a new baby in the family.)
- Do you remember the three-color picture Rico drew of the cellular structure of an amoeba? (Everyone had commented on how lifelike the picture was.)

Questions such as these help students retrieve task-relevant prior learning, not by summarizing that learning but by tapping into a single mental image that recalls that learning. Once the image has been retrieved, students can turn it on and off at will to search for details that may be nestled within it, achieving still greater recall. Describing how to stimulate the recall of prerequisite learning, then, is the third entry in your lesson plan.

4. Presenting the Content (Input, Modeling)

What state standards and curriculum guide content will be taught? What instructional practices will you use with this lesson?

Presenting the content will be the heart of your lesson plan. At first glance, this component may seem to require little explanation, but several important considerations for completing it often go unnoticed. These pertain to the authenticity, selectivity, and variety of your lesson presentation. Let's look closely at each of these.

Authenticity. To teach a behavior that is authentic, your lesson must present content in a way in which it will be used by your learners on assessments, in subsequent grades, and in the world outside your classroom. If your goal is to teach learners to *use* a microscope to identify single-celled animals, then teaching them to *label* the parts of a microscope will not be authentic. Although naming the parts may be a prerequisite skill and an important objective of an earlier lesson, it will not be sufficient to attain the desired goal of this lesson. In other words, how you use a behavior in daily life must always be how it is taught in order for it to be authentic. Reading in the context of a story is also an example of an authentic behavior, because the learner is being provided the opportunity to derive meaning from text, as would be expected in the real world.

You can make the behaviors you teach more authentic by changing the irrelevant aspects or context of what you are teaching as often as possible and in as many different ways as possible. Doing so prevents learning a response under only one condition but not under others that may be encountered in subsequent lessons, grades, and courses. Following are examples of changing the irrelevant aspects of a learning stimulus:

- Show both the stacked format and line format of number problems. (math)
- Introduce learners to examples of proper punctuation by using materials from popular magazines and newspapers as well as the text and workbook. (English or a foreign language)
- Show how the laws of electricity apply to lightning during a thunderstorm as well as to electrical circuitry in the laboratory. (science)
- Relate the rules of social behavior found among humans to those often found among animals. (social studies)
- Compare the central processing unit in a computer to the executive processes in the human brain. (computer science)
- Show how the reasons for a particular war also can be applied to other conflicts hundreds of years earlier. (history)

In each of these examples, the lesson designer is applying key lesson ideas in different contexts. As a result, learners are more likely (1) to focus on correct mathematical operations and not the format of the problem, (2) to notice improper punctuation when it appears in a popular publication, (3) to understand the universality of physical laws governing electricity, (4) to realize that social behavior is not a uniquely human phenomenon, (5) to distinguish the wonders of data processing from the hardware and equipment that are sometimes needed to perform it, and (6) to understand that some reasons for conflict, war, and hostility are general as well as specific.

Selectivity. A second consideration during this stage of lesson preparation is emphasizing the content most important to your lesson. Not everything in a chapter, workbook, film, or presentation or on a handout or chalkboard will be of equal importance to the day's objective and standards. Consequently, highlighting key aspects of the material at the beginning of the lesson will help students selectively review and retain the main points of your lesson. For example, focusing your learners on the "six concepts on the bottom of page 50" or the "tables and figures at the end of Chapter 3" can help them place the day's lesson in the context of the curriculum and provide an anchor for future reference.

You will also want to highlight content during your lesson. Examples of such highlighting include verbally emphasizing the importance of certain events; telling students what to look for in a video (even stopping it to reinforce an idea); emphasizing key words on the chalkboard with underlining, circling, or color; and using verbal markers ("This is important"; "Notice the relevance of this"; "You will need this information later"). These and other methods for selectively emphasizing key parts of your lesson will be taken up in later chapters, but remember to consider them at this stage of your lesson plan.

Variety. A key behavior of the effective teacher is instructional variety. Gaining students' attention at the start of the lesson is one thing, but keeping their attention is quite another. Variety in the modalities of instruction (for example, visual, oral, tactile) and instructional activity (large-group lecture, question and answer, small-group discussion) stimulates student thinking and interest. Shifting from visually dominated instruction to orally dominated instruction (or using both simultaneously) and breaking a lesson into several instructional activities (for example, explanation followed by question and answer) are important.

Planning changes in modality and instructional activities presents the lesson in varied contexts, giving learners the opportunity to grasp material in several different ways according to their individual learning styles. Such changes also give students the opportunity to see previously learned material used in different ways. This reinforces learned material better than simply restating it in the same mode and form. It also encourages learners to extend or expand material according to the new mode or procedure being used. For example, material learned from a presentation may be pushed to its limit in a question-and-answer period when the learner answers a question and finds out that previous understandings were partly incorrect due to the limited context in which they were learned.

In addition to keeping students attentive and actively engaged in the learning process, providing variety also creates a more memorable and conscious learning experience. Be sure to consider these and other methods of adding instructional variety to your lesson during this stage of your lesson plan.

5. Eliciting the Desired Behavior (Checking for Understanding, Guided Practice)

What engaging and worthwhile learning activities and tasks will your students complete?

After presenting the content of the lesson, provide your learners an opportunity to show that they have acquired the knowledge or understanding expected. Learning occurs in an active environment that engages the learner in the learning process at moderate to high rates of success.

Therefore a fifth instructional event is needed that, when added to a lesson plan, encourages and guides learners through a process that can be expected to exhibit the outcome intended.

This fifth event—eliciting the desired behavior—differs from the four preceding ones in that it seeks the individual's covert and personal engagement in the learning process. Each learner must be placed in the position of grappling in a trial-and-error fashion with summarizing, paraphrasing, applying, or solving a problem involving the lesson content. It is not important that the learner's response be produced accurately at this stage, as long as the activity provided stimulates him or her to attempt a response. This activity guides the learner to organize a response that matches the learning outcome stated when the student was informed of the objective (the second instructional event).

The primary ways of staging this instructional event include workbooks, handouts, textbook study questions, verbal and written exercises, and oral questions that have students apply what was learned, if only in the privacy of their minds. The goal is to pose a classroom activity that encourages students to use the material taught in a nonevaluative atmosphere, as close in time as possible to the presentation of new material. Sometimes such activities can be inserted throughout the lesson with each new chunk of information, which also adds variety. In other instances, these activities occur near the end of the presentation of content.

Either way, the eliciting activity is brief, nonevaluative, and focused exclusively on posing a condition for which the learner must organize a response (e.g., from a question, problem, or exercise). This response may be written, oral, or subvocal (students respond in their own minds). An eliciting activity can be as simple as your posing a question anywhere in a lesson or as complex as the student completing a problem or exercise in a workbook at the lesson's end. The main attribute is that the activity be nonevaluative to encourage a response unhampered by the anxiety and conservative response patterns that generally occur during testing situations.

You may also want to consider some of the followings ways of eliciting the desired behavior, as suggested by Kauchak and Eggen (2006), Rosenshine and Stevens (1986), and Zemelman, Daniels, and Hyde (2005):

- Prepare a large number of oral questions beforehand.
- Ask many brief questions on main points, on supplementary points, and on the process being taught. (Have students create their own questions.)
- Call on students whose hands are not raised in addition to those who volunteer.
- Ask students to summarize a rule or process in their own words.
- Have all students write their answers (on paper or the chalkboard) while you circulate among them.
- Have all students write their answers and check them with a neighbor. (This is frequently used with older students.)
- At the end of a presentation/discussion (especially with older students), write the main points on the chalkboard, and then divide the class into groups to summarize the main points together.

6. Providing Feedback (Guided Practice, Closure)

What instructional practices will you use with this lesson to provide evaluative feedback?

The sixth instructional event is closely connected in time to the fifth event (eliciting the desired behavior) and is often used consecutively with it. As we have seen, eliciting the desired behavior promotes learning to the extent that learners struggle with and think about providing a correct response. The response is the individual's attempt to recall, summarize, paraphrase, apply, or problem solve in a *nonevaluative* way, which maintains his or her momentum to learn. Feedback may be provided but should be directed to the entire class or subgroups of learners who may be working at different levels. For example, after giving learners time to think on their own, the teacher can give the correct answer to the class, group several students' answers for comparison, read aloud the correct answer from where it can be found, provide a handout with the correct answer,

Table 4.3 Some Methods of Providing Feedback

Individual Students	Small Groups	Whole Class
Nod while walking past	Sit with the group and discuss their answers	Place the answers on a transparency
Point to the correct answer in the workbook or textbook	Have one group critique another group's answers	Provide the answers on a handout
Show the student the answer key	Give each group the answer key when finished with discussion	Read the answers aloud
Place checkmarks along incorrect answers	Assign one group member the task of checking the answers of other group members	Place the answers on the chalkboard
Have selected students read their answers aloud		Have students grade each other's papers as you give the answers
Have students grade each other's papers by using the text, or assign references as a guide		

or use a transparency to record volunteered answers—all nonevaluative ways of leading the learner to reengage and rethink an earlier response.

But at this sixth stage of the learning process, it is important to provide *individual* student feedback as to the correctness of a response or how to make it better. Here your response to the learner is differentiated by considering his or her ability, learning history, language and culture, and, if applicable, special needs. Responses such as "That's a good try," "That's not quite what I'm looking for at this time," and "Keep thinking" can switch the focus of a wrong answer to a more productive response and provide the opportunity to give the individual learner specific feedback without penalizing him or her for responding. If students are working silently at their seats, you can walk about the room, using a simple nod and smile to indicate the correctness of an individual performance or to encourage the revision of a wrong response. This part of the lesson plan provides the means by which evaluative feedback can be given to learners about the adequacy of their individual responses.

Some additional ways of providing feedback to individual students, small groups, and the entire class are summarized in Table 4.3.

7. Assessing the Lesson Outcome (Independent Practice)

How will you know when your students have achieved the goal of the lesson?

This final instructional event specifies the way in which you will make a final evaluation of the degree to which the learner has acquired the desired behaviors, which may include the outcomes of other lessons as well. As we have seen, eliciting activities and feedback can be immediate or delayed (an oral question or workbook problem) and nonevaluative or evaluative (a choral versus individual response). For this instructional event, you will need to identify a delayed activity that is primarily evaluative.

Your assessment activities can include scored interviews, objective and essay questions, graded homework, classroom performances, and student work samples. These more formal evaluative tasks could be counterproductive to learning if required at earlier stages, when the instructional goal is to get learners to respond for the first time without limiting discovery, exploration, and risk taking—all important ingredients to meaningful learning. But these tasks are instrumental for evaluating the degree to which the learner has attained the desired behavior at the completion of a lesson or sequence of related lessons.

Some additional methods of completing this event include the following:

Tests and quizzes	Performance evaluations	Essay questions
Homework exercises	Lab assignments	Research papers
In-class workbook assignments	Presentations	Independent practice
	Oral questioning/interviews	Portfolios

EXAMPLE LESSON PLANS

We are now ready to collect our seven instructional events into a brief but effective lesson plan. To be both practical and effective, a lesson plan must be short yet provide all the ingredients needed to deliver the lesson.

Following are some example lesson plans on various subjects and grade levels that show how easy lesson planning can be when the task is organized using these seven instructional events. Let's review the events and look at some examples.

Example Lesson Plan

Reading Skills

Unit Title: Word Attack Skills (Vertically Planned Unit)

Lesson Title: Sound Discrimination, Letters of the Alphabet—Lesson 2.1

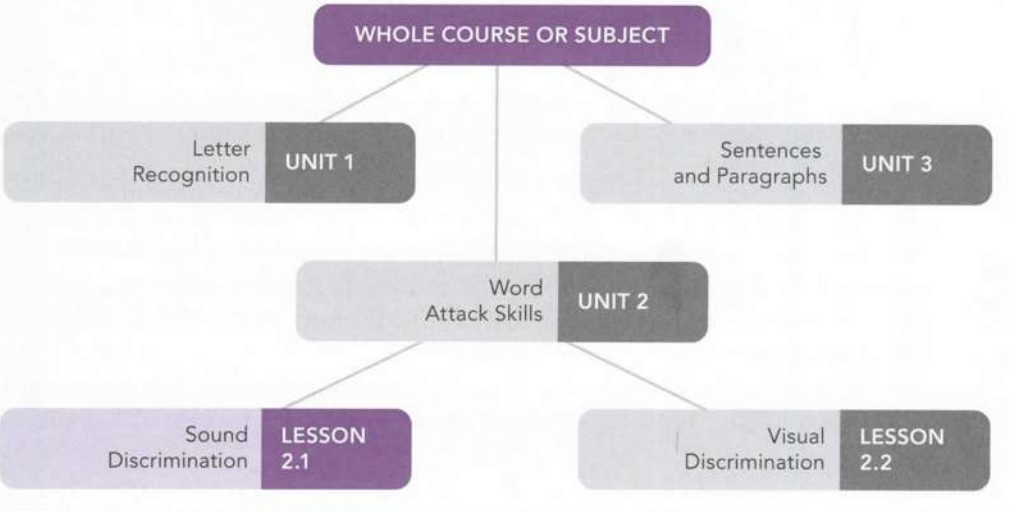
The preceding titles indicate the general content of the lesson and its placement in a unit on word attack skills. The lesson identifier, 2.1, indicates this lesson is the first one in unit 2. It would appear on the graphic unit plan, as indicated in Figure 4.12.

Next appears a description of how you will use each of the seven instructional events to deliver this lesson to students. To this is added some elaboration that further defines each event:

1 **Gaining attention.** Play an audiotape of a voice articulating the sounds.

This instructional event gains student attention and focuses learners on what is to be presented. Whatever device or procedure you use should not only gain their attention but also motivate their continued concentration well into the lesson. Keep in mind that students, especially young ones, have trouble picking up subtle transitions between classroom activities. Often their attention is steadfastly focused on what has immediately

Figure 4.12 Relationship of Lessons, Units, and a Course or Domain



preceded the lesson, and they are reluctant to change focus unless something new, interesting, or exciting is forthcoming.

Visual or auditory stimuli often are effective as attention getters, because their ability to penetrate the senses exceeds that of more neutral stimuli, like written words, verbal expressions, and pronouncements. Changing sensory modalities from listening to looking (or vice versa) often provides the incentive necessary for students to more selectively perceive and receive the message about to be communicated.

2 **Informing the learner of the objective.** When the tape is finished, indicate that at the end of the lesson, students will be expected to repeat the vowel sounds out loud, independently of the tape.

This instructional event translates the behavioral objective for the lesson into a form that is meaningful to students. In this example, information is being transferred from one modality (listening) to another (speaking), indicating that the objective for this lesson is written at the comprehension level of the cognitive domain, requiring a change in modalities. Your attention-getting device should be chosen to lead into the objective for the lesson. Simply clapping your hands to gain attention, followed by stating the objective, will not be as effective as having the objective actually contained within the attention-getting procedure.

In this example, the audiotape was directly related to the lesson's content, allowing these two instructional events to work together to produce a unified theme and thus enhancing learners' attention. Other simple but effective attention getters that could be made to reflect the lesson objective are a picture or chart, a question on the chalkboard, or a demonstration derived directly from lesson content.

3 **Stimulating recall of prerequisite learning.** Show how each vowel sound is produced by correctly positioning the mouth and lips.

Identifying and successfully communicating task-relevant prior knowledge to students is critical to attaining the lesson objective. Unless you paraphrase, summarize, or otherwise review this information, at least some students will be unable to comprehend what is being conveyed. Among the most frequent reasons that learners are unable to attain lesson outcomes is that they lack the skills and understandings of previously taught lessons that are necessary for subsequent learning to occur.

Prerequisite content must be recalled or stimulated into action for it to play a meaningful role in acquiring new learning. Most lessons require some previous facts, understandings, or skills, and these should be recalled and identified at this step of the lesson plan. You can achieve this by touching on the key points of the prior learning.

4 **Presenting the content.** Say each vowel sound, and then have the class repeat it twice, pointing to a chart of the positions of the mouth and lips during the articulation of each vowel sound. Do the most commonly used vowels first.

You may feel this is the heart of the lesson. You are partly right, except that there are six other "hearts," each of which could entail as much effort in planning and instructional time as this event does. Beginning teachers tend to pack their lessons with almost entirely new content. They devote far less effort to gaining learners' attention, informing learners of the objective, recalling prerequisite learning, and other instructional events that must follow the presentation of new material.

The presentation of new material is indispensable in any new lesson, but it need not always encompass most (or even a large portion) of the lesson. The result of devoting a

large portion of the lesson to new material, exclusive of the other instructional events, is that the lesson is likely to present the content in pieces too big for learners to grasp. This often results in having to reteach content during subsequent lessons and ultimately less content coverage at the end of a unit. The next three instructional events will make clear that new content must itself be a stimulus for something more to come.

5 **Eliciting the desired behavior.** Have students silently practice forming the correct mouth and lip positions for each vowel sound, following the pictures in their workbooks.

For this instructional event, the learner is given guidance in how to perform the behavior and an opportunity to practice it—two activities that must go hand in hand if learning is to occur. Eliciting the desired behavior for the first time without providing an opportunity to practice could diminish the effect of this instructional event. The content described in the previous event should be presented in a form that affords the learner the opportunity to use the behavior in a nonthreatening, nonevaluative environment. Grading or performance evaluations, therefore, should not be part of the performance being elicited in this instructional event, where spontaneity, the freedom to make mistakes, and an opportunity to discover for oneself should prevail.

6 **Providing feedback.** Randomly choose students to recite the vowel sounds; correct their errors to demonstrate to the class the desired sounds.

Feedback should be given immediately after the eliciting activity. The closer the correspondence between performance and feedback, the more quickly learning will occur.

Your feedback can be part of the eliciting activity, or it can be a separate activity. In the previous instructional event, feedback was not provided and learners had no way of knowing the correctness of their behavior (mouth and lip movements). Pictures in the text guided their behavior, but because students could not see themselves performing the movements, they could not tell if they performed them accurately. In this case, feedback would have to follow the eliciting activity, making this instructional event essential for learning. The previous eliciting activity, however, might have included impersonal and nonevaluative feedback if, for example, students were asked to recite aloud the vowel sounds and the teacher provided group feedback on the accuracy of their utterances. The correspondence of an eliciting activity and feedback is a matter of degree, but these two events should occur as closely in time as possible.

7 **Assessing the lesson outcome.** The lesson outcome will be assessed as part of the unit test on word attack skills and from the exercises completed on pages 17 and 18 in the workbook.

Few lesson objectives are assessed by individual lesson tests. An amount of content larger than that contained in a single lesson usually is necessary to make a test efficient and practical. However, it is important to indicate which unit or subunit test covers the lesson content and what additional means, other than formal tests (e.g., classroom performances, projects, and portfolios), you will use to grade students' responses. The information from this assessment will provide important feedback about your students' readiness for new content and possible reasons for poor performance in later lessons for which the current material is prerequisite.

Example Lesson Plan

Literature and U.S. History

Unit Title: Gold Rush (Laterally Planned Unit)

Lesson Title: Westward Journals

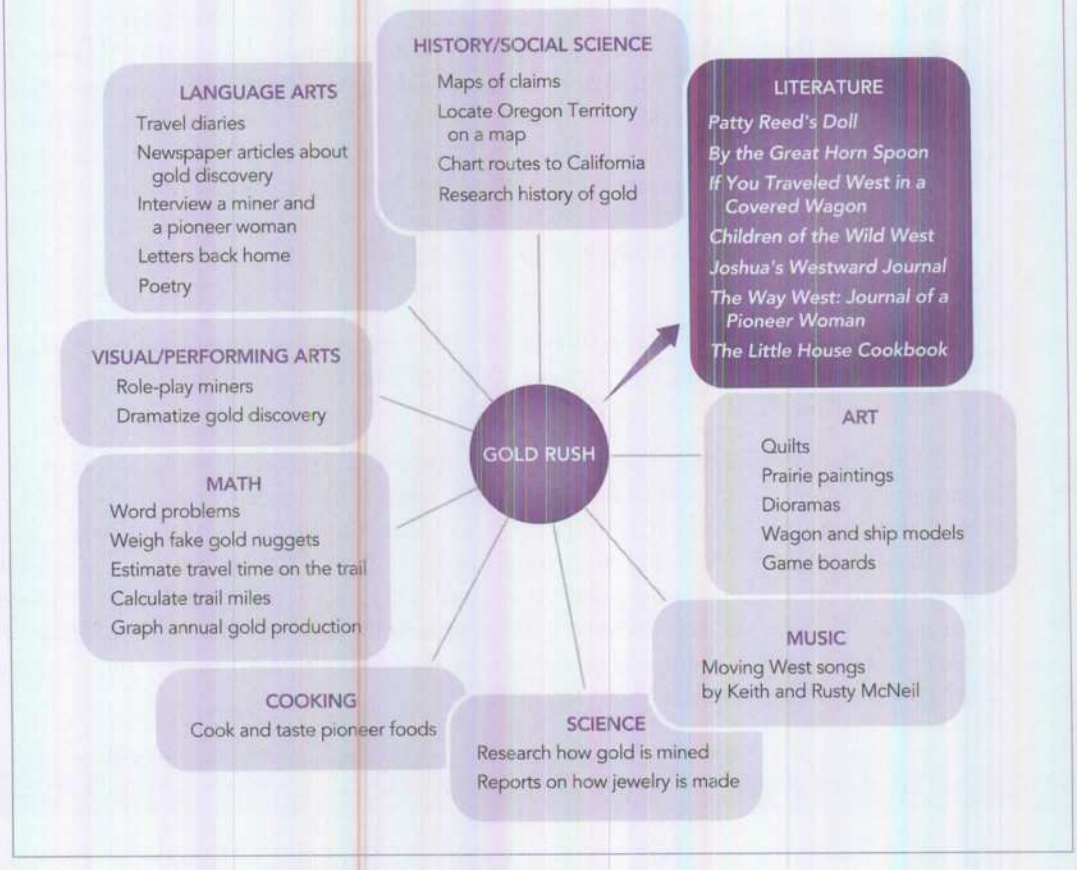
Subject Areas: History/Social Science, Language Arts, Art

The preceding titles indicate the general content of the lesson and the unit of which it is a part. This lesson appears on an interdisciplinary unit plan as a lesson in reading or literature titled "Westward Journals," as shown in Figure 4.13.

1 **Gaining attention.** Display items or pictures of items that pioneers may have brought with them on their trip West. These will include a diary, a bonnet, old tools, the Bible, and a cast-iron skillet.

2 **Informing the learner of the objective.** Students will be expected to choose one of the routes to California and write a diary entry from the 1840s detailing a day on the trip. Students may be creative in their presentation of this product,

Figure 4.13 Visual Representation of the Interdisciplinary Unit Theme "Gold Rush," Which Includes the Lesson "Westward Journals"



Source: Developed by Cynthia Kiel, teacher, Glendora, California.

choosing to design a diary or journal or perhaps writing their entry on a ship or wagon made of construction paper.

3 **Stimulating recall of prerequisite learning.** As a class, students will brainstorm the main events learned about the trip West and record them on a large chart.

4 **Presenting the content.** Have students read excerpts from *The Way West: Journal of a Pioneer Woman,* by Amelia Stewart Knight, and *Joshua's Westward Journal,* by Joan Anderson. Lead a discussion of how each author details and summarizes events on the journey.

5 **Eliciting the desired behavior.** Have students pretend they are children in a wagon train or aboard a ship on the trip West in the 1840s. Tell them to write journal or diary entries about their experiences. Provide a variety of writing paper and construction paper, and invite students to be creative in designing their journals.

6 **Providing feedback.** While the students are writing, ask individuals to share excerpts from their entries. Point out how the students are including the items listed on the brainstorming chart made at the beginning of the lesson.

7 **Assessing the lesson outcome.** Design a rubric describing various degrees of proficiency to grade the journal entries. Criteria may include adherence to factual events in 1840, use of descriptive language, and creativity.

Source: Written by Cynthia Kiel, teacher, Glendora, California.

Table 4.4 presents the approximate amount of time during a 50-minute class period that you might devote to each instructional event. Some periods will differ considerably from these amounts of time, such as when the entire lesson is devoted to a review or when recall of prior learning and assessing behavior is not relevant to the day's lesson. Keep in mind that experience, familiarity with content, and common sense always are your best guides for determining the percentage of time to devote to each instructional event.

From Table 4.4, it is apparent that when you emphasize one instructional event, you must deemphasize another; trade-offs always occur. Although every teacher would like to have more (sometimes less) time than allotted for an instructional period, he or she must decide how to fit a lesson into the available time. Table 4.4 indicates some of the ways this might be done when planning a typical lesson.

The following lesson plans illustrate the seven instructional events in other content areas and grade levels.

Table 4.4 Approximate Distribution of Instructional Time across Instructional Events for a Hypothetical 50-Minute Lesson

Instructional Event	Ranges in Minutes	Ranges in Percentages of Time
Gaining attention	1–5	2–10
Informing learners of the objective	1–3	2–6
Stimulating recall of prerequisite learning	5–10	10–20
Presenting the content	10–20	20–40
Eliciting the desired behavior	10–20	20–40
Providing feedback	5–10	10–20
Assessing behavior	0–10	0–20

Example Lesson Plan

United States History

Unit Title: United States History (Early Beginning through Reconstruction)

Lesson Title: Causes of the Civil War—Lesson 2.3

1 **Gaining attention.** Show the following list of wars on a transparency:

French and Indian War, 1754–1769
Revolutionary War, 1775–1781
Civil War, 1861–1865
World War I, 1914–1918
World War II, 1941–1945
Korean War, 1950–1953
Vietnam War, 1965–1975

2 **Informing the learner of the objective.** Learners will be expected to know the causes of the Civil War and to show that those causes also apply to at least one of the other wars listed on the transparency.

3 **Stimulating recall of prerequisite learning.** Briefly review the causes of both the French and Indian War and the Revolutionary War, as covered in lessons 2.1 and 2.2.

4 **Presenting the content.** (a) Summarize the major events leading to the Civil War: rise of sectionalism, labor-intensive economy, and lack of diversification. (b) Identify significant individuals during the Civil War and their roles: Lincoln, Lee, Davis, and Grant. (c) Describe four general causes of war, and explain which are most relevant to the Civil War: economic (to profit), political (to control), social (to influence), and military (to protect).

5 **Eliciting the desired behavior.** Ask the class to identify which of the four causes is most relevant to the major events leading up to the Civil War.

6 **Providing feedback.** Ask for student answers and indicate the plausibility of the volunteered responses.

7 **Assessing the lesson outcome.** Assign as homework a one-page essay that assesses the relative importance of the four causes for one of the wars listed on the transparency.

Example Lesson Plan

Language Arts

Unit Title: Writing Concepts and Skills

Lesson Title: Descriptive, Narrative, and Expository Paragraphs—Lesson 1.3

1 **Gaining attention.** Read to students examples of short descriptive, narrative, and expository paragraphs from Sunday's newspaper.

2 **Informing the learner of the objective.** Students will be able to discriminate among descriptive, narrative, and expository paragraphs from a list of written examples in the popular press.

3 **Stimulating recall of prerequisite learning.** Review the meanings of the words *description, narration,* and *exposition* as they are used in everyday language.

4 **Presenting the content.** Using a headline from Sunday's newspaper, give students examples of how the story could be reported using description, narration, and exposition.

5 **Eliciting the desired behavior.** Take another front-page story from Sunday's newspaper and ask each student to write a paragraph relating the story in descriptive, narrative, or expository form, whichever he or she prefers.

6 **Providing feedback.** Call on individuals to read their paragraphs aloud; check each paragraph against the criteria for the type the student intended to write.

7 **Assessing the lesson outcome.** Provide multiple-choice questions about each form of writing on the unit test. Have students revise their paragraphs as needed and turn them in as homework the following day.

Example Lesson Plan

Mathematics

Unit Title: Consumer Mathematics

Lesson Title: Operations and Properties of Ratio, Proportion, and Percentage—Lesson 3.3

1 **Gaining attention.** Display the following so all students can see: (a) can of diet soft drink, (b) 1-pound package of spaghetti, (c) box of breakfast cereal.

2 **Informing the learner of the objective.** Learners will be expected to know how to determine ratios, proportions, and percentages from the information on labels of popular food products.

3 **Stimulating recall of prerequisite learning.** Review the definitions of *ratio, proportion,* and *percentage* from the math workbook.

4 **Presenting the content.** Write the information from the soft drink label on a transparency and ask students to identify the percentage of sodium.

5 **Eliciting the desired behavior.** Write on the board the list of ingredients given on the cereal box; ask students to determine (1) the percentage of daily allowance of protein, (2) the proportion of daily allowance of vitamin A, and (3) the ratio of protein to carbohydrates.

6 **Providing feedback.** Using the information on the board, point to the correct answer for behaviors 1 and 2, and show how to find the appropriate numerator and denominator for behavior 3 (in step 5) from the ingredients on the label.

7 **Assessing the lesson outcome.** Provide on the weekly quiz five problems that cover ratios (two problems), proportions (two problems), and percentages (one problem) using labels from other consumer products.

Example Lesson Plan

Science

Unit Title: Manipulative Laboratory Skills

Lesson Title: Use of the Microscope—Lesson 1.1

1 **Gaining attention.** Show the first 5 minutes of a video about making a lens.

2 **Informing the learner of the objective.** Learners will be expected to be able to focus correctly on a specimen of one-celled animal life, using both high and low magnification.

3 **Stimulating recall of prerequisite learning.** Review the procedures for selecting a slide from the one-celled specimen collection and mounting it on the specimen tray of the microscope.

4 **Presenting the content.** While a student demonstrates in front of the class, help position his or her posture and hands on the microscope. Gently bend his or her body and hands until the correct positioning results. Also, demonstrate the position of the eyes, and show the clockwise and counterclockwise rotation of low and then high magnification adjustment.

5 **Eliciting the desired behavior.** Have each student obtain a specimen slide, mount it on a microscope, and focus on low magnification. Randomly check microscopes, correcting the slide, position, and focus as needed with the student observing. Repeat this step for high magnification.

6 **Providing feedback.** Provide feedback in the context of the eliciting activity (step 5) to increase the immediacy of the feedback. Also refer students to the text for examples of focused and unfocused specimens.

7 **Assessing the lesson outcome.** At the completion of the unit, assess students during a practical lab exam that requires the correct mounting and identification of three unknown specimens using the microscope.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 4 content. After reading the case history, go to Chapter 4 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

A Latin student, Sean, is wearing a toga that shows his bare calves and sandaled feet. Short strips of leather dangle from his hand as he trots about Mr. Cody's tenth-grade

English classroom, where he has been invited to show how the Romans dressed and acted for the Feast of the Lupercal. Sean playfully laughs and slaps his classmates on the back, as though at a party.

"That's what the Feast of the Lupercal was all about," he says. "The young Roman men ran races carrying strips of goat hide, which they considered symbols of fertility. The race course was lined with women who wished to have children; they stood alongside the road, hoping to be touched by the leather."

A few students ask Sean for more information about the feast, and he tells them about some of the athletic games and competitions not mentioned in their current unit about Shakespeare's *Julius Caesar.* It is time for Sean to return to his Latin class, so Mr. Cody fields some of the remaining questions.

"So Caesar wanted his wife to stand in Antony's way so she could have a baby?" Lupe asks.

Instead of answering, Mr. Cody asks another question. "If that were true, Lupe, why would it be significant? What might that tell us about Caesar's ambitions?"

"That he wanted a family. Being emperor wasn't enough to make him happy." Tiffany looks up from the *Glamour* magazine inserted between the pages of her text.

"No," Lupe smiles. "It means he wanted an heir. That he wasn't content to be emperor just for life. He wanted to start his own—what do you call it—dynasty, I think."

"Exactly right, Lupe. Now you can see why some of those senators had a right to be worried." Mr. Cody adjusts his reading glasses and opens his book. "Now let's get back to that section we talked about yesterday, the part about the 'falling sickness.' " He pauses while students open their books to the designated page.

"Angelique, just what is the falling sickness?" Mr. Cody waits for a reply and then reminds her to look at the footnote.

After a few flustered attempts at pronunciation, Angelique responds, "Epilepsy."

"We were talking about that yesterday, about how the senators made such a mockery of Caesar's physical weaknesses behind his back, and some of you felt that was very mean spirited of them. Those of you taking a history class volunteered to bring up this issue with your teachers, and I suggested that the rest of you might ask an older relative about it."

"My grandpa says that Franklin Roosevelt had polio but that he never appeared in public in his wheelchair," states Danielle.

Nathan volunteers, "Well, it's not really being mean, Mr. Cody. I mean, our president is the commander in chief. He has to be ready to lead us into war; he has to be healthy." Tim looks up from his text.

"He doesn't have to lead the troops himself, though. I mean, wheelchair or not, FDR led us to victory in World War II." Wanda has the last word, as Mr. Cody puts up his hand to quell further discussion.

He continues, "Let's take the next 20 minutes to put our thoughts into words. To what extent do we, like the Romans of Julius Caesar's time, expect our leaders to be physically vigorous? What is your personal opinion on the subject? Support it with reasons."

SUMMING UP

The main points in this chapter include the following:

Teacher as Decision Maker

1. Four primary inputs to the planning process are (a) knowledge of instructional goals, (b) knowledge of learner needs, (c) knowledge of subject-matter content, and (d) knowledge of teaching methods.
2. Four sources from which you can obtain information about the four inputs to planning are (a) practical experiences, such as observing in classrooms;

(b) reading case studies about what more and less successful teachers have done; (c) reading the professional literature about important ideas, conceptual systems, and paradigms for thinking about teaching; and (d) reading empirical studies about what the research says about your subject and how to teach it.

3. Another input to the planning process is tacit knowledge, representing what works, as discovered over time and through experience.

Unit and Lesson Plans

4. A unit of instruction may be thought of as a system; individual lessons within the unit are its component parts.
5. The concept of *hierarchy* tells us the relationship of the parts to the whole (in this case, lessons to units), and the concept of *task-relevant prior knowledge* tells us what must come before what in a sequence of events (lesson sequence).

Disciplinary and Interdisciplinary Unit Planning

6. Units can be planned vertically, emphasizing the hierarchy of the lesson content and task-relevant prior knowledge within a discipline, or laterally, emphasizing themes that integrate bodies of knowledge across disciplines to convey relationships and patterns that bind different aspects of our world.
7. In vertical planning, boxes illustrate areas of content, or instructional objectives, at various levels of generality. Lines and arrows indicate sequences among lessons and how outcomes of lessons build on one another to achieve a unit goal.
8. Three activities of vertical unit planning include the following:
   - Classifying unit outcomes at a higher level than lesson outcomes in the taxonomies of behavior
   - Planning the instructional sequence so the outcomes of previously taught lessons are instrumental in achieving the outcomes of subsequent lessons
   - Rearranging or adding lesson content to provide task-relevant prior knowledge where needed
9. In lateral, or interdisciplinary, planning, a central theme is identified, and lines or arrows are connected to it to indicate major ideas for lesson content; subordinate ideas flow outward from them.
10. Three activities of lateral, or disciplinary, planning are as follows:
    - Identifying an interdisciplinary theme
    - Integrating bodies of knowledge across multiple disciplines
    - Identifying relationships and patterns that bind different aspects of our world

Making Lesson Plans

11. Before starting the preparation of a lesson plan, you should identify the learning outcome desired for the lesson (e.g., knowledge, application, evaluation, etc.) and what provisions for student diversity need to be included (e.g., time-limited ability grouping, peer tutoring, learning centers, specialized handouts, cooperative grouping).

Events of Instruction

12. The term *learning* refers to internal events in the heads of learners that result from external teaching events you provide. Hence, the words *teaching* and *learning* refer to two different but related sets of activities.
13. The following external events should be specified in a lesson plan:
    - Gaining attention
    - Informing the learner of the objective
    - Stimulating recall of prerequisite learning
    - Presenting the content
    - Eliciting the desired behavior
    - Providing feedback
    - Assessing the lesson outcome
14. Gaining attention involves getting your students interested in what you will present and getting them to switch to the appropriate modality for the upcoming lesson.
15. Informing learners of the objective involves telling them the learning outcome expected at the end of the lesson.
16. Stimulating recall of prerequisite learning is reviewing task-relevant prior information required by the lesson.
17. Presenting the content is delivering the desired content using procedures that stimulate thought processing and maintain interest.
18. Eliciting the desired behavior encourages the learner to attempt a response that displays the desired learning outcome.
19. Providing feedback tells the learner the accuracy of her or his elicited response in a nonthreatening, nonevaluative atmosphere.
20. Assessing the lesson outcome evaluates the learner's performance with tests, homework, and extended assignments.

KEY TERMS

Cross-age tutoring, 132
Curriculum guides, 115
Integrated thematic teaching, 124
Interactive individualized practice activities, 132
Interdisciplinary unit, 123
Lateral unit planning, 118
Living curriculum, 134
Peer tutoring, 132
Reflective practice, 113
System perspective, 113
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Thematic units, 124
Tutorial and communication technologies, 131
Vertical unit planning, 118

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. Identify the five inputs to the planning process from which the preparation of a lesson plan proceeds. When would you consult each input in the design of a lesson or unit plan?
*2. How can a unit outcome be more than the sum of its individual lesson outcomes? Give an example using content for a specific unit in your subject-matter area.
*3. Explain in your own words how the concepts of *hierarchy* and *task-relevant prior knowledge* are used in unit planning.
*4. Name the levels of behavior in each of the three domains (cognitive, affective, and psychomotor) that generally are most suitable for a unit outcome.
*5. How are the boxes further down on a vertical unit plan different from the boxes higher up? Use the example you provided in question 2 to illustrate your answer.
*6. Explain how a graphic unit plan for a vertical unit is different from a graphic unit plan for a lateral unit. In your own words, why must there be a difference?
7. In your own words, what is the distinction between *teaching* and *learning?* What examples might you use to illustrate the difference with respect to a learner in your classroom?
*8. Identify the instructional event for which the key behavior of *instructional variety* would be most important.
*9. Identify the instructional event for which the key behavior of *student success* would be most important.
*10. Identify the instructional event for which the key behavior of *student engagement in the learning process* would be most important.
*11. Indicate how the instructional events of providing feedback and assessing behavior differ according to (a) the evaluative nature of the feedback provided and (b) the immediacy with which the feedback is given.

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B.

1. From a lesson you have observed, provide an example of task-relevant prior learning that would need to be taught prior to your observation. From your observation of student behavior, do you believe this knowledge was adequately taught? Why or why not?

2. For subject matter you will be expected to teach, vertically plan a three-lesson unit within a discipline in which the sequence of lessons is critical to achieving the outcome. Then laterally plan a three-lesson interdisciplinary unit in which lesson sequence is unimportant. Be sure the lesson outcomes for each unit reflect the unit outcome. In both cases, follow the graphic format shown in this chapter using either the standard MS Word or Inspiration software (www.inspiration.com/home.cfm).
*3. From your classroom observations, identify several ways instruction was differentiated to meet individual learner needs in the context of a lesson. Which way do you believe will be most effective for your grade level or content area?
*4. From a lesson plan of a teacher you are observing, identify the seven events of instruction presented in this chapter. Which event or events, if any, could you not identify? Why?

Digital Portfolio Activity

The following digital portfolio activity relates to INTASC principles 4, 7, and 9.

Place your unit and lesson plans for Field Experience Activities 2 and 4 into your digital portfolio in a folder titled "Lesson and Unit Plans." These will provide examples of your skill at planning disciplinary and interdisciplinary units and lessons. Add other examples of lesson and unit plans that represent your best planning as they become available.

Classroom Observation Activity

The following classroom observation activity relates to INTASC principles 7 and 9.

The teacher's interpretation of the curriculum guide will depend on the unique characteristics of the students, their learning needs, the time that can be devoted to a specific topic, and the overall knowledge, skills, and understandings learners are expected to acquire at the end of a unit. However, a close relationship among goals at the national level (as expressed by professional associations and councils), standards at the state and school district levels (as expressed by curriculum guides), and objectives at the classroom level (as identified by the teacher and curriculum) is necessary for maintaining a teacher's task orientation, which provides for the most efficient use of instructional time possible for student learning.

For this activity, go to Chapter 4 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 4.1, titled Format for Studying the Relationship between Unit/Lesson Plans and Curriculum Guide/Text. Identify a lesson you would like to teach. In the first part of the instrument, indicate the chapter and/or workbook subheadings and pages pertaining to your lesson objective(s), and check off the instructional activities you will use to teach this lesson. Then comment on the degree to which your lesson objective(s) correspond with your lesson activities and to the text or workbook. Place this completed form in your digital portfolio folder labeled "Lesson and Unit Planning" as further evidence of your lesson- and unit-planning skills.

5

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. What can I do during the first weeks of school to build a classroom climate of trust and cohesiveness?
2. What can I teach my learners to help them discuss and resolve group conflicts on their own?
3. How do I get my class to develop group norms?
4. What types of classroom rules will I need?
5. How might I use the organization of my classroom to bridge cultural gaps and reach learners with special needs?

INTASC

principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.

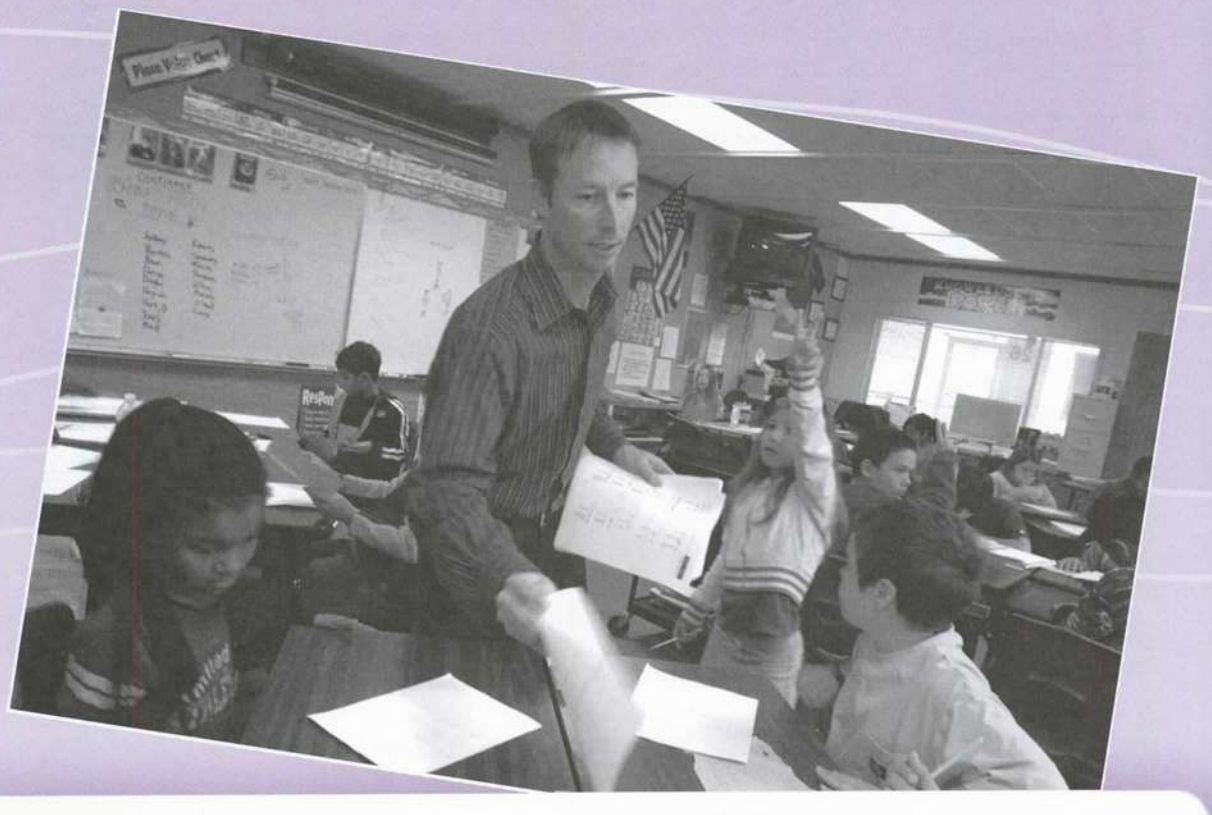
principle 5 The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.

principle 9 The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

principle 10 The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well-being.

Classroom Management I

Establishing the Learning Climate



For most teachers, confronting some sort of classroom management problem is a daily occurrence. These problems may include simple infractions of school or classroom rules, or they may involve more serious events, including showing disrespect, cheating, using obscene words and gestures, and openly displaying hostility.

The management of your classroom must begin with developing trusting relationships with your students. Without mutual feelings of trust and respect, you will be unable to assume the role of an instructional leader in your classroom. To accomplish this, this chapter discusses how you can do these things:

1. *Design an orderly workplace that promotes your academic goals*
2. *Develop rules for the workplace that create group norms that students respect and follow*
3. *Change in response to unproductive rules, routines, and procedures*
4. *Maintain a workplace that fosters feelings of belonging and group solidarity*
5. *Know how to seek help from other school professionals and parents*

EARNING TRUST AND BECOMING A LEADER THE OLD-FASHIONED WAY

To check your comprehension on the content covered in Chapter 5, go to the Book Specific Resources in the MyEducationLab for your course, select your text, and complete the Study Plan. Here you will be able to take a chapter quiz, receive feedback on your answers, and then access review, practice, and enrichment activities to enhance your understanding of chapter content.

According to social psychologists (French & Raven, 1959; Raven, 1974; Schmuck & Schmuck, 2001), to establish yourself as an effective leader, you have to gain your students' trust and respect the old-fashioned way: You have to earn it. But how?

French and Raven (1959) provide a way of looking at how you earn respect by asking how you achieve social power. They identify five types of **social power,** or leadership, a teacher can strive for: expert power, referent power, legitimate power, reward power, and coercive power.

Expert Power

Certain individuals become leaders because others perceive them as experts. Successful teachers have **expert power.** Their students see them as competent to explain or do certain things and as knowledgeable about particular topics. Such influence is earned, rather than conferred by virtue of having a particular title. Teachers with expert power explain things well, show enthusiasm and excitement about what they teach, and appear confident and self-assured before their classes.

New teachers often find it difficult to establish leadership through expert power. Even though they are knowledgeable and competent in their field, uncertainty and inexperience in front of a group may make them appear less so. Students are attuned to body language that suggests lack of confidence and indecision and may test the competence and challenge the authority of teachers who appear not to be in command of their subject.

Referent Power

Students often accept as leaders teachers they like and respect. They view such teachers as trustworthy, fair, and concerned about them (Glasser, 1998b; Goodlad, 2004). The term **referent power** describes leadership earned in this way. Ask any group of junior or senior high school students why they like particular teachers, and invariably they describe the teachers they like as "fair," "caring," and "someone you can talk to." Without referent power, even teachers with expert power may have their authority challenged or ignored.

Teachers often say they would rather be respected than liked, as if these two consequences were mutually exclusive. Research by Soar and Soar (1983) and Letts (1999) suggests that teachers can be both respected and liked. In fact, teachers who are both respected and liked are associated with greater student satisfaction and higher achievement. Glasser (1998a) emphasizes that students' need for belonging in a classroom will more likely be met by a teacher who is perceived as both warm and competent.

Legitimate Power

Some roles carry with them influence and authority by their very nature. Police officers, presidents, and judges exert social power and leadership by their very titles. Influence in such cases may be conferred by the role itself, rather than depend on the nature of the person assuming the role. Savage (1999) refers to this type of power as **legitimate power,** and unlike expert and referent power, it may not be earned. Teachers possess a certain degree of legitimate power. Our society expects students to give teachers their attention, respect them, and follow their requests. Most families also stress the importance of listening to the teacher. Every new teacher begins her or his first day of class with legitimate power.

Legitimate power therefore gives the new teacher some breathing room during the first few weeks of school. Most students will initially obey and accept the authority of new teachers by virtue of their position of authority. However, building classroom leadership solely through legitimate power may be like building a house on a foundation of sand. Teachers should use their legitimate power to establish referent and expert power.

Reward Power

Individuals in positions of authority are able to exercise **reward power** in relation to the people they lead. Someone with this power can give out rewards in the form of privileges, approval, or more tangible compensation, such as money. To the extent that students desire the rewards conferred by teachers, teachers can exert a degree of leadership and authority (Gootman, 2008).

There are, however, few rewards available to teachers and a great number of rewards available to students without the aid of a teacher. Students who do not care much about good grades or teacher approval are difficult to lead solely by exerting reward power, because they can attain much of what is reinforcing to them outside school. In such cases, some teachers resort to using tangible reinforcers, such as access to desired activities, prizes, and even food. In this chapter, you will learn that reward power can be an effective tool in the classroom but cannot substitute for referent and expert power.

Coercive Power

Through state and local government, teachers are allowed to act *in loco parentis*—that is, in place of the parent. Consequently, within limits, schools can punish students who defy the authority or leadership of the teacher using such techniques as suspension or expulsion, denial of privileges, or removal from the classroom. Teachers who rely on such techniques to maintain social power in their classroom are using **coercive power.** The use of coercive power may stop misbehavior for a time, but this will sometimes be at the cost of developing trust and meeting student needs. Overreliance on coercive power involves the danger of increasing attitudes that may lead to antagonism and disengagement from the learning process.

Although each of the preceding sources of power, when properly used, is a legitimate tool for managing the classroom, teachers—especially new teachers—should work quickly to achieve expert and referent power. You can achieve expert power by keeping up to date with developments in your teaching field, completing in-service and graduate programs, attending seminars and workshops, and completing career ladder and mentoring activities provided by your school district. From your very first day in the classroom, you can exhibit referent power by instilling in your students a sense of belonging and acceptance.

S

Social psychologists, such as Schmuck and Schmuck (2001) and Curtis and Carter (2007), believe the sources of social power you acquire are important for guiding your learners through the process of group development. They believe every successful group passes through a series of **stages of group development,** during which it has certain tasks to accomplish and concerns to resolve. The way the group accomplishes these tasks and resolves these concerns determines the extent to which you can effectively and efficiently manage the group and accomplish the goals of your classroom. Maurer (1985) describes these stages:

- *Stage 1, Forming.* Resolving concerns about acceptance and responsibilities
- *Stage 2, Storming.* Resolving concerns about shared influence
- *Stage 3, Norming.* Resolving concerns about how work gets done
- *Stage 4, Performing.* Resolving concerns about freedom, control, and self-regulation

Stage 1: Forming

When learners come together at the start of the school year, they usually are concerned about two issues: (1) finding their place in the social structure and (2) finding out what they are expected to do. This raises concerns about *inclusion,* or group membership.

During the first several days of class, learners (and teachers) naturally ask questions like these: How will I fit in? Who will accept or reject me? What do I have to do to be respected? At this time, a phenomenon called *testing* takes place. Learners engage in specific actions to see what kind of reaction they get from teachers and peers. At this stage of group formation, learners are curious about one another. They want to know where other class members live, who their friends are, what they like to do, and where they like to go. As students learn more about one another, they begin to see how and with whom they fit in. Castaneda (2004) urges teachers to engage in activities during the first few weeks of school to help learners trust one another and feel like members of a group.

Social psychologists caution teachers of the tendency during the first stage of classroom group development to concentrate almost exclusively on concerns about work and rules to the exclusion of concerns about inclusion. They warn that learners who have unresolved fears about being accepted by their teacher and fitting into their peer group will find it difficult to concentrate on academic work. They must first develop trust and feel like valued members of a group (Schmuck & Schmuck, 2001).

Table 5.1 lists questions you can ask yourself to assess group development during the forming stage.

Stage 2: Storming

The goals of the forming stage of group development are to help learners feel secure and to perceive themselves as members of a classroom group. Healthy group life at this stage occurs if learners have accepted the teacher as their leader, made some initial commitment to follow rules and procedures, and agreed to respect other members of the class.

During the storming stage of group development, students begin to test the limits of these commitments. This limit testing may take the form of amiable challenges to academic expectations and rules in order to establish under what conditions they do and do not apply. Learners may question seating arrangements, homework responsibilities, seatwork routines, and so on. Social psychologists refer to these amiable challenges to teacher authority and leadership as examples of **distancing behavior.** They occur in any group where a leader initially establishes authority by virtue of his or her position, rather than through competence or credibility. This distancing behavior represents reservations learners have at this stage of group development about the commitments they made during the forming stage to class expectations and group participation.

A second type of amiable limit testing, which often accompanies distancing behavior, is called **centering behavior.** Centering occurs when learners question how they will personally benefit from being a group member. Their behavior can be described with the question, What's in it for me? The questions learners ask and the assertions they make reflect a preoccupation with fairness. They are quick to notice favoritism toward individual members of the group.

The distancing and centering conflicts that arise between teachers and learners, as well as among learners, are a natural part of group development. Social psychologists caution teachers about overreacting at this stage. During these types of conflicts, you will

need to monitor compliance with rules and procedures but be willing to reconsider those that may not be working.

Buehl (2008), Glasser (1998b), and Kreidler (2005) urge teachers to have class discussions based on group conflict resolution. They recommend that teachers instruct their learners in how to problem solve using the following process:

1. *Agree there is a problem.* The teacher gets all members of the class to agree that there is a problem and that they will work together to solve it.
2. *State the conflict.* The teacher states concisely what the conflict is and assures all learners that they will have the opportunity to state their perspective.
3. *Identify and select responses.* Teachers and learners brainstorm and record solutions to the problem. They assess the short- and long-term consequences of the solutions, and discard those that have negative consequences.
4. *Create a solution.* The class discusses and records a solution that everyone basically agrees will resolve the conflict.
5. *Design and implement a plan.* The class discusses and works out the details of when, where, and how to resolve the conflict.
6. *Assess the success of the plan.* The students identify information they can gather to determine the success of the plan. The teacher identifies checkpoints to evaluate how the class is doing. When the conflict is resolved, the whole class discusses the value of the problem-solving process.

Table 5.1 lists questions you can ask yourself to assess group development during the storming stage.

Table 5.1 Important Questions about Group Development

Stage 1: Forming	Stage 2: Storming	Stage 3: Norming	Stage 4: Performing
1. Are there activities for everyone to get to know about one another?	1. Are conflicts openly recognized and discussed?	1. Is there a process for resolving conflict?	1. Can the group evaluate its own effectiveness?
2. Has everyone had a chance to be heard?	2. Can the group assess its own functioning?	2. Can the group set goals?	2. Can the group and individuals solve their own problems?
3. Do learners interact with a variety of classmates?	3. Are new and different ideas listened to and evaluated?	3. Can learners express what is expected of them?	3. Does the group have opportunities to work independently and express themselves through a medium of their own choosing?
4. Do learners and teachers listen to one another?	4. Are the skills of all members being used?	4. Is there mutual respect between teacher and learners?	4. Can individuals evaluate themselves and set goals for personal improvement?
5. Have concerns and/or fears regarding academic and behavioral expectations been addressed?	5. Do all learners have an opportunity to share leadership and responsibility?	5. What happens to learners who fail to respect norms?	5. Is the group prepared to disband?

Source: From Richard A. Schmuck and Patricia A. Schmuck, *Group Processes in the Classroom*, 6th edition. Copyright © 2001, 1992 Wm. C. Brown Communications, Inc., Dubuque, Iowa. Reproduced with permission of The McGraw-Hill Companies.

Stage 3: Norming

The security learners develop at the forming stage provides them with a safe foundation to challenge teacher authority during the storming stage. Skilled leadership during the storming stage assures learners that they will be listened to, treated fairly, and allowed to share power and influence. This assurance leads them during the norming stage to accept academic expectations, procedures, and rules for the group and the roles and functions of the various group members.

Norms are shared expectations among group members regarding how they should think, feel, and behave. Social psychologists view norms as the principal regulators of group behavior (Di Giullio, 2006; Schmuck & Schmuck, 2001; Zimbardo, 1992). Norms may take the form of either written or unwritten rules that all or most of the group voluntarily agree to follow. A classroom group has norms when learners, for the most part, agree on what is and is not socially acceptable classroom behavior.

Norms play an important role in governing behavior in the classroom, but their role differs from that of rules and procedures. Norms are more personally meaningful than rules, as seen in the following examples of classroom norms:

It's OK to be seen talking to the teacher.
Learners in this class should help one another.
We're all responsible for our own learning.
We shouldn't gloat when one of our classmates gives the wrong answer.
We need to respect the privacy of others.
The most important thing for this class is learning.

Social psychologists believe that positive norms serve several important functions in the classroom (Gerrig & Zimbardo, 2007; Putnam, 2006; Schmuck & Schmuck, 2001):

- Norms orient group members to which social interactions are and are not appropriate and then regulate these interactions. When norms are present, learners can anticipate how others will behave in the classroom and also how they are expected to behave.
- Norms create group identification and group cohesiveness (Gerrig & Zimbardo, 2007; Zimbardo, 1992). Social psychologists believe the process of group formation begins when its members agree to adhere to the norms of the group. This process begins during the forming stage of group development and ends during the norming stage.
- Norms promote academic achievement and positive relationships among class members. Academic and social goals are more likely to be achieved in classrooms with consistent norms. For example, peer-group norms represent one of the most important influences on school performance (Schmuck & Schmuck, 2001).

Group norms, whether in support of a teacher's goals or opposed to them, begin to develop on the first day of school during the forming stage of group development. Social psychologists have identified two basic processes by which norms develop: diffusion and crystallization. **Diffusion** takes place as learners first enter a group or class. They bring with them expectations acquired from experiences in other classes, from other group memberships, and from experiences growing up. As learners talk and mingle with each other during breaks and recess, they communicate with one another. Their various expectations for academic and social behavior are diffused and spread throughout the entire class. Eventually, as learners engage in a variety of activities together, their expectations begin to converge and form a shared perspective of classroom life. This is the process of **crystallization.**

You should do all you can to influence the development of norms that support your classroom goals. It is important that you know how to positively influence the development of class norms and to identify and alter existing ones. Here are some suggestions for developing, identifying, and altering group norms:

- Explain to the class the concept of a *group norm*. Draw up a list of norms with the class, and over time, add and delete norms that either help or impede the work of the group.
- Conduct discussions of class norms, and encourage learners to talk among themselves about norms. Glasser (1998b) suggests discussing with students ideas on how the class might be run, problems that may interfere with the group's performance, and needed rules and routines.
- Appoint or elect a class council to make recommendations for improving the class climate and productivity. Have the group assess whether the norms are working.
- Provide a model of the respect, consistency, and responsibility for learning that you want your learners to exhibit.

Healthy group development at the norming stage is characterized by group behavior that is primarily focused on academic achievement.

Stage 4: Performing

By the time the group has reached the fourth developmental stage, learners feel at ease with one another, know the rules and their roles, accept group norms, and are familiar with the routine of the classroom. The principal concern for the group at this stage is establishing its independence.

Just as the storming stage of development was characterized by a testing of limits, the performing stage is characterized by learners wanting to show they can do some things independently of the teacher. Social psychologists urge teachers to encourage the desire for independence at this stage by focusing less on classroom control and more on teaching the group how to set priorities, budget time, and self-regulate.

The performing stage ends when the school year or semester ends. Thus this stage represents a time of transition. Assuming all four stages of development have been successfully completed, learners will have developed relationships with one another and with their teacher, through which they may manage themselves with the guidance and direction of the teacher. For this transition to occur successfully, however, you will need to establish a classroom climate in which group development can flourish through all four stages. See In Practice: Focus on a Democratic Approach to Classroom Management.

E[illegible] IN EFFECTIVE CLASSROOM CLIMATE

The *classroom climate* is the atmosphere or mood in which interactions between you and your students take place. Your classroom climate is created by the manner and degree to which you exercise authority, show warmth and support, encourage competitiveness or cooperation, and allow for independent judgment and choice. The climate of your classroom is of your choosing, just as your instructional methods are.

This section introduces two related aspects of an effective classroom climate: the **social environment,** meaning the interaction patterns you promote in the classroom, and the **organizational environment,** meaning your physical or visual arrangement of the classroom. Both are your choices, and you can alter them to create just the right climate.

The Social Environment

The social environment of your classroom can vary from *authoritarian,* in which you are the primary provider of information, opinions, and instruction, to *laissez-faire,* in which your students become the primary providers of information, opinions, and instruction. Between these extremes lies the middle ground, in which you and your students share

IN PRACTICE

FOCUS ON A DEMOCRATIC APPROACH TO CLASSROOM MANAGEMENT

Patterned after family meetings in her own home, teacher Donna Styles's format for class meetings enables her students to share their thoughts and solve classroom issues on their own. In Styles's model, students take turns acting as a discussion leader, while the teacher promotes a respectful atmosphere and participates as a group member. Encouraged by the students' positive response to her approach, Styles decided to share her expertise with other teachers.

A teacher for more than thirty years, Styles is a veteran educator who has taught students in kindergarten through seventh grade, in both regular and multiaged settings. She has worked as a regular classroom teacher, in English and French immersion classes, and as a thinking skills/enrichment resource teacher. She currently teaches grades five and six at Len Wood Elementary School in Armstrong, British Columbia (Canada). Styles's practical and effective approach to classroom management did not develop from her extensive teaching experience, however, but from her hands-on experience as a parent! She explains:

> My husband and I had successfully used family meetings in our own family for years. We saw the positive effects of including our children in family decision-making. We saw firsthand how much more responsible our kids acted on an everyday basis, how much more an integral part of our family unit they felt, and how elevated their self-esteem became when their views were heard and considered. I realized the possible application in the classroom setting.

In her view, family-style class meetings can play a critical role in the development of students' emotional, social, moral, and intellectual development. Styles suggests that class meetings also can promote personal growth, leadership, organizational and public-speaking skills, thinking skills and cognitive gains, problem-solving skills, and interpersonal skills—creating a community of learners.

An Idea Worth Sharing

"Class meetings are most successful in classrooms that have a warm, caring, supportive environment—classrooms in which students feel comfortable to learn, feel safe to share their ideas, and feel free to ask questions and take risks," explains Styles. "Students in those kinds of classrooms are supportive of one another, work together cooperatively, encourage one another, assume responsibility for their own learning and behavior, and are allowed to make decisions."

Styles outlines several key components that make class meetings unique and effective:

Students sit on chairs in a circle.

Meetings are held every week.

A set format is followed.

Students lead the meetings.

Both problems and suggestions are discussed.

Students encourage and compliment one another.

Styles maintains that incorporating class meetings is a reasonable task if teachers prepare students for meetings in about two to three lessons during the first weeks of school. She proposes that lessons involve the teaching and practice of encouragement, creative problem solving, and circle formation. After several trial meetings, with the teacher leading and modeling the process, students become meeting leaders, with each student taking a turn as discussion leader during the school year.

Conducting Class Meetings

"Class meetings help make good classrooms even better," says Styles. "The true power of meetings lies in their ability to empower students, to motivate them to learn, and to help them discover their personal best. When both students and teachers are able to voice opinions and thoughts in a quiet, respectful atmosphere, mutual respect and understanding develops. The students realize that it is *their* classroom as much as the teacher's, and they take ownership and pride in that."

In a typical class meeting desks are moved to the perimeter of the room and students take their designated places in a circle of chairs. The meeting leader opens the meeting. Old business is discussed and new business is dealt with. "Thank you's" and compliments are offered and the meeting is closed.

If a student wants an issue raised at a meeting, he or she places a slip of paper inside a box provided in the classroom. The papers, which include the name of

the student and the date, constitute the new business of the next meeting. Typically, three types of issues are put in the box: a problem involving one or more people, a problem or issue affecting the whole class, or a suggestion for a class activity.

During class meetings, the teacher

- Acts as a coach—providing guidance to the leader, when necessary.
- Fulfills the role of secretary.
- Performs as a group member—offering information only when needed, and making comments only when necessary to keep the tone positive and helpful.

The student leader

- Keeps the meeting running smoothly.
- Opens and closes the meeting.
- Follows the order of steps for conducting the meeting.
- Follows steps for solving problems.
- Follows steps for discussing suggestions.
- Makes eye contact with each person speaking.
- Participates like any other member.
- Keeps discussions on topic.
- Lets students know if they are out of order.
- Asks questions, clarifies, or restates problems or ideas.
- Summarizes.
- Speaks loudly and clearly.

Accountability Made Simple

Styles has found that, with classroom meetings, discipline becomes a minor issue. Problems are discussed in meetings and students themselves determine the consequences for misbehavior. Students become highly accountable for their actions in the classroom, she observes, when their peers are taking note of their behavior and discussing poor behavior in class meetings.

"When students choose solutions to problems, they have a stake in seeing that the consequences are followed," Styles states. "Problems in the classroom are no longer just the teacher's problems to solve—they become the class's problems. Practice with the process each week enables students to become excellent problem solvers, coming up with fair and effective methods of helping classmates improve and change behaviors that interfere with others or with their learning."

Suggestions put into the box give students an opportunity to work on committees and to plan and orchestrate many interesting and fun activities during the year. This generates excitement and energy in the classroom, helping students to "buy into" coming to school and to feel a sense of belonging to the group. "As a teacher, I think there is no other tool that has such a long list of benefits. Conducting weekly class meetings with this format easily makes it one of the most powerful tools a classroom teacher can use. And it's so simple." Styles reports that—without exception—students love class meetings, and that the approach is conducive to the inclusion of students with special needs.

Styles's book, *Class Meetings: Building Leadership, Problem-Solving and Decision-Making Skills in the Respectful Classroom,* is available from Pembroke Publishing.

Source: Article by Cara Bafile, EducationWorld.com (2002). Used with permission. For more about class meetings: www.sd83.bc.ca/classmtg/classindex.html. For more about what kids say about class meetings: www.sd83.bc.ca/classmtg/quotes.html.

responsibilities: Students are given freedom of choice and judgment under your direction. Many variations are possible.

For example, a group discussion might be a colossal failure in a rigid authoritarian climate, because the climate tells students that their opinions are less important than yours, that teacher talk and not student talk should take up most of the instructional time, and that the freedom to express oneself spontaneously is your right but not theirs. In a more open atmosphere, this same attempt at discussion might well be a smashing success, because the classroom climate provides all the ingredients of a good discussion—freedom to express one's opinion, a high degree of student talk, and spontaneity.

The social atmosphere you create—authoritarian, laissez-faire, or somewhere between—is determined by how you see yourself: Are you a commander in chief who carefully controls and hones student behavior by organizing and providing all the learning stimuli? Or are you a translator or summarizer of the ideas that students provide? Or

One aspect of an effective learning climate is the physical or visual arrangement of the classroom. This arrangement is a matter of choice that can be altered to create just the right climate for your learning objectives.

are you an equal partner with students in creating ideas and problem solutions? Consider the effects of each climate and how you can create it.

The effective teacher not only uses a variety of teaching strategies but also creates a variety of classroom climates. However, your ability to create a certain climate is as important as your ability to change the climate when the objectives and situation demand it. Although early research in social psychology tried to identify the type of climate most conducive to individual behavior (Lippitt & Gold, 1959), the results suggest that different climates have both advantages and disadvantages, depending on the intended goal.

Because goals change from lesson to lesson and week to week, so too must your classroom climate that supports the goals. When the goals change but your classroom climate does not, the stage is set for off-task, disruptive, and even antagonistic behavior among your students.

Competitive, Cooperative, or Individualistic. We have already examined several ways you can vary your authority, as well as that of your students, in accordance with your objectives. These variations correspond not only with how much you relinquish your authority and therefore your control of the learning process but also how competitive, cooperative, or individualistic you wish the interactions among members of your class to be. These three conditions are illustrated in Table 5.2. You can see in the table that as you shift the classroom climate from competitive to cooperative to individualistic, you relinquish control over the learning process until, in the individualistic mode, students have almost sole responsibility for judging their own work.

Applying the Three Climates. In addition to encouraging the proper climate for a given instructional activity, you must decide whether each climate can be applied to the

Table 5.2 Three Types of Classroom Climates

Social Climate	Example of Activity	Authority Vested in Students	Authority Vested in Teacher
Competitive: Students compete for the right answers among themselves or against a standard established by the teacher. The teacher is the sole judge of the appropriateness of a response.	Drill and practice	None	To organize the instruction, to present the stimulus material, and to evaluate the correctness of the responses
Cooperative: Students engage in dialogue that is monitored by the teacher. The teacher systematically intervenes in the discussion to sharpen and focus ideas and move the discussion to a higher level.	Small- and large-group discussion	To present opinions, to provide ideas, and to speak and discuss freely and spontaneously	To stimulate the discussion, to arbitrate differences, to organize, and to summarize student contributions
Individualistic: Students complete assignments monitored by the teacher. Students are encouraged to complete assignments with the answers they think are best. Emphasis is on getting through and testing oneself.	Independent seatwork	To complete the assignment with the best possible responses	To assign the work, and to see that orderly progress is made toward its completion

Table 5.3 Targets for Three Types of Classroom Climates

	Competitive	Cooperative	Individualistic
Full Class	Students compete with other students by having the correct answer when it's their turn.	Students are allowed to call out hints or clues when a student is having difficulty finding the right answer.	The entire class recites the answers in unison.
Groups	Subgroups compete as opposing teams.	Subgroups work on different but related aspects of a topic, combining their results into a final report to the class.	Each subgroup completes its own assigned topic, which is independent of the topics assigned to the other subgroups. No shared report is given to the class.
Individual	Individuals compete by having to respond to the same question. The student with the quickest and most accurate response wins.	Pairs of individuals cooperate by exchanging papers, sharing responses, or correcting each other's errors.	Individuals complete seatwork on their own without direct teacher involvement.

full class, to groups, and to individuals with equal effectiveness. For example, as shown in Table 5.3, it is not necessary to conduct all group discussions in a cooperative climate.

Although some of the climates described in Table 5.3 may be more prevalent than others, various arrangements of students and climates are possible, depending on your instructional goals. Your job is to ensure that the degree of authority you impose matches your instructional goal (for example, the expression of student opinion you allow, the amount of time you devote to student talk, and the spontaneity with which you want your students to respond).

The Organizational Environment

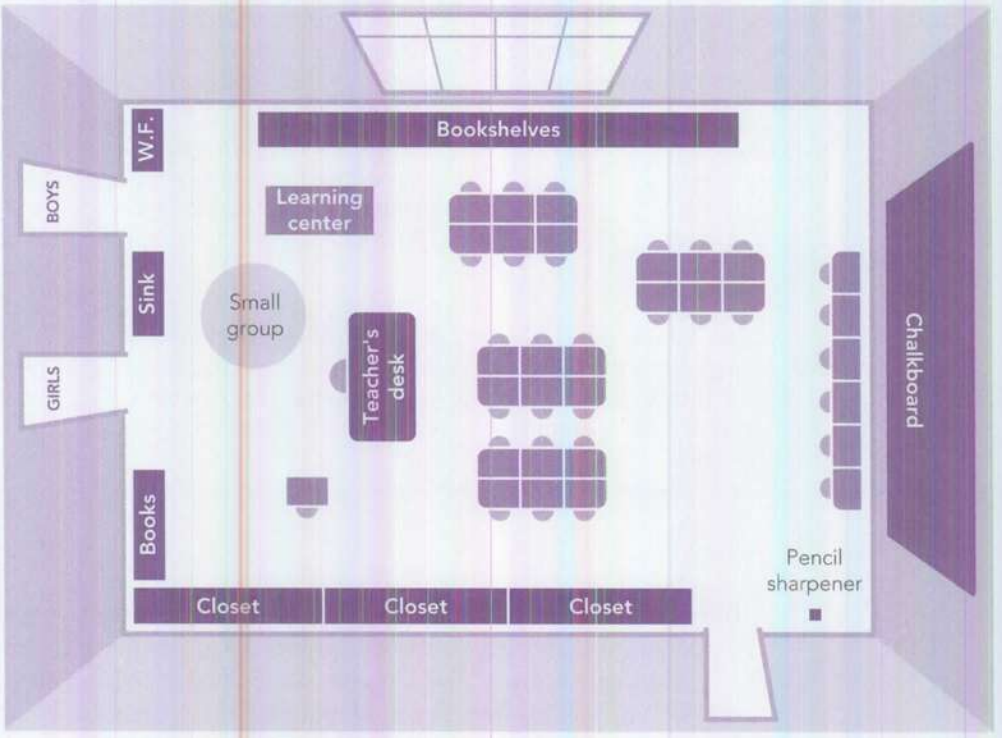
In addition to arranging the social climate of your classroom, you also must arrange the physical climate. It goes without saying that a classroom should be attractive, well lighted, comfortable, and colorful. But aside from creating a colorful bulletin board and being neat, you may have very little influence over the external features of your classroom. It is not unusual for teachers to bring essential items at the beginning of the year—such as an alarm clock, bookcase, file cabinet, rug, and pillows for younger learners—to establish the climate of their classroom.

What may be more important than these items, however, is the way the internal features of your classroom (desks, chairs, tables) are arranged. Students quickly get used to and accept the external features of a classroom, good or bad. But the internal arrangement of the classroom will affect your students every day of the school year.

In the upper grades, the most flexible furniture arrangement places your desk at the front of the room and aligns the student desks or tables toward you. Although it may seem strange to associate this traditional format with flexibility, it can be most flexible when you use it to create competitive, cooperative, and individualistic environments interchangeably. This, plus the difficulty of rearranging classroom furniture every time a change in social climate is desired, makes the traditional classroom arrangement in the upper grades almost as popular today as it was 50 years ago.

There are times, however, when you will want to change the arrangement to encourage a more cooperative, interactive, and group-sharing climate. Such a classroom arrangement has many variations, depending on the external features of the classroom and available furniture. One example is shown in Figure 5.1.

Figure 5.1 Classroom Arrangement Emphasizing Positive Relations and Learning to Cooperate



This change represents your deliberate attempt to get learners together. The barriers to interpersonal sharing and communication that sometimes result from the rigid alignment of desks can be avoided by a more informal but still systematic furniture arrangement. Because this arrangement communicates to learners that interpersonal communication and sharing are permitted, both will undoubtedly occur, whether you want them to or not.

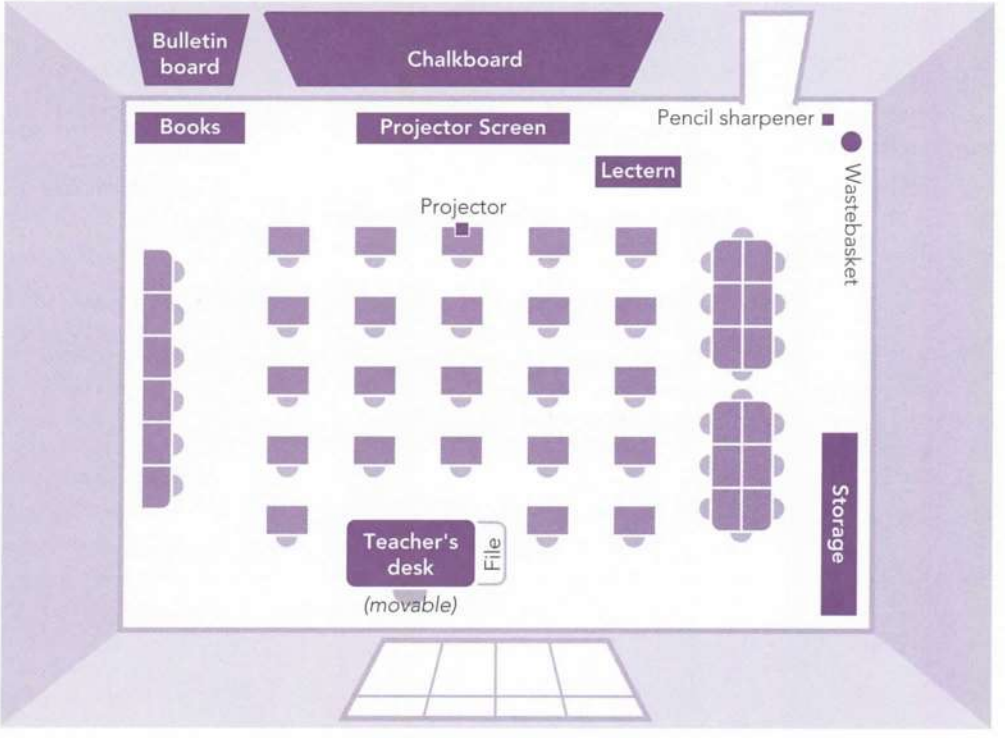
When you group four or five student desks or tables together, you expect more expression of student opinion, increased student talk, and greater spontaneity in student responses. This emphasizes the important notion that the social climate created by your words and deeds always should match the organizational climate created by the physical arrangement of your classroom.

Of course, changing the internal arrangement of a classroom from time to time for the sake of variety is refreshing. You might compromise by maintaining the basic nature of the formal classroom but, space permitting, setting aside one or two less formal areas (for example, a learning center, group discussion table or pillow, and reading center) for times when instructional goals call for independent work or interpersonal communication and sharing. In the early grades, these elements are almost always part of the classroom arrangement—and its climate. A version of this arrangement is shown in Figure 5.2.

Establishing Rules and Procedures

Establishing **rules and procedures** to prevent classroom discipline problems will be one of your most important classroom management activities (Emmer & Evertson, 2009; Evertson, 1995; Evertson & Emmer, 2009; Evertson & Harris, 1992). These rules and procedures, which you should formulate before the first day of school, are your commitment to applying the "ounce of prevention" and thus avoiding the "pound of cure."

Figure 5.2 Compromise Classroom Arrangement Allowing Independent, Group, and Cooperative Learning



To effectively manage a classroom, teachers need four basic types of rules and procedures:

- Rules related to academic work
- Rules related to classroom conduct
- Rules that must be communicated your first teaching day
- Rules that can be communicated later, at an appropriate opportunity

The top half of Figure 5.3 identifies some rules that may be needed during the very first days of school, either because students will ask about them or because events are likely to arise requiring their use. Notice that these rules are divided into seven conduct rules and seven work rules. For the elementary grades, it is best that you present them orally, *and* provide them on a handout, *and* post them for later reference by students. In the lower grades, learners can forget oral messages quickly—or choose to ignore them, if there is no physical representation of the rules as a constant reminder. In the later elementary grades and middle school, your recital of the rules while students copy them into their notebooks may be sufficient. For high school students, simply hearing the rules may be sufficient, as long as they are also posted for later reference.

Not all first-day rules are equally important, and other rules may have to be added as special circumstances require. But rules about responding and speaking out, making up work, determining grades, and violating rules are among the most important. It is in these areas that confusion often occurs, beginning on the very first day.

Figure 5.4 shows some of the issues you will want to consider pertaining to these four types of rules. Taking a few moments to think about these issues before they are raised in class can avoid an embarrassing pause and uncertain response when a student asks a question. Identify issues to be decided for the remaining rule areas in Figure 5.3. The bottom half of this figure identifies areas for which rules can be communicated as

Figure 5.3 Classroom Rules Related to Conduct and Work

	Rules related to classroom conduct	Rules related to academic work
Rules that need to be communicated the first day	1. Where to sit 2. How seats are assigned 3. What to do before the bell 4. Responding, speaking out 5. Leaving at the bell 6. Drinks, food, and gum 7. Washroom and drinking privileges	8. Materials required for class 9. Homework completion 10. Makeup work 11. Incomplete work 12. Missed quizzes and examinations 13. Determining grades 14. Violation of due dates
Rules that can be communicated later	15. Tardiness/absence 16. Coming up to the teacher's desk 17. When a visitor comes to the door 18. Leaving the classroom 19. Consequences of rule violation	20. Notebook completion 21. Obtaining help 22. Note taking 23. Sharing work with others 24. Use of the learning center 25. Communication during group work 26. Neatness 27. Lab safety

Figure 5.4 Issues to Be Decided for Some Classroom Rules

Responding, speaking out

- Must hands be raised?
- Are other forms of acknowledgment acceptable (e.g., head nod)?
- What will happen if a student speaks when others are speaking?
- What will you do about shouting or using a loud voice?

Makeup work

- Will makeup work be allowed?
- Will there be penalties for not completing it?
- Will it be graded?
- Whose responsibility is it to know that work is missing?

Getting out of seat

- When is out-of-seat movement permissible?
- When can a student come to the teacher's desk?
- When can reference books or learning centers be visited?
- What if a student visits another student's desk?

Communicating during group work

- Can a student leave an assigned seat?
- How loudly should a student speak?
- Who determines who can talk next?
- Will there be a group leader?

Determining grades

- What percentage will quizzes and tests contribute to the total grade?
- What percentage will class participation count?
- When will notification be given of failing performance?
- How much will homework count?

Violation of due dates

- What happens when repeated violations occur?
- Where can a student learn the due dates if absent?
- What penalties are there for copying another person's assignment?
- Will makeup work be required when a due date is missed?

Early completion of in-class assignments

- Can work for other classes or subjects be done?
- Can a newspaper or magazine be read?
- Can the next exercise or assignment be worked on?
- Can students rest their heads on their desks?

Rule violation

- Will names be written on the board?
- Will extra work penalties be assigned?
- Will you have after-class detention?
- When will a disciplinary referral be made?

the situation arises. Some are specific to particular situations (for example, safety during a lab experiment, notebook completion, obtaining help) and are best presented in the context to which they apply. This type of rule will be more meaningful and more easily remembered when it applies to a specific circumstance or event. Even though you may not communicate this kind of rule on the first day of school, it is usually required so soon afterward that you will want to compose a procedure for it before your first class day.

Here are several general suggestions for creating classroom rules:

- Specify only necessary rules. There are four reasons to have rules, and each should reflect at least one of these purposes:

  To enhance work engagement and minimize disruption
  To promote safety and security
  To prevent disturbance to others or other classroom activities
  To promote acceptable standards of courtesy and interpersonal relations

- Make your rules consistent with the classroom climate you wish to promote. As a beginning teacher, you should recognize your values and preferences for managing your classroom now, at the start of your career. Articulate your personal philosophy of classroom management, and make sure your class rules reflect it. For example, do you want your classroom climate to emphasize independent judgment, spontaneity, and risk taking, or do you want it to emphasize teacher-initiated exchanges, formal classroom rules, and teacher-solicited responses?
- Do not establish rules you cannot enforce. A rule that says "No talking" or "No getting out of your seat" may be difficult to enforce when your personal philosophy continually encourages spontaneity, problem solving, and group work. Unfairness and inconsistency may result in applying rules you do not fully believe in.
- State your rules at a general enough level to include a range of specific behaviors. The rule "Respect other people's property and person" covers a variety of problems, such as borrowing without permission, throwing objects, and so on. Similarly, the rule "Follow teacher requests" allows you to put an end to a variety of off-task, disruptive behaviors that no list of rules could anticipate or cover comprehensively. However, be careful not to state a rule so generally that the specific problems to which it pertains remain unclear to your learners. For example, a rule stating simply "Show respect" or "Obey the teacher" may be sufficiently vague to be ignored by most of your learners and unenforceable by you. If you follow this suggestion and the preceding one, you should have prepared about four to six classroom rules for your very first day.

Unless you clearly communicate your rules and apply them consistently, all your work in making them will be meaningless. Consistency is a key reason some rules are effective while others are not. Rules that are not enforced or not applied consistently over time result in a loss of prestige and respect for the person who created the rules and is responsible for enforcing them.

Following are the most frequently occurring reasons that particular rules are not applied consistently (Emmer & Evertson, 2009; Evertson & Emmer, 2009):

1. The rule is not workable or appropriate. It does not fit a particular classroom context or is not reasonable, given the nature of the individuals to whom it applies.
2. The teacher fails to monitor students closely, and consequently, some individuals who violate the rule are caught while others are not.
3. The teacher does not feel strongly enough about the rule to be persistent about its enforcement and thus makes many exceptions to the rule.

Keep in mind that making minor deviations from a rule may not be worth your effort when (1) doing so will provide an untimely interruption to your lesson or (2) the situation is only momentary and not likely to recur. However, when problems in applying a rule

persist over time, either increase your vigilance or adjust the rule to allow more flexibility in your response. (For example, coming up to the teacher's desk without permission for help may be acceptable, but coming up just to talk may not be.)

PROBLEM AREAS IN CLASSROOM MANAGEMENT

A primary purpose of effective classroom management is to keep learners actively engaged in the learning process. *Active engagement* means getting learners to work with and act on the material presented, as evidenced by carefully attending to the material, progressing through seatwork at a steady pace, participating in class discussions, and being attentive when called on.

This section describes four events that are particularly crucial for keeping students actively engaged in the learning process: monitoring students, making transitions, giving assignments, and bringing closure to lessons. Following are some effective classroom management practices in each area.

Monitoring Students

Monitoring is the process of observing, mentally recording, and, when necessary, redirecting or correcting students' behaviors. Monitoring occurs when you look for students' active, alert eyes during discussion sessions; their faces down and directed at the book or assignment during seatwork; their hands raised during a question-and-answer period; and, in general, signs that indicate that learners are participating in what is going on. These signs of engagement (or their absence) indicate when you need to change the pace of your delivery, the difficulty of the material, or even the activity itself.

Kounin (1970) used the term *with-it-ness* to refer to a teacher's ability to keep track of many different signs of engagement at the same time. Kounin observed that one of the most important distinctions between effective and ineffective classroom managers is the degree to which they exhibit with-it-ness. Effective classroom managers, who exhibited with-it-ness, were aware of what was happening in all parts of the classroom and were able to see different things happening in different parts of the room at the same time. Furthermore, these effective classroom managers were able to communicate this awareness to their students.

There are several simple ways to increase your with-it-ness and the extent of your students' active engagement in the learning process. One way is to increase your physical presence through eye contact. If your eye contact is limited to only a portion of the classroom, you effectively lose with-it-ness for the rest of the classroom. It is surprising to note that a great many beginning teachers consistently do the following:

- Talk only to students in the middle-front rows.
- Talk with their backs to the class when writing on the chalkboard.
- Talk while looking toward the windows or ceiling.
- Talk while not being able to see all students because other students are blocking their view.

In each of these instances, you see only a portion of the classroom, and the students know it. Visually covering all portions of the classroom is one of the most important ingredients in conveying a sense of with-it-ness.

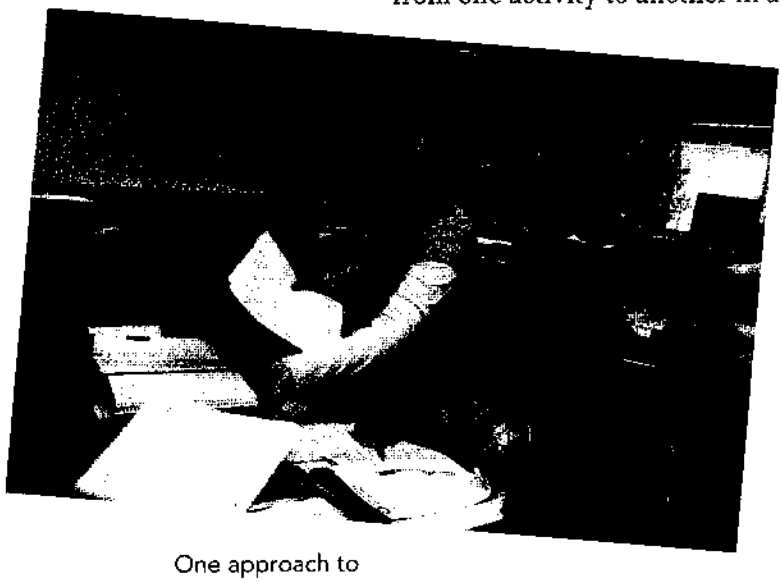
A second ingredient for improving with-it-ness is learning to monitor more than one activity at a time. Here the key is not only to change your eye contact to different parts of the room but also to change your focus of attention. For example, progress on assigned seatwork might be the focus of your observations when scanning students in the front of

the class, but potential behavior problems might be your focus when scanning students in the back of the class.

Switch from conduct-related observations to work-related observations at the same time you change eye contact. However, as you do, be aware of the negative tendency to focus exclusively on one student who is having either conduct- or work-related problems. Once other students realize you are preoccupied with one of their peers, you may have problems in other parts of the classroom.

Making Transitions

Another problem area is *transitions.* It is difficult to keep students' attention during a transition or shift from one instructional activity to another. Moving the entire class from one activity to another in a timely and orderly manner can be a major undertaking. Problems in making these transitions often occur for two reasons: (1) learners are not ready to perform the next activity (or may not even know what it is), and (2) learners have unclear expectations about appropriate behavior during the transition.



One approach to moving the entire class from one activity to another in a timely and orderly manner is to begin new activities on time and visit privately with stragglers later.

When students are uncertain or unaware of what is coming next, they naturally become anxious about their ability to perform and to make the transition. This is the time when a transition can get noisy, with some students feeling more comfortable clinging to the previous activity than changing to the next. The beginning of the school year is a time of noisy transitions, as students fumble to find the proper materials (or guess which ones are needed) and to find out what is expected of them next. They will not rush headlong into a new activity, for fear they will not like it or will be unable to do well.

In this sense, transitions are as much psychological barriers as they are actual divisions between activities. Students must adjust their psychology for the next activity, just as they must adjust their books and papers. You can help in their adjustment by telling them the daily routine you expect of them. This routine will become second nature after a few weeks, but it deserves special attention during the first days of school. This is the time for you to describe the daily activities and the order in which they will occur (for example, 10 minutes of presentation, 15 minutes of questions and discussion, 15 minutes of seatwork, and 10 minutes of checking and correcting).

Table 5.4 provides some suggestions for addressing the problems that occur during transitions.

Giving Assignments

Another crucial time for effective classroom management is when you are giving or explaining assignments. This can be a particularly troublesome time, because it often means assigning work that at least some students will not be eager to complete. Grunts and groans are common student expressions of distaste for homework and other assignments that must be completed outside the regular school day. At times like these, outbursts of misbehavior are most likely to occur.

Evertson and Emmer (1982) found that one difference between effective and ineffective classroom managers was the manner in which they gave assignments, particularly homework. The difference was attributed to several simple procedures that were commonplace among experienced teachers but not among inexperienced teachers.

Table 5.4 Addressing Problems That Occur during Transitions

Problem	Solution
Students talk loudly at the beginning of transitions.	It is difficult to *allow* a small amount of talking and *obtain* a small amount. So establish a no-talking rule during transitions.
Students socialize during the transition, delaying the start of the next activity.	Allow no more time than is necessary between activities (e.g., to close books, gather materials, select new materials).
Students complete an assignment before the scheduled time for it to end.	Make assignments according to the time to be filled, not the exercises to be completed. Always assign more than enough exercises to fill the allotted time.
Students continue to work on the preceding activity after a change.	Give 5-minute and 2-minute warnings before the end of any activity, and use verbal markers such as "Shortly we will end this work" and "Let's finish this up so that we can begin . . ." Create definite beginning and end points to each activity, such as "OK, that's the end of this activity; now we will start . . ." and "Put your papers away and turn to . . ."
Some students lag behind others in completing the previous activity.	Don't wait for stragglers. Begin new activities on time. When a natural break occurs, visit privately with students still working on previous tasks to tell them that they must stop and change. Be sure to note the reason they have not finished (e.g., material too hard, lack of motivation, off-task behavior).
You delay the beginning of the activity to find something (file cabinet keys, materials, roster, references, etc.).	Be prepared—pure and simple! Always have the materials you need in front of you at the start of the activity.

One procedure was to attach assignments directly to the end of an in-class activity. By doing so, the teacher avoided an awkward pause and even the need for a transition, because the assignment was seen as a logical extension of what already was taking place. By contrast, imagine how you might feel being given an assignment under these conditions:

Teacher A: I guess I'll have to assign some homework now, so do problems 1 through 10 on page 61.

Teacher B: For homework, do the problems under Exercise A and Exercise B—and be sure all of them are finished by tomorrow.

Teacher C: We're out of time, so you'll have to finish these problems on your own.

In each of these assignments, there is a subtle implication that the homework may not really be needed or is being given mechanically or as some sort of punishment. Why the homework is being assigned may be a complete mystery to most students, because none of the teachers mentioned either the in-class activities to which the homework presumably relates or the benefits that may accrue from doing the assignment. Students appreciate knowing why an assignment is made before they are expected to do it.

Now consider these assignments again, this time with some explanations added:

Teacher A: Today we have talked a lot about the origins of the Civil War and some of the economic unrest that preceded it. But some other types of unrest also were responsible for the Civil War. These will be important for understanding the real causes behind this war. Questions 1 through 10 on page 61 will help you discover some of these other causes.

Teacher B: We have all had a chance now to try our skill at forming possessives. As most of you have found out, it's harder than it looks. So let's try Exercises A and B for tonight, which should give you just the right amount of practice in forming possessives for our next exercise.

Teacher C: Well, it looks like time has run out before we could complete all the problems. The next set of problems will give you some more practice with what we have learned today. So let's complete the rest of these tonight to see if we've got the concept. This should ensure everyone gets a good grade on the test.

Keep in mind that effective classroom managers give assignments that immediately follow the lesson or activity to which they relate and explain which in-class lesson or activity the assignment relates to. Effective classroom managers also avoid any unnecessary negative connotations (e.g., "Finish them all," "Be sure they are correct," "Complete it on time"), which may make the assignment sound more like a punishment than an instructional activity.

It is also important to convey assignments in a manner that motivates your students to complete them. Table 5.5 summarizes five different ways in which you can convey assignments positively and thus motivate your learners to continue engaging in the activity at a high level of involvement.

Finally, it is always a good idea to display prior assignments somewhere in your classroom so students who have missed an assignment can conveniently look it up without taking your time to remember or find an old assignment. A simple 24" by 30" sheet of poster board, divided into days of the month and covered with plastic, can provide a convenient and reusable way of recording and communicating past assignments on a monthly basis.

Bringing Closure

Another time for effective classroom management is when you are bringing a lesson to its end. This is a time when students sense the impending close of the period and begin

Table 5.5 Some Motivators and Their Appropriate Use

Motivator	Use Phrases Such As . . .
Using praise and encouragement	You've got it. Good work. Good try. That was quick.
Accepting diversity	That's not the answer I expected, but I can see your point. That's not how I see it, but I can understand how others might see it differently. This isn't something I'm familiar with. Where did you get that idea? That isn't a word I've heard before. Tell us what it means.
Providing explanations	The reason this is so important is . . . We are doing this assignment because . . . This will be difficult, but it fits in with . . . Experience has shown that without knowing these facts, the next unit will be very difficult.
Emphasizing reinforcement and reward	All homework completed will earn 5 extra points. If you get a C or better on each of the tests, I'll drop your lowest grade. Those who complete all the exercises on time can go to the learning center. If you have a C average, you get to choose any topic for your term paper.
Offering to help	Should you need help, I'll be here. Ask me for help if you need it. I'll be walking around; catch me if you have a problem. Don't be afraid to ask a question if you're having trouble.

in advance to disengage from the lesson. It is a time when noise levels increase and students begin to fidget with books, papers, and personal belongings in anticipation of the next class or activity.

Closing comments also should serve a double purpose, not only ending the lesson but also keeping students actively engaged in the lesson until its very end by reviewing, summarizing, or highlighting its most important points. Closure, therefore, is more than simply calling attention to the end of a lesson. It means keeping the momentum of a lesson going by reorganizing what has gone before into a unified body of knowledge that can help students remember the lesson and place it into perspective. Following are ways you can keep your learners actively engaged at the end of your lessons and help them retain what you have taught.

Combining or Consolidating Key Points. One way of accomplishing closure is by combining or consolidating key points into a single overall conclusion. Consider the following:

Teacher: Today we have studied the economic systems of capitalism, socialism, and communism. We have found all of these to be similar in that some of the same goods and services are owned by the government. We have, however, found them different with respect to the degree to which various goods and services are owned by the government: The least number of goods and services are owned by a government under capitalism, and the most goods and services are owned by a government under communism.

This teacher is drawing together and highlighting the single most important conclusion from the day's lesson. The teacher is doing so by expressing the highest-level generalization or conclusion from the lesson without reference to any of the details that were necessary to arrive at it. This teacher consolidated many different pieces of information by going to the broadest, most sweeping conclusion that could be made and capturing the essence of all that went before.

Summarizing or Reviewing Key Content. Another procedure for bringing closure to a lesson is by summarizing or reviewing key content. The teacher reviews the most important content to be sure everyone understands it. Obviously, not all of the content can be repeated in this manner, so some selecting is in order, as illustrated by the following:

Teacher: Before we end, let's look at our two rules once again. Rule 1: Use the possessive form whenever an *of* phrase can be substituted for a noun. Rule 2: If the word for which we are denoting ownership already ends in an *s*, place the apostrophe after, *not* before, the *s*. Remember, both of these rules use the apostrophe.

Now the teacher is consolidating by summarizing each of the key features of the lesson. The teacher's review is rapid and to the point, providing students with an opportunity to fill in any gaps about the main features of the lesson.

Providing a Structure. Still another method for closing consists of providing learners with a structure so they can remember key facts and ideas without actually reviewing them. With this procedure, the teacher reorganizes facts and ideas into a framework for easy recall, as indicated in this example:

Teacher: Today we studied forming and punctuating possessives. Recall that we used two rules: one for forming possessives wherever an *of* phrase can be substituted for a noun and another for forming possessives for words ending in *s*. From now on, let's call these rules the *of rule* and the *s rule,* keeping in mind that both rules use the apostrophe.

By giving students a framework for remembering the rules (the *of rule* and *s rule*), the teacher organizes the content and indicates how it should be stored and remembered. The key to this procedure is giving a code or symbol system so students can more easily store lesson content and recall it for later use.

Notice that in each of the previous dialogues, the teacher accomplished closure by looking back at the lesson and reinforcing its key components. In the first instance, the teacher accomplished this by restating the highest-level generalization that could be made; in the second, by summarizing the content at the level at which it was taught; and in the third, by helping students remember the important categories of information by providing codes or symbols. Each of these closings has the potential of keeping your learners engaged when the main part of your lesson has ended. Endings to good lessons are like endings to good stories: They keep you engaged and in suspense and leave you with a sense that you have understood the story and will remember it long afterward.

CULTURALLY RESPONSIVE CLASSROOM MANAGEMENT I

A number of authors have studied the effects of various styles of classroom management with diverse and special-needs learners. Researchers (Cheng, 1996; Cheng et al., 1997; Griggs & Dunn, 1995; Weinstein, Tomlinson-Clarke, & Curran, 2005) found connections between different cultures and the nonverbal and verbal behavioral management techniques of proximity control, eye contact, warnings, and classroom rules. For example, the greater the spatial distance between the teacher and students, the more some students became passive listeners and engaged in off-task behavior. As the teacher moved closer to students, communication tended to become more interactive, with more students following the wishes of the teacher. Standing closer to individual students promoted compliance to classroom rules, because students were drawn into nonverbal forms of communication, such as eye contact and changes in voice and body movement, that send a message of involvement.

Bowers and Flinders (1991) found that the use of space can communicate a sense of social power, which can promote engagement or disengagement. They report the case of a teacher who moved from student to student, checking their work while sitting on a swivel chair with casters. In this manner, the teacher was able to elicit more spontaneous and relaxed student responses, resulting in greater student involvement and compliance with classroom rules. This was especially so among students who, by virtue of their language, culture, or ethnicity, did not wish to be spotlighted in the traditional teacher-dominated manner.

Other research has studied the compatibility of various classroom management techniques with the culture and background of the teacher. Researchers (Cartledge, Gardner, & Ford, 2008; Compton-Lilly, 2000; DeLeon, 1996; Lockwood & Secada, 1999) present convincing arguments that teachers of different cultures interpret disruptive behaviors of children differently. For example, facial expressions during a reprimand have been found to communicate different messages concerning the importance of the reprimand. And research by Delgado-Gaitan (2006), Dillon (1989), and Putnam and Burke (1998) has pointed out that some actions of teachers may unintentionally diminish engagement among minority students and/or build resentment because the actions are culturally incongruent. For example, a teacher who constantly stands over students to monitor them can be seen as threatening. Recall the teacher who moved from student to student on a swivel chair while monitoring their work so as to be at the same level as the student. Dillon (1989) suggests that teachers examine their own value and belief systems to become more aware of how different they may be from their students. Teachers should also use the social organization of the classroom to differentiate their instruction to bridge cultural gaps in these ways:

- Establish an open, risk-free classroom climate, where students can experience mutual trust and confidence sufficiently to express their interests and individual learning needs.
- Plan and structure lessons that meet the interests and needs of students.
- Implement lessons that allow all students to be active learners through activities and responsibilities that are congruent with each learner's history, culture, and abilities.
- Differentiate instruction by adjusting the pace at which assignments are due, creating assignments and materials at graduated levels of difficulty, and providing feedback tailored to an individual learner's current level of understanding.

These are important considerations for establishing a culturally sensitive classroom management system and teaching to the culture, abilities, and special learning needs of students in a heterogeneous classroom.

Another classroom management challenge you are likely to face is teaching learners with special needs who are at risk academically (Kaufman, Alt, & Chapman, 2001; Schargel, 2003, 2005; Smink & Schargel, 2004). **At-risk learners** may struggle academically for many reasons, but among the most prevalent is becoming disengaged because the instructional resources, texts, workbooks, and learning materials that are designed for the majority of students in the classroom are not suitable for these learners. These students often need differentiated instruction, such as special instructional pacing, more feedback, supplemental instruction, and/or modified materials, all administered under conditions sufficiently flexible to keep students actively engaged in the learning process.

Learners who are at risk for poor academic performance usually are taught in one of two possible instructional arrangements: (1) a class composed mostly of average-performing students or (2) a class that is part of a **track system,** in which some sections of math, English, science, and social studies are designated for lower-performing and special-needs students.

The desirability and fairness of various tracking systems has been extensively debated (Free, 2004; Gamoran, 1992; Good & Brophy, 2007; Lou, Abrami, & Spence, 2000; Ready, Behhetto, & LoGerfo, 2005; Slavin, 1991a). The argument typically offered in favor of tracking is that it allows schools to differentiate instruction better by giving high achievers the challenge and low achievers the support they need to learn. Opponents argue that tracking is undemocratic, in that it separates learners into homogeneous groups unrepresentative of the world outside the classroom. Moreover, research has shown that tracking fails to increase learner achievement beyond what can be expected to occur in a heterogeneous classroom (Davenport et al., 1998; Mickelson & Heath, 1999). Time-limited task and ability grouping within heterogeneous classes has produced superior achievement with at-risk learners compared to tracking (Gamoran, 1992; Good & Brophy, 2007; Skirtic, 1991; Slavin, 1990).

Whether you meet at-risk learners in a regular class or in a tracked class, keeping them engaged may require more than the usual variation in presentation methods (e.g., recitation, presentation), classroom climate (e.g., cooperative, competitive), and instructional materials (e.g., practice activities, learning centers).

Some characteristics of these learners that place them at risk for school failure and/or behavioral problems are their deficiency in basic skills (reading, writing, mathematics), their difficulty in dealing with abstractions, and their sometimes unsystematic or careless work habits, which may require instruction in note-taking, listening, and organization skills. When these learning strategies are not provided as part of your instruction, the result can be a performance below the child's potential, beginning a cycle of deficiencies that promotes poor self-concept, misbehavior, and disinterest in school—all of which have contributed to a particularly high dropout rate for at-risk learners (Child Trends DataBank, 2005; Shore, 2003; Walker & Sylwester, 1991).

Stereotypes of at-risk learners, however, have often proven untrue, challenging broad generalizations of the perceptions of students who may be classified as at risk or assigned to lower-performing classes. These students' dispositions and actions are often surpris-

ing, as has been noted in research on resiliency (Benard, 1997; Doll, Zucker, & Brehm, 2004). *Resilient* children are those who seem to defy the odds—becoming productive and happy individuals in spite of having a background that would suggest otherwise. Several long-term studies suggest that resilient children are more numerous than might be expected. Werner and Smith (1992) noted that between 50% and 70% of children born into extremely high-risk environments "grow up to be not only successful by societal indicators but 'confident, competent, and caring' persons" (Benard, 1997, p. 2). In other words, these students—who may be classified by a tracked class, differentiated instruction, or social and emotional behavior—are not necessarily born with the behaviors that put them at risk, nor are these behaviors necessarily unchangeable. Furthermore, many researchers and teachers believe that resiliency can be fostered in all youth.

Here are some instructional strategies that can help keep at-risk learners engaged in your classroom:

- *Develop some lessons around students' interests, needs, and experiences.* Doing so will help heighten the attention of at-risk learners and actively engage them in the learning process. Creating oral or written autobiographies at the beginning of the year or simple inventories in which students indicate their hobbies, jobs, and unusual trips or experiences can provide the basis for lesson plans, projects, and assignments that allow learners to construct their own meanings from direct experience and the interactions they have with others around them.
- *Encourage oral as well as written expression.* For at-risk learners, many writing assignments go unattempted or are begun only halfheartedly because these learners recognize their written work will not meet minimal writing standards. Consider assigning an audio- or videotaped project at the beginning of the school year; this type of project has the advantage of avoiding errors in spelling, syntax, and writing at crucial time in the learner's development.
- *Provide study aids.* Study aids alert students to the most important problems, content, or issues in the material to be learned. They also eliminate irrelevant details that at-risk learners often study in the belief they are important. Examples of test questions or a list of topics for possible questions can help focus student effort.
- *Teach learning strategies.* *Learning strategies* are general methods of thinking that improve learning across a variety of subject areas. Strategies accomplish this by enhancing the way information is received, placed in memory, and activated when needed. You can increase the engagement of at-risk learners by teaching elaboration/organization (e.g., note taking and outlining), comprehension and monitoring (e.g., setting goals, focusing attention, using self-reinforcement), and problem-solving strategies (e.g., vocal and subvocal rehearsal). We will have more to say about these and other learning strategies that you can teach your learners in Chapter 10.

P

If your first class day is like that of most teachers, it will include some or all of these activities (Wong, 2004):

- Keeping order before the bell
- Introducing yourself
- Taking care of administrative business
- Presenting rules and expectations
- Introducing your subject
- Closing

Because your responses in these areas may set the tone in your classroom for the remainder of the year, let's consider your first-day planning in more detail to see how you can prepare an effective routine.

Before the Bell

As the sole person responsible for your classroom, your responsibility extends not just to when your classes are in session but to whenever school is in session. Consequently, you must be prepared to deal with students before your first class begins in the morning, between classes, and after your last class has ended—or any time you are in your classroom. Your first class day is particularly critical in this regard, because your students' before-class peek at you will set in motion responses, feelings, and concerns that may affect them long after the bell has rung. Following are a few suggestions that can make these responses, feelings, and concerns positive ones:

1. To provide a sense of with-it-ness (defined earlier in this chapter), stand near the door as students enter your classroom. In this way, you will come in direct contact with all students and be visible to them as they take their seats. Your presence at the doorway, where students must come in close contact with you, will encourage an orderly entrance (and exit) from the classroom. Remember, your class starts when the first student walks through your classroom door.
2. Have approximately four to six rules, divided between conduct and work, clearly written on the chalkboard, bulletin board, or overhead or in the form of a handout already placed on each student's desk. You may want to prepare rules for the areas shown in the upper half of Figure 5.3 that you feel will be most critical to your classes during the first few days of school. You can formally introduce these rules later, but you should make sure they are clearly posted as students enter your class the first day.
3. Prepare a brief outline of your opening day's routine. This outline should list all the activities you plan to perform that day (or class period), in the order in which you will perform them. You can make a cue card with a simple 4" by 6" index card to remind yourself to do the following:

- Greet students and introduce yourself (5 minutes).
- Take roll (5 minutes).
- Fill out forms (10 minutes).
- Assign books (15 minutes).
- Present rules (10 minutes).
- Remind students to bring needed materials (2 minutes).
- Introduce subject-matter content (or give a brief overview of the daily schedule for the elementary grades) (0 to 10 minutes).
- Close or transition to the normal routine for the elementary grades (3 minutes).

Let's look briefly at several of these activities for your first day.

Introducing Yourself

Introduce yourself by giving your name and stating something special about yourself, such as an area of interest or expertise. Your personality will and should unfold in small degrees during the first few weeks of school. There is no need to rush this process. However, providing a glimpse of the kind of person you are outside the classroom often is a nice touch for students, who would like to see you as a friend as well as a teacher. A short comment about your interests, hobbies, or special experiences—even family or home life—often is appreciated by students, who at the end of this first day will be struggling to remember just who you are.

Administrative Business

Your first opportunity to meet your students up close will be while taking the roll. This is when you may want to turn the tables and have your students not only identify themselves but indicate some of their own interests, hobbies, or special experiences, especially as they may relate to some of the things you will be teaching.

Your other administrative duties at this time can be considerable. In some cases, they can consume most of the remainder of the class period at the upper grades and a full hour or more in the lower grades. Filling out forms requested by the school and school district, checking course schedules, guiding lost students to their correct rooms, and accepting new students during the middle of the class may all be part of your duties this first class day.

Rules and Expectations

Plan to devote some time to discussing your classroom rules and your overall expectations about both conduct and work. This is the time to resolve student uncertainties and let your learners know what to expect. There is no better way to begin this process than by referring to the conduct and work rules that you have either posted for all to see or provided as a handout.

Video Window

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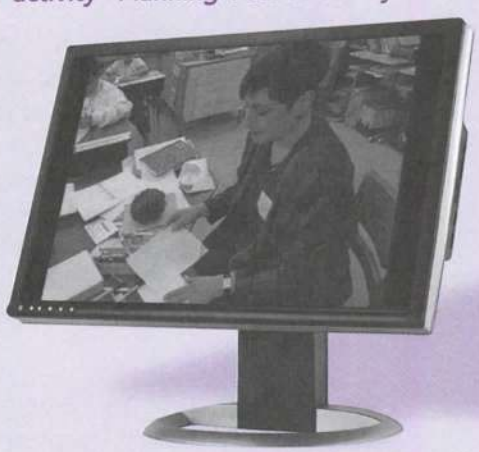
Planning Your First Day

In this video, we find a fourth-grade teacher meeting her class on the first day of school. You will see how this teacher introduces some of the topics and activities you will discuss with your students on that first day. Running throughout this teacher's activities, you will feel the warmth and nurturance she conveys to her students, making each child feel he or she is special in the teacher's eyes. You will see how to dispel the anxiety that young children often feel on the first day of school and how this teacher begins to build, with both her words and actions, a cohesive classroom that will endure the rest of the year. As you watch, identify what this teacher does in each of the following areas to convey expectations for students' conduct and learning, and describe an instance of each:

- Keeping order before and at the beginning of class
- Introducing herself
- Taking care of administrative business
- Introducing her subject
- Closing

Go to the Assignments and Activities section of Topic 3: "Classroom Management" in the MyEducationLab for your course and complete the activity "Planning Your First Day."



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Go to Topic 3: "Classroom Management" in the MyEducationLab for your course, where you can apply and practice your understanding of the core teaching skills identified in the chapter with a Building Teaching Skills and Dispositions learning unit.

Introducing Your Subject

Although you may not have time to present much content on the first day, keep in mind several tips for presenting content during your first lessons:

1. Begin by talking to the whole class. This is a time when not all of your students will be eager to participate in group work or seatwork or be relaxed enough to contribute meaningfully to inquiry or problem-solving activities. These instructional approaches depend on the trust and confidence that students acquire from their experience with you over time. They will be acquiring this trust and confidence during your first days and weeks in the classroom.
2. During your initial days in the classroom, choose content activities that you believe everyone can successfully complete. At this time, you will not yet know the difficulty level most appropriate for your learners, so use this time to gradually try out the types of tasks and activities you eventually will ask your learners to perform. Begin with those from which you expect the most student success.

Closure

Have a definite procedure for closing in mind (for example, a preview of things to come, instructions to follow for tomorrow's class, a reminder of things to bring to class). Begin closing a full 3 minutes before the bell is to ring. End with a note of encouragement that all of your students can do well in your grade or class.

Follow these suggestions, and you will have a great first day!

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 5 content. After reading the case history, go to Chapter 5 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Ms. Ford is a first-year teacher. Her third-grade class includes a large number of students who can be termed at risk according to a variety of standards. Many come from single-parent homes; over two-thirds qualify for reduced-price school lunches; and almost one-third speak a language other than English at home.

It is the third week of the semester, and many of Ms. Ford's worst fears have failed to materialize. Her students have not created any significant classroom management problems. On the contrary, they have been orderly, well behaved, and quiet. Ms. Ford's three classroom rules are posted neatly and clearly on the bulletin board:

Respect other people and their property.
Raise your hand before speaking.
Listen when others talk.

Even though Ms. Ford has spent a great deal of time coming up with clearly defined consequences for not following these rules, she now feels the time has been largely wasted. The problem is not that students speak out without raising their hands; it's that they seldom speak at all. They listen quietly but only to her, because few classmates volunteer oral responses except the most simple one-word answers. The students sit in their alphabetically assigned seats, copy sentences from the board without making a sound, and spend extra effort in forming letters that are as round and perfect as the models in the handwriting exercise.

Ms. Ford had been all set to manage rambunctious 8-year-olds, but now she is at a loss about how to light the spark of engagement in her shy and passive class.

After spending most of the weekend rethinking her classroom strategies, Ms. Ford enters her class on Monday with a new plan. She stands in the doorway as her students enter the classroom, but instead of giving a stoic nod, she now greets them with a smile and a quiet reference here and there to a "pretty new sweater" or "a cool backpack." She allows herself to rub Juan's shortly cropped head and asks him if he is joining the marines. He smiles shyly up at her.

More surprises are in store for the third-graders. Gone are the neat rows of desks, and in their place are tables set in small groups to accommodate five or six students each. "Find your name at a table and be seated there," Ms. Ford tells the students.

The organization is not alphabetical but random, or at least it appears to be. It is not necessary to tell the class that the composition of each group has entailed the same attention to detail as for making a first-draft football selection. At each table are at least two students whose primary language is English, as well as one who seems conversant in both English and Spanish, which is the dominant second language in the class.

Ms. Ford explains, "All of you at the same table will be part of a team that will be working together on several projects and assignments. But first, you will need to get to know each other a little bit better. I thought today we might talk about our favorite animals, since each group will be named after the animal of its choice. Ask yourself this question: If I could be any animal for a single day, what animal would I choose and why?

"I'll start. If I could be any animal I wanted to for a day, I would be a horse—a wild, black stallion in the mountains of Wyoming. I would love to run and feel the wind in my mane, to rear up and paw at the sky, and to run like thunder through the canyons. I think it is the horse's freedom and beauty, its speed and strength, that I admire so much.

"Take a few minutes to think about this yourself, and then take turns telling your group which animal you would like to be."

Ms. Ford is amazed that after less than a minute, many students are already sharing their animal choices. And she is in for a few surprises, too. Shy Patricia, whose eyes always seem downcast, is demonstrating between giggles what her life as a monkey would be like. Romero, who knows only a few English words, is completely at home as a pouncing and growling black panther.

It is with a sly smile of satisfaction that Ms. Ford has to gently remind students, near the end of the session, to keep their voices down.

SUMMING UP

The main points in this chapter include the following:

Earning Trust and Becoming a Leader the Old-Fashioned Way

1. Five types of social power or leadership that a teacher can strive for are expert power, referent power, legitimate power, reward power, and coercive power.

Stages of Group Development

2. Four stages through which a successful group passes are forming, storming, norming, and performing.
3. *Distancing* is a type of amiable limit testing, in which group members challenge academic expectations and rules to establish under what conditions they do or do not apply.
4. *Centering* is a second type of amiable limit testing, in which learners question how they will personally benefit from being a group member.
5. Two basic processes by which norms develop are *diffusion* and *crystallization*. The former occurs when different academic and social expectations held by different members spread throughout the group. The latter occurs when expectations converge and crystallize into a shared perspective.

Establishing an Effective Classroom Climate

6. The *classroom climate* is the atmosphere or mood in which interactions between you and your students take place. A classroom climate can be created by the social environment, which is related to the patterns of interaction you wish to promote in your classroom, and by the organizational environment, which is related to the physical or visual arrangement of the classroom.
7. The social climate of the classroom can range from authoritarian (in which you are the primary provider of information, opinions, and instruction) to laissez-faire (in which your students become the primary providers of information, opinions, and instruction).
8. Your role in establishing authority in the classroom and the social climate can vary. You can adopt different roles, including the following:
   - Commander in chief, who carefully controls and hones student behavior by organizing and providing all the stimuli needed for learning to occur
   - Translator or summarizer of ideas provided by students
   - Equal partner with students in creating ideas and solving problems
9. The social climate of your classroom also can vary, depending on how competitive, cooperative, or individualistic you wish interactions among class members to be. Differences among these include the extent of opportunities for students to express opinions, the time devoted to student talk, and the spontaneity with which your students are allowed to respond.
10. The term *organizational climate* refers to the physical or visual arrangement of the classroom, determined by the positioning of desks, chairs, tables, and other internal features of a classroom.
11. The degree of competition, cooperation, and individuality in your classroom is a result of the social and organizational climate you create.
12. Rules can relate to one or more of four distinct areas:
    - Academic work
    - Classroom conduct
    - Information you must communicate the first day
    - Information you can communicate later
13. Rules can be communicated orally, on the board, on a transparency, or in a handout. Rules for the early elementary grades should be presented orally, provided as a handout, and posted for reference. Rules for the elementary grades and junior high school may be recited and copied by students. Rules for high school may be given orally and then posted.
14. The following suggestions will help you develop classroom rules:
    - Make rules consistent with your climate.
    - Do not make rules that cannot be enforced.
    - Specify only necessary rules.
    - State rules generally enough to include different but related behaviors.
15. Your inability to enforce a rule over a reasonable period of time is the best sign that you need to change the rule.

Problem Areas in Classroom Management

16. Monitoring students, making transitions, giving assignments, and bringing closure are four particularly troublesome areas of classroom management.
17. *With-it-ness* is a form of monitoring in which you are able to keep track of many different signs of student engagement at the same time.
18. You can convey assignments positively and motivate learners in the following ways:
    - Use praise and encouragement.
    - Provide explanations.
    - Offer to help.
    - Accept diversity.
    - Emphasize reward, not punishment.
19. Problems during transitions occur most frequently when learners are not ready to perform the next activity and do not know what behavior is appropriate during the transition.

20. Homework assignments should be given immediately following the lesson or activities to which they relate and without negative connotations.
21. A closing statement should gradually bring a lesson to an end by combining or consolidating key points into a single overall conclusion, by summarizing or reviewing key content, or by providing a symbol system so students can easily store and later recall the content of the lesson.

Culturally Responsive Classroom Management

22. Use the following methods to bridge cultural gaps in the classroom:
    - Establish an open, risk-free climate.
    - Plan lessons that meet student interests and needs.
    - Allow for activities and responsibilities congruent with learners' cultures.

KEY TERMS

At-risk learners, 180
Centering behavior, 162
Coercive power, 161
Crystallization, 164
Diffusion, 164
Distancing behavior, 162
Expert power, 160
Legitimate power, 160
Monitoring, 174
Norms, 164
Organizational environment, 165
Referent power, 160
Reward power, 161
Rules and procedures, 170
Social environment, 165
Social power, 160
Stages of group development, 161
Track system, 180

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. Describe in your own words the two types of social power beginning teachers should most quickly achieve. How would you achieve each?
*2. What is meant by the terms *diffusion* and *crystallization* of norms? In what order can you expect these two basic processes of norm development to occur?
*3. Identify three roles you can assume in your classroom that communicate different levels of authority. How will expression of student opinions, proportion of student talk to teacher talk, and spontaneity of response change as a function of these three roles?
4. Draw three diagrams of the internal features of a classroom, one each to illustrating how to promote a classroom climate that is competitive, cooperative, and individualistic.
5. Identify three academic rules and three conduct rules that you believe will be needed on your first day of class. Write out these six rules as you might show them to your students on a handout or transparency on the first day of class.
*6. Identify two rules for which retention might be improved if they were communicated in the context of a relevant circumstance or incident. Describe each circumstance or incident and why the rule would be necessary.
*7. State three guidelines for developing effective classroom rules. Identify four rules that, in your opinion, follow these guidelines.
*8. Describe a practical strategy for deciding when you should revise or eliminate a rule. Which type of rule, academic or conduct, do you feel needs to be revised most often? Why?
*9. What are four teaching practices that can help avoid misbehavior during a transition? Which one do you feel you would use the most? Why?
*10. What are two ways discussed in this chapter that out-of-class assignments can be made more meaningful and accepted by your students? What other ways can you think of?
*11. Identify three ways you can bring a lesson to a close that will help students organize the lesson in retrospect. Which one best fits the grade or subject matter you will be teaching? Why?

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B.

*1. Identify the four stages of group development and provide some examples of student behavior at each stage.

*2. From your field work or observation experiences, provide some examples of classroom activities that will create (a) a competitive, (b) a cooperative, and (c) an individualistic classroom climate.

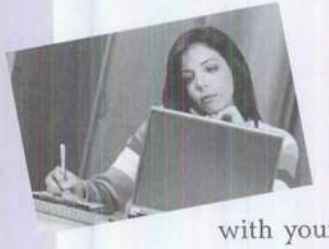
*3. How did a teacher whose class you were working in or observing try to bridge different cultures to form a productive and cohesive classroom?

Digital Portfolio Activity

The following digital portfolio activity relates to INTASC principles 3 and 5.

Place your responses to Field Experience Activities 1 and 3 into your digital portfolio in a folder titled "Classroom Management." These responses will provide examples of your skill at creating a cohesive and nurturing classroom and planning to bridge the gap between different cultures in a heterogeneous classroom.

Classroom Observation Activities



The following classroom observation activities relate to INTASC principles 5 and 6.

1. To record your Classroom Observation, go to Chapter 5 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 5.1. Using this classroom template, draw with your computer three classroom arrangements. In the first, place your classroom furniture, including the teacher's desk and students' desks, to emphasize the acquisition of knowledge, rules, and concepts In the second, emphasize cooperative learning and group inquiry and problem solving. In the third, depict a compromise-based classroom arrangement that will allow some students to work independently at their desks while others work cooperatively in groups. Make each of your classrooms distinctive to your personal tastes and teaching style by adding rugs/pillows, learning centers, computers, and learning resources, where appropriate. During a classroom observation, use this template for drawing the classroom you are observing. Place these drawings in your "Classroom Management" digital portfolio for future reference in planning your own classroom arrangement.
2. Return to Chapter 5 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 5.2, Observing Rules in Frequently Occurring Areas. This form includes categories for which classroom rules are frequently written, such as getting out of one's seat, speaking out, completing assessments,

communicating during group work, and so on. Write one rule for each of the rule areas listed. Place your rules in your "Classroom Management" digital portfolio folder. You will use it for future classroom observations, in which you will record other teachers' classroom rules and add some additional ideas for your own list of rules.

6

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

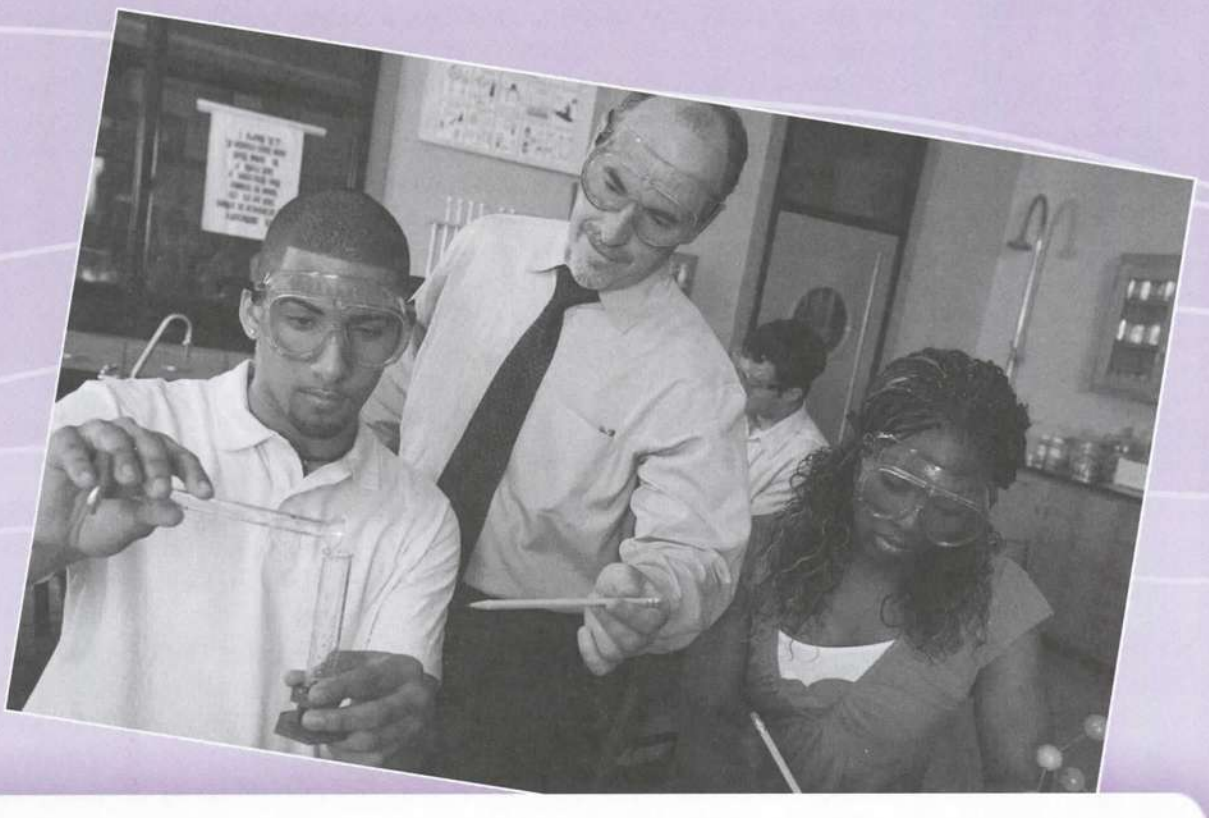
1. What is an effective classroom management plan?
2. What techniques do effective classroom managers use?
3. Which is more effective in changing the behavior of learners: rewards or punishments?
4. How do I plan a parent–teacher conference?
5. What is culturally responsive classroom management?

INTASC

- principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.
- principle 5 The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
- principle 9 The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.
- principle 10 The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well-being.

Classroom Management II

Promoting Student Engagement



Anyone who reads the newspaper, listens to candidates running for public office, attends school board meetings, or overhears conversations in the teachers' lounge quickly realizes that classroom order and discipline are among education's most frequently discussed topics. Inability to control a class is one of the most commonly cited reasons for dismissing or failing to rehire a teacher, and beginning teachers consistently rate classroom discipline as among their most urgent concerns (Kirsch, 2005; Rose & Gallup, 2002; Weiner, 2002).

In Chapter 5, you learned about establishing the climate for a manageable classroom. In this chapter, you will learn specific techniques for preventing disruptive behaviors from occurring and dealing with them efficiently, increasing the time your students are actively engaged in learning.

SYSTEMS OF CLASSROOM MANAGEMENT

Approaches to dealing with classroom management can be grouped into three traditions. One tradition emphasizes the critical role of communication and problem solving between teacher and students. This approach is called the **humanist tradition** of classroom management (Ginott, Ginott, & Goddard, 2003; Glasser, 1998a,b,c; Jones & Jones, 2007; Mendler, Curwin, & Mendler, 2007). The second tradition, which comes from the field of **applied behavior analysis,** emphasizes behavior modification techniques and reinforcement theory applied to the classroom (Alberto & Troutman, 2009; Canter, 2005; Landrum & Kauffman, 2006). The third and most recent approach, which emphasizes the teaching skills involved in organizing and managing instructional activities and presenting content, is called the **classroom management tradition** (Cotton, 1996; Emmer & Evertson, 2009; Evertson & Emmer, 2009). This third approach, more so than the humanistic and applied behavior analysis traditions, underscores the critical role of prevention in managing classroom behavior.

In this chapter, we briefly summarize the main features of these traditions, point out how they are used in the classroom, and show how the best features of each can be seamlessly combined into a single approach. To begin, let's identify six criteria of an effective plan for classroom management:

1. *Establish positive relationships among all learners.* A positive, supportive classroom environment that meets students' needs for building trusting relations is a necessary foundation for managing an orderly classroom. We discussed some of the ways you can build trusting relations among your learners in Chapter 5.
2. *Prevent attention-seeking and work-avoidance behavior.* The time devoted to managing the classroom should be directed to engaging students in the learning process and preventing behaviors that interfere with it. Engagement and prevention involve both the arrangement of physical space and the teaching of rules for working in this space. In the previous chapter, we considered the importance of classroom climate and provided some guidelines and examples for teaching classroom rules.
3. *Quickly and unobtrusively redirect misbehavior once it occurs.* Most classroom problems take the form of minor off-task and attention-seeking behaviors. Techniques for coping with such an event should not cause more disruption than the behavior itself.
4. *Stop persistent and chronic misbehavior with strategies that are simple enough to be used consistently.* Management systems that require responding to every act of positive or negative behavior will not likely be practical for consistent use in today's busy classrooms.
5. *Teach self-control.* Students should be allowed the opportunity to exercise internal control before the teacher imposes external control. When an external control is imposed, it should be implemented with a plan for fading it out.
6. *Respect cultural differences.* Verbal and nonverbal techniques for redirecting disruptive behavior do not mean the same thing to all cultural groups. Likewise, systematic strategies involving rewards and consequences can violate important cultural norms.

Now let's learn about the three approaches to classroom management. As you read about them, reflect on how each meets these criteria and shares some characteristics with the others.

THE HUMANIST TRADITION IN CLASSROOM MANAGEMENT

The principles underlying the humanist tradition come from the practice of counseling and clinical psychology. The approach is called *humanist* because it focuses primarily on the inner

thoughts, feelings, psychological needs, and emotions of the individual learner. Humanist approaches emphasize the importance of allowing the student time to develop control over his or her behavior, rather than insisting on immediate behavioral change or compliance. Teachers using humanist approaches hope to achieve these ends through interventions that stress the use of communication skills, private conferences, and individual and group problem solving; an understanding of student motives; and the exercise of referent and expert power.

Ginott's (1995; Ginott, Ginott, & Goddard, 2003) cooperation through congruent communication (also called the *communication skills approach*), Glasser's (1998b,c) cooperative learning through individual and group problem solving, and Jones and Jones's (2007) cooperative learning and communities of support approaches are all examples of the humanist tradition. Each emphasizes a different area of skill that the effective classroom manager should possess, but all essentially represent the same underlying philosophy.

Congruent Communication

The cardinal principle underlying Ginott's (1995; Ginott, Ginott, & Goddard, 2003) **congruent communication** skills approach is that learners are capable of controlling their own behavior if teachers allow them to do so. Teachers foster this self-control by allowing learners to choose how they wish to change their own behavior and how to run the class. In addition, teachers help their students deal with their inner thoughts and feelings through the use of effective communication skills.

The use of communication skills is the primary vehicle for influencing learners' self-esteem, which in turn is the primary force underlying acceptable behavior. Therefore this tradition tries first and foremost to influence student behavior by enhancing student self-esteem. According to the proponents of this approach, congruent communication is the vehicle for promoting self-esteem.

Teachers have many opportunities during the school day to engage their students in congruent communication, usually during private conferences with students who misbehave. However, such communication also can go on during problem solving with the whole class. At such times, teachers communicate congruently when they do the following:

1. *Express sane messages.* Sane messages communicate to students that their behavior is unacceptable, but they do so in a manner that does not blame, scold, preach, accuse, demand, threaten, or humiliate. Sane messages state what should be done, rather than scold what was done. Consider the statement "Rosalyn, we are all supposed to be in our seats before the bell rings" in contrast to "Rosalyn, you're always gossiping at the doorway and coming late to class."
2. *Accept rather than deny feelings.* Teachers should accept students' feelings about their individual circumstances, rather than argue about them. If a student complains "I have no friends," the teacher should accept his or her feeling of isolation and identify with the student—such as by saying "So you're feeling you don't belong to any group"—rather than try to convince the student that he or she has misperceived the social situation.
3. *Avoid the use of labels.* When talking to students about what they do well or poorly, teachers should avoid terms such as *lazy, sloppy,* and *bad attitude,* as well as *dedicated, intelligent,* and *perfectionist.* Instead teachers should describe in purely behavioral terms what they do or do not like about students—"You have a lot of erasures and whited-out spots on your homework" versus "Your homework is sloppy," "You form your letters correctly" versus "You are a good writer."
4. *Use praise with caution.* Ginott (1995) believes many teachers use praise excessively and manipulatively to control student behavior, rather than to acknowledge exceptional performance. They use praise judgmentally ("Horace, you are a good student"), confuse correctness with goodness (referring to a student who completes work with a minimum of mistakes as a "good child"), praise students who perform minimally acceptable

behavior as a way of influencing other students ("I like the way Joan is sitting in her seat"), and praise so often that the statements lose all significance and are not even heard by the students. Ginott urges teachers to use praise only to acknowledge exceptional performance and in terms that separate the deed from the doer—for example, "That essay showed a great deal of original thought and research."

5. *Elicit cooperation.* Once a teacher and student have identified behavioral concerns, Ginott encourages the teacher to offer the student alternatives to solving the problem, rather than use coercive power to tell him or her what to do. "Cooperate, don't legislate" is a convenient maxim for remembering this point.

6. *Communicate anger.* Teachers are people, too. They get frustrated and angry just like anyone else. Ginott believes teachers should express their feelings through the use of *"I" messages* instead of *"you" messages.* The former focus on your feelings about the behavior or situation that angered you ("I feel unhappy and embarrassed because you talked when the guest speaker was presenting"). The latter puts the focus on the students and typically accuses and blames ("You were rude to the guest speaker"). Use "I" messages when you own the problem—that is, when you are the one who is angry or upset.

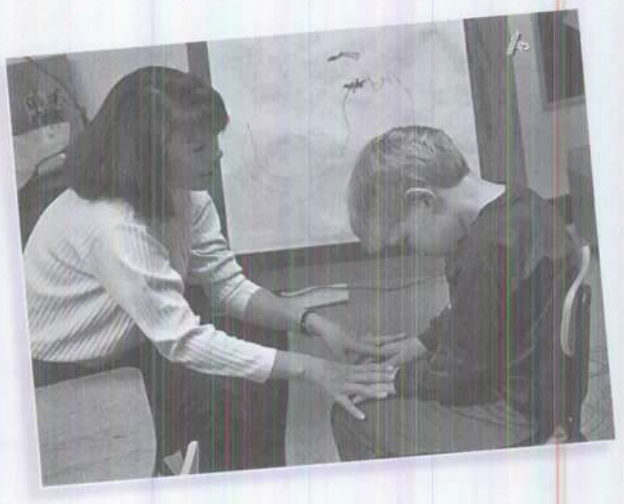
If you were to resolve a classroom management problem using the humanist tradition, you might have an open discussion with your students to draw their attention to the problem. Then you would invite their cooperation in developing mutually agreed-on rules and consequences. Finally, as problems arise, you would have individual conferences with your students, during which you would use the preceding steps 1 through 6 to engage them in congruent communication.

Cooperative Learning

Glasser (1998b,c) points out that effective classroom managers create a learning environment where students want to be, develop mutually agreed-on standards of behavior that students must follow to remain in this environment, and conduct problem-solving conferences with those who violate the standards. Jones and Jones (2007) agree with Glasser that **cooperative learning** is a way to make the classroom a place learners want to be. They believe classrooms that emphasize cooperative learning motivate all children to engage in learning activities and that whole-group instruction, in which students compete with one another for limited rewards, inevitably causes half of all students to be bored, frustrated, inattentive, or disruptive.

According to Glasser (1990) one response to disruptive behavior is discussing the problem with the student. During that time, you stress the importance of right choices and accept no excuses for wrong ones.

For Glasser (1998b,c), dealing with disruptive students is straightforward, given a classroom where students experience belonging, power, and freedom—in other words, a classroom learners would regret leaving. Faced with a student who persists in violating classroom rules the group believes are essential, Glasser recommends that the teacher should hold a brief, private conference with the student, during which the student recalls the rules and the teacher describes the disruptive behavior, asserts the need for following the rules, and makes clear the consequence for not obeying the rules—for example, removal from the room until the learner chooses to follow the rules. Glasser cautions teachers not to accept excuses from students for why they cannot control their own behavior. He disagrees with teachers who use socioeconomic or sociocultural conditions as excuses for learners not making the right choices. For Glasser, there can be no excuse for disrupting an environment designed to meet learners' needs. Furthermore, when faced with removal from such an environment, Glasser believes students will choose and thus not need be forced to behave.



Both Glasser and Jones and Jones (2007) have a clear directive for you as you begin to manage your classroom: Begin building a more friendly workplace based on principles of cooperative learning. Here are specific recommendations:

- Develop with your students rules for the classroom.
- Get support from school administrators for having an area to which disruptive students can be removed.
- Have private conferences with disruptive students, during which you stress the importance of making right choices and accept no excuses for making wrong ones.
- Follow through when students must be removed, but always allow them the opportunity to return when they choose to follow class rules.

THE APPLIED BEHAVIOR ANALYSIS TRADITION IN CLASSROOM MANAGEMENT

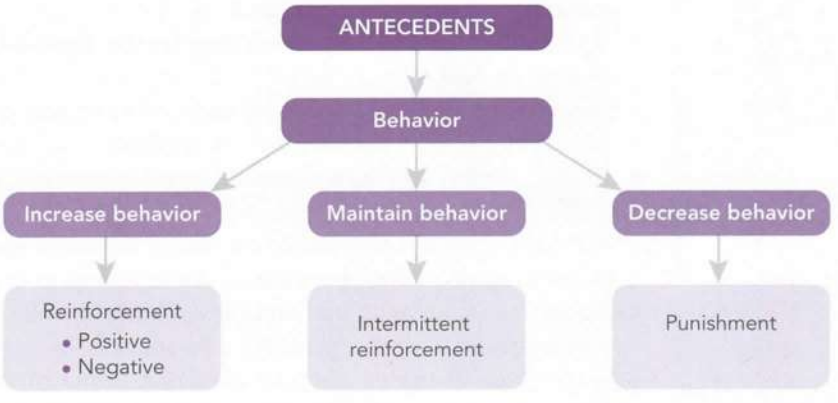
The tradition of applied behavior analysis in classroom management is closely linked with Skinner's (1953) theory of learning, which is called *behaviorism* or *operant conditioning*. The techniques underlying the practice of behavior modification derive from this theory. Application of behavior modification to changing socially important behaviors in the fields of education, business, and the social sciences has been called *applied behavior analysis*. To introduce both the strengths and weaknesses of this tradition, we first review the components of behavior modification that have resulted from this approach.

Behavior Modification

Behavior modification, as its name implies, focuses on changing or modifying behavior. Behavior is something a person does that is seen, heard, counted, or captured—say, in a snapshot or a home video.

Figure 6.1 summarizes some of the most important concepts of behavior modification. As the figure indicates, when you want to teach a new behavior or make an existing behavior occur more frequently (for example, spell more words correctly), you must follow the behavior with some type of reinforcement. Reinforcement can be either positive or negative. **Positive reinforcement** occurs when providing a desired stimuli or reward after a behavior increases it in frequency. **Negative reinforcement** occurs when the frequency of a behavior is increased by ending or removing some painful, uncomfortable, or

Figure 6.1 Process of Behavior Modification



aversive state. In other words, the action you take to stop an annoying sound (shut off the radio), relieve a headache (take an aspirin), or end a frustrating experience (walk away) will likely be repeated again (learned) the next time you experience a similar source of annoyance, discomfort, or frustration.

Negative reinforcement refers to escape or avoidance learning to strengthen the behavior, not simply the application of discomfort or punishment. Thorndike (1913), for example, used negative reinforcement to teach cats how to escape a puzzle box. To get out of the box, the cat had to pull a cord hanging from the top of the box. As soon as the cat pulled the cord, the door opened and the animal escaped. The next time the cat was placed in the same box, it pulled the cord because it had learned how to escape to avoid the uncomfortable condition.

The reason negative reinforcement is important in the classroom is that learners often experience events they want to avoid: boring or difficult work, a scolding, a request to do something they do not want to do, or a direction to stop doing something they want to continue. For example, when a shy student learns that when she does not look at the teacher, the teacher stops calling on her, then this looking-away behavior becomes negatively reinforced by the teacher. The student repeats the behavior to achieve a more desirable state. Similarly, when a learner makes distracting sounds during a lesson to get the teacher to send him out of the room, the teacher negatively reinforces this sound-making behavior. The same thing happens when learners do not pay attention to get the teacher to stop the lesson; their not-paying-attention behavior becomes negatively reinforced. In other words, the teacher has taught (negatively reinforced) these learners to pursue certain behaviors to escape or avoid an unpleasant condition.

As these examples illustrate, a teacher may inadvertently fall into the trap of negative reinforcement that learners unconsciously set. In fact, some psychologists believe more inappropriate behavior is learned through negative than positive reinforcement—that is, by learning what it takes to avoid or escape something undesirable than by being rewarded for doing something appropriate (positive reinforcement) (Iwata, 1987).

When you are satisfied with a particular behavior and how frequently it occurs, apply **intermittent reinforcement** to maintain the behavior at its present level. For example, consider a student who at the start of the school year was consistently late and unprepared for class but now is beginning to arrive on time. You can maintain this behavior by reinforcing the student on a random or intermittent schedule—for example, every second day, every fourth day, or on randomly selected days. An example of intermittent reinforcement is putting tokens into a slot machine long after your last win or fishing in the same spot long after your last nibble.

Behavioral antecedents are events (or stimuli) that are present when you perform a behavior that elicits or sets off the behavior. Antecedents can be any of the following:

- *Sounds.* A noisy room influences students to become more noisy, an insult from a peer influences you to give an insult back, or the tone of voice in a teacher's demand influences a child to argue back
- *Sights.* The teacher raises a finger to the lips to indicate silence or flips the light switch on and off
- *People.* The principal walks in and everyone gets quiet
- *Materials.* Math worksheets elicit a groan
- *Places.* The auditorium elicits different behaviors than the principal's office

Behaviorists believe that much of our behavior has come under the control of antecedents (called *antecedent control*) because of the repeated pairing of reinforcers or punishers following the behavior with environmental stimuli (sounds, sights, people, and materials).

Applications of these principles to schools have produced a variety of systems or procedures for changing student behavior. Some of these procedures involve ignoring disruptive behavior and immediately reinforcing positive behavior. The assumption un-

derlying these procedures is that disruptive students may have learned misguided ways of satisfying their need for recognition. These disruptive behaviors will become less frequent when students learn they will only gain recognition and rewards (receive positive reinforcement) when they behave well.

Other systems are built on the assumption that children learn desired behavior most efficiently when adults immediately punish inappropriate behavior and immediately reward appropriate behavior. Proponents of these systems believe that behavior will improve more rapidly when adults use both timely punishment and timely reward, rather than either punishment or reinforcement alone. These systems routinely involve such punishment procedures as *time-out,* in which the teacher immediately removes the student to an area where he or she can experience no reinforcement of any kind following a disruptive act; *response cost,* in which the teacher removes a student's privilege or reinforcer contingent on disruptive behavior (also called *fines*); and *overcorrection,* in which the student not only makes amends for what he or she did wrong but also goes beyond it by contributing something positive. For example, a student who defaces a desk not only must clean the desk he wrote on but must clean every other desk in the room as well, or a student who insults another student apologizes both to that student and to the whole class.

Although specific approaches may vary, your request to an applied behavior analyst for help with a behavior problem would likely produce the following steps for improving a learner's behavior:

1. Identify both the inappropriate behavior you wish to change and the appropriate behavior you want to take its place.
2. Identify the antecedents to both the inappropriate and appropriate behavior (for example, an influential peer), and make necessary changes in the classroom environment (for example, change the seating arrangement) to prevent the former from occurring and to increase the likelihood of the latter.
3. Identify the student's goal or purpose behind the inappropriate behavior (for example, attention seeking), and discontinue actions on your part (or those of peers) that satisfy this purpose.
4. Establish procedures for reinforcing the appropriate behavior that you want to replace the inappropriate behavior.
5. Use punishment only as a last resort.

T

Throughout much of the latter half of the 20th century, classroom discipline was focused on the issue of how best to respond to student misbehavior. The humanist and the applied behavior analysis approaches to classroom management shared the spotlight about equally during this period. As shown in the previous sections, both of these traditions are primarily reactive rather than preventive systems of classroom management. That is, they tend to provide solutions to misbehavior after it occurs, not before.

More recent research, however, has provided another approach to classroom management that frames the question of classroom order and discipline not in terms of reaction but prevention. This approach is based on classroom research that examined what effective teachers do to prevent misconduct and what less effective teachers do to create it. Some of this research involved observation and analysis of both experienced and inexperienced teachers while they taught. The major conclusion of this research was that more effective and less effective classroom managers can be distinguished more by what they do to prevent misbehavior than how they respond to misbehavior. In this section, we explain how the researchers came to this conclusion and the characteristics of effective classroom managers they found. But first, let's look at one study of classroom management and how it was conducted.

Emmer, Evertson, and Anderson (1980) recruited 27 third-grade teachers in eight elementary schools for a year-long observation study. During the first 3 weeks of school, observers gathered several types of information on each of the teachers, including room arrangement, classroom rules, consequences of misbehavior, response to inappropriate behavior, consistency of teacher responses, monitoring, and reward systems. In addition, observers counted the numbers of students who were on task and off task at 15-minute intervals to determine the extent to which students were attending to the teacher. From these data, the researchers classified the teachers into two groups—one consisting of the more effective managers and the other consisting of the less effective managers—for more in-depth observation the rest of the year.

Those teachers who were categorized as more effective classroom managers were found to have significantly higher student engagement rates (more students actively engaged in the goals of the lesson) and significantly lower student off-task behavior (fewer reprimands and warnings) during the rest of the school year. The more effective managers established themselves as instructional leaders during the first 3 weeks of the school year. They worked on rules and procedures until students learned them. Instructional content was important for these teachers, but they also stressed group cohesiveness and socialization, achieving a common set of classroom norms. By the end of the first 3 weeks, these classes were ready for the rest of the year.

In contrast to the more effective managers, the less effective managers did not have procedures worked out in advance. This was most evident among the first-year teachers being observed. For example, the researchers described one new teacher who had no procedures for students using the bathroom, pencil sharpener, or water fountain, and as a result, the children seemed to come and go, complicating the teacher's instructional tasks. The poorer managers, like the better managers, had rules, but they presented and followed up on the rules differently. In some cases, the rules were vague: "Be in the right place at the right time." In other cases, they were introduced casually without discussion, leaving it unclear to most children when and where a rule applied.

The poorer managers were also ineffective monitors of their classes. This was caused in part by the lack of efficient routines for pupil activities. In other cases, this was the result of teachers removing themselves from active surveillance of the whole class to work at length with a single child. A major result of the combination of vague and untaught rules and poor procedures for monitoring and establishing routines was that students were frequently left without sufficient guidance to direct their own activities.

One further characteristic of the less effective managers was that the consequences of good behavior and inappropriate behavior were either not in evidence or were not delivered in a timely manner. For example, sometimes teachers issued general criticisms that failed to identify a specific offender or a particular event. Some of these teachers frequently threatened or warned children but did not follow through, even after several warnings. This tended to allow children to push the teacher to the limits, causing more problems. Other teachers issued vague disciplinary messages ("You're being too noisy") that were not adequately focused to capture the attention of any one child or subgroup of children for whom they were intended.

In sum, deficiencies in the areas of setting rules, establishing routines, monitoring, and creating a praise and reward structure clearly had a negative effect on the overall management and organization of the classroom. Most of the time, these deficiencies provided windows of opportunity for a wide range of pupil misconduct, off-task behavior, and disengagement from the goals of the classroom. In the less effective managers' classrooms, after only a few weeks had elapsed, undesirable patterns of behavior and low teacher credibility had tended to become established, and both persisted throughout the school year.

From this and related studies of classroom management (Emmer & Evertson, 2009; Evertson, 1995; Evertson & Emmer, 2009; Tauber, 1990), we learn that effective classroom managers possess three broad types of teaching behaviors:

- They devote extensive time before and during the first few weeks of school to plan and organize their classrooms to minimize disruptions and enhance work engagement.

- They approach teaching rules and routines as methodically as they approach teaching their subject areas. They provide students with clear instructions about acceptable behavior and monitor students' compliance with these instructions carefully during the first few weeks of school.
- They inform students of the consequences for breaking the rules and enforce these consequences consistently.

As you can see, the classroom management tradition is essentially a preventive approach. It suggests ways to ensure that behavior problems do not occur. However, it offers few immediate solutions for what to do after the problem has occurred, because it emphasizes planning in anticipation of problems, not resolving them afterward. You will need a comprehensive plan incorporating elements of all three traditions to make your classroom a positive environment for learning.

An Integrated Approach to Classroom Management

All three approaches to classroom management have advantages and limitations. Although each has made a significant contribution to our understanding of effective classroom management, teachers do not need to select one tradition over another. In fact, the research conducted and reported by Emmer, Evertson, and Anderson (1980), Emmer and Evertson (2009), Evertson and Emmer (1982, 2009), and Doyle (1986) has shown that effective classroom managers are able to blend the best parts of different approaches. Figure 6.2 summarizes the three approaches to classroom management.

Now let's look at some of the ways effective teachers put these approaches into practice.

Low-Profile Classroom Management

Logan (2003), Rinne (1997), and Leriche (1992) use the concept of **low-profile classroom management** to refer to coping strategies used by effective teachers to stop misbehavior without disrupting the flow of a lesson. These techniques are effective for so-called

Figure 6.2 Summary of Three Approaches to Classroom Management

Humanist Tradition	Applied Research Tradition	Classroom Management Tradition
Focuses on the feelings, psychological needs, and emotions of the individual learner	Focuses on changing or modifying inappropriate behavior once it has occurred	Focuses on the prevention of misbehavior as opposed to ways of dealing with it after it has occurred
Incorporates interventions that stress communication skills, private conferences with the learner and parents, and individual and group problem-solving skills	Incorporates teacher behaviors that positively reinforce the learner, and eliminates teacher behaviors that negatively reinforce the learner	Incorporates classroom rules, consequences, and routines to keep students on task and actively engaged
Emphasizes cooperative grouping and emotional support networks composed of other learners and teachers	Emphasizes the immediate reinforcement of positive behavior and punishment together	Emphasizes time before and during the first few weeks of school to plan and organize the classroom to minimize disruptions and enhance work engagement
Advocates adherence to rules and time-out or removal for short periods, when necessary	Advocates time-out, response cost, and overcorrection	Advocates giving learners clear instructions in advance about acceptable behavior and monitoring student compliance

Figure 6.3 Characteristics of Low-Profile Classroom Management

surface behaviors (Levin & Nolan, 2006), which represent the majority of disruptive classroom actions. Examples of surface behaviors are laughing, talking out of turn, passing notes, daydreaming, not following directions, combing hair, doodling, humming, tapping, and so on. They are called *surface behaviors* because they are the normal developmental behaviors that children find themselves doing when confined to a small space with a large number of other children. These behaviors do not indicate some underlying emotional disorder or personality problem. However, they can disrupt the flow of a lesson and others' engagement in work if left unchecked.

Figure 6.3 depicts the components of low-profile classroom management. Low-profile management for dealing with surface behaviors is actually a set of techniques that requires *anticipation* by the teacher to prevent problems before they occur, *deflection* to redirect disruptive behavior that is about to occur, and *reaction* to unobtrusively stop disruptions immediately after they occur. Let's look at each of these.

Anticipation. Alert teachers have their antennae up to sense changes in student motivation, attentiveness, interest level, and excitability as these changes happen or are about to happen. These teachers are aware that at certain times of the year (before and after holidays), week (just before a major social event), or day (right after an assembly or physical education class), students' readiness for doing work will be different from what usually can be expected. Skilled classroom managers are alert not only to changes in the group's motivational or attention level but also to changes in specific individuals, which may be noticed as soon as they enter class.

At these times, anticipation involves scanning back and forth with active eyes to quickly size up the seriousness of a potential problem and head it off before it emerges or becomes a bigger problem. For example, you may decide to pick up the pace of instruction to counter some perceived lethargy after a 3-day weekend or to remove magazines or other objects that may distract students' attention before a long holiday. Some teachers maintain a reserve of activities that are likely to boost students' interest during times when it is difficult to stay focused on normal day-to-day activities. Other teachers boost interest by forcing themselves to be more positive or eager in the face of waning student enthusiasm—for example, by raising and lowering the pitch of their voice and moving to different parts of the room more frequently. At other times, it may be necessary to quickly change seating arrangements to minimize antagonism when arguments occur between students.

Anticipation involves not only knowing what to look for but also where and when to look for it. It also involves having a technique ready, no matter how small, for changing the environment quickly and without notice to prevent the problem from occurring or escalating.

Deflection. As noted, good classroom managers sense when disruption is about to occur. They are attuned to verbal and nonverbal cues that in the past have preceded

disruptive behavior. Applied behavior analysts call these behavioral cues *antecedents* or *precursors*. They take the form of a glance, abruptly closing a book, sitting and doing nothing, squirming, asking to be excused, ignoring a request, sighing in frustration, or showing a facial expression of annoyance or anger. Although not disruptive by itself, any of these behaviors may signal that more disruptive behavior is about to follow.

Some teachers can detect the significance of antecedents and deflect them by simply moving nearer to the student who may be about to misbehave, thus preventing a more disruptive episode from occurring. Other teachers may make eye contact with the learner combined with a certain facial expression—for example, raising the eyebrows or slightly tilting the head—to communicate a warning. Both these techniques effectively use nonverbal signals to deflect a potential problem.

Verbal signals are also effective. Verbal deflection techniques include *prompting*, in which the teacher reminds the class of the rule or says, "We are all supposed to be doing math now"; *name dropping*, in which the teacher inserts the target student's name into the explanation or presentation, as in "Now if Angela were living in Boston at the time of the Boston Tea Party, she might have . . ."; and *peer recognition*, in which the teacher notices a peer engaged in appropriate behavior and acknowledges this to the class. As the potential for the problem to escalate increases, the effective manager shifts from nonverbal to verbal techniques to keep pace with the seriousness of the misbehavior that is about to occur.

Reaction. Anticipation and deflection can efficiently and unobtrusively prevent actions from disrupting the flow of a lesson. Using these techniques allows students the opportunity to correct themselves, thus fostering the development of self-control. However, the classroom is a busy place, and you will have many demands on your attention, which may make a behavior difficult to anticipate or to deflect.

When disruptive behavior occurs that you cannot anticipate or unobtrusively redirect, your primary goal should be to end the disruptive episode as quickly as possible. Effective classroom managers, therefore, must at times react to a behavior by providing a warning or incentive to promote positive self-control. Your reaction requires first that you have included among your class rules one that corresponds with the behavior in question and the consequences for violating the rule. Glasser (1998a) points out that an effective consequence for breaking a rule is temporary removal from the classroom (provided your classroom is a place that the student wants to be), school detention, or loss of privileges, recess, or some other activity the learner will miss.

When disruptive behavior occurs, your anticipation-deflection-reaction should be similar to the following:

1. As soon as a student disrupts the class, acknowledge a nearby classmate who is performing the expected behavior: "Carrie, I appreciate how hard you are working on the spelling words." Then wait 15 seconds for the disruptive student to change his or her behavior.
2. If the disruption continues, say, "Carlos, this is a warning. Complete the spelling assignment and leave Carrie alone." Wait 15 seconds.
3. If the student does not follow the request after this warning, say, "Carlos, you were given a warning. You must now leave the room for 5 minutes [or you must stay inside during lunch, or you cannot go to the resource center today]. I'll talk to you about this during my free period."

Dealing with Persistent Disruptive Behavior

When used skillfully, the low-profile techniques of anticipation, deflection, and reaction should promote lesson flow. Occasionally, when these techniques do not work for a particular student or group of students, it may be a sign that the individual learning needs of the student or students are not being met. When disruptive behavior persists and you

Video Window

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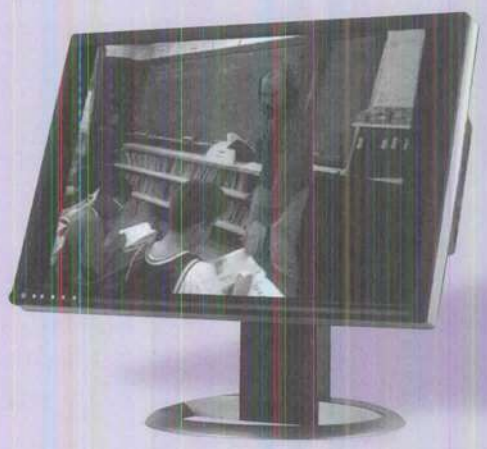
Low-Profile Classroom Management

In this video, you will see two teachers—one in an elementary school and another in a middle school—applying low-profile classroom management. You will see examples of anticipation, deflection, and reaction in response to student misbehavior in an effort to dispense with a problem quickly and not disrupt the flow of the lesson. Identify an instance of each of the three low-profile techniques, and comment on its effectiveness in modifying the behavior of each student. Using the words in Figure 6.2 as your guide, describe what each teacher does to anticipate, deflect, and react in response to a student's behavior.

Go to the Assignments and Activities section of Topic 3: "Classroom Management" in the MyEducationLab for your course and complete the activity "Low-Profile Classroom Management."



have assured yourself that you have taken low-profile steps to deal with it, you may need to increase the intensity of your involvement in responding to the problem.

Responding to Misbehavior

You can respond to misbehavior in many ways. You may choose to ignore an infraction, if it is momentary and not likely to recur (for example, when students jump out of and back into their seats to stretch their legs after a long assignment). At the other extreme, you may call an administrator to help resolve the problem. Between these extremes are many alternative responses, listed here in order of increasing severity:

- Look at the student sternly.
- Move closer to the student.
- Call on the student to provide the next response.
- Ask the student to stop.
- Discuss the problem with the student.
- Assign the student to another seat.
- Assign punishment, such as an extra assignment.
- Assign the student to detention.
- Write a note to the student's parents.
- Call the student's parents.

These alternatives vary in severity from simply giving the student a look of dissatisfaction to involving the parents in resolving the problem. More important than the variety these alternatives offer, however, is your ability to match the correct response to the type of misbehavior that has occurred. One of the most difficult problems you will encounter in effectively maintaining classroom discipline will be deciding on a response that is neither too mild nor too severe (Emmer & Evertson, 2009; Evertson & Emmer, 2009; Manning & Bucher, 2006; Sugai, 1996).

Although every rule violation must consistently receive a response, the severity of the consequence can and should vary according to the nature of the violation and the frequency with which it has occurred in the past. If you respond too mildly to a student who has violated a major rule many times before, nothing will likely change. If you respond too severely to a student who commits a minor violation for the first time, however, you will be unfair. Being flexible is important in resolving different discipline problems and should include taking into account both the context in which the violation occurs and the type of misbehavior that has occurred.

Here are some guidelines for dealing with mild, moderate, and severe misbehavior:

- Mild misbehaviors—like talking out, acting out, getting out of seat, disrupting others, and similar misbehaviors—deserve a mild response, at first. But if they occur repeatedly, a moderate response may be appropriate. In unusual cases, such as continual talking that disrupts the class, a severe response may be warranted.
- Moderate misbehaviors—like cutting class, being abusive toward others, fighting, and using profanity—deserve a moderate response, at first. But if these behaviors become frequent, a severe response may be warranted.
- Severe misbehaviors—like theft, vandalism, incorrigible conduct, and substance abuse—deserve a severe response. But do not try to manage these behaviors in your classroom. Immediately bring them to the attention of school administrators.

Table 6.1 presents some responses you can make to mild, moderate, and severe misbehavior.

Reinforcement Theory Applied in the Classroom

There are multiple ways to use your authority in managing discipline problems (for example, you alone decide the consequence; you have students share in the responsibility; you choose the consequence from alternatives provided by the student) and multiple levels of response severity (from a stern glance to calling parents). But still more options exist. In this section, you will learn how learners respond to reward and to punishment, why they respond to them differently, and how you can use both effectively in your classroom.

Reinforcement theory states that behavior can be controlled by the consequences that immediately follow it. The word *controlled* means the consequences of a particular behavior can change the likelihood that the behavior will recur. Consider the following:

Event	Consequence	Future Event
You start going to the library to study.	Your test scores go up.	You begin going to the library more often.
You go to a new restaurant.	You get lousy service.	You never go there again.
You give your boyfriend or girlfriend a word of encouragement before a big test.	He or she gives you a kiss and a hug.	You give a word of encouragement before every big test.

When the consequence following a behavior changes the probability of that behavior occurring (test scores go up; you do not go there again; you get more kisses and hugs), reinforcement has occurred.

In your classroom, many events and their consequences will demonstrate the effects of reinforcement—whether you intend it or not. You may be surprised to learn you are unintentionally increasing the frequency of some misbehaviors in your classroom through reinforcement. How can this happen? Consider another sequence of behaviors that, unknown to you, may occur in your classroom:

Event	Consequence	Future Event
Shane cheats on a test.	He gets a good grade.	Shane plans to cheat again.
Carla passes a note to her boyfriend.	Her boyfriend passes the note back.	Carla buys a special pad of perfumed paper for writing notes in class.
Bobby skips school.	He earns $5 helping a friend work on a car.	Bobby plans to skip again the next time his friend needs help.

Table 6.1 Examples of Mild, Moderate, and Severe Misbehaviors and Some Alternative Responses

Misbehaviors	Alternative Responses
Mild misbehaviors	**Mild responses**
Minor defacing of school property or the property of others	Warning
Acting out (horseplay, scuffling)	Feedback to student
Talking back	Time-out
Talking without raising hand	Change of seat assignment
Getting out of seat	Withdrawal of privileges
Disrupting others	After-school detention
Sleeping in class	Telephone call/note to parents
Tardiness	
Throwing objects	
Exhibiting inappropriate familiarity (kissing, hugging)	
Gambling	
Eating in class	
Moderate misbehaviors	**Moderate responses**
Unauthorized leaving of class	Detention
Abusive conduct toward others	Behavior contract
Noncompliance	Withdrawal of privileges
Smoking or using tobacco in class	Telephone call/note to parents
Cutting class	Parent conference
Cheating, plagiarizing, or lying	In-school suspension
Using profanity, vulgar language, or obscene gestures	Restitution for damages
Fighting	Alternative school service (e.g., cleaning up, tutoring)
Severe misbehaviors	**Severe responses**
Defacing or damaging school property or the property of others	Detention
Theft, possession, or sale of another's property	Telephone call/note to parents
Truancy	Parent conference
Being under the influence of alcohol or narcotics	In-school suspension
Selling, giving, or delivering to another person alcohol, narcotics, or weapons	Removal from school or alternative school placement
Teacher assault or verbal abuse	
Incorrigible conduct, noncompliance	

In each instance, an undesirable behavior was reinforced (with a good score, a returned note, $5). In each case, the probability of recurrence increased because the consequence was desirable. In each case, there is nothing you could have done, because your vigilance cannot be perfect: You didn't know about the cheating, the note, or that school was missed for the wrong reason. But here are some ways you may unwittingly reinforce undesirable behaviors, which you can do something about:

- A student complains incessantly that her essay was graded too harshly. To quiet her, you add a point to her score. Reinforced, she complains after every essay for the rest of the year.
- Parents complain to you about their child's poor grade for class participation. You start calling on the student more often, probing and personally eliciting her responses. Reinforced, the student believes she no longer needs to volunteer or raise her hand.
- A student talks back every time you call on him, so you stop calling on him. Reinforced, he does the same in his other classes—to be left alone.

In each of these cases, the link connecting the behavior, the consequence, and the student's perception of the consequence might not be immediately apparent to you. Nevertheless, reinforcement of an undesirable behavior occurred. The problem in each instance is that you chose to remove the misbehavior in a way that rewarded the student, thereby actually reinforcing the misbehavior. Notice that in each case, you considered the consequence of your actions only from your own point of view (for example, quieting an annoying student, preventing a parent from calling back, avoiding an ill-mannered student), without realizing that your actions reinforced the very behavior you wished to discourage.

Now that you see how reinforcement theory works, here are some guidelines for making it work for you, not against you.

Rewards and Reinforcement. Many types of rewards and reinforcement can be used to increase the probability of a desirable response. A reward or reinforcement can be *external,* delivered by some other person, or *internal,* provided by the learner himself or herself. Here are some familiar external rewards commonly found in the classroom:

- Verbal or written praise
- Smile or a head nod
- Special privileges (for example, a visit to the learning center, library, etc.)
- Time out from regular work to pursue a special project (e.g., science exhibit)
- Permission to choose a topic or assignment
- Getting to work in a group
- Extra points toward a grade
- "Smiley face" stickers on assignments
- Note to the parents on a test or paper
- Posting a good exam or homework for others to see
- Special recognitions and certificates (for example, "Most Improved," "Good Conduct Award," "Neatest," "Hardest Worker," etc.)

Rewards consistent with the goals of your classroom and matched to student interests keep learners engaged in the learning process and responding at high rates of success.

Not all of these external rewards may be equally reinforcing, however. Some learners may disdain verbal praise; others will have no desire to visit the library or learning center. Some students like to be called on; shy students won't like the added attention. A reinforcement for one student may be completely irrelevant to another.

Educators have sometimes been criticized for creating a generation of learners who are hooked on artificial or extrinsic rewards and thus need them to learn and behave in classrooms. This has led to an increased interest in the use of internal rewards, also called **natural reinforcers.** An internal (natural) reward or reinforcer is one that is naturally present in the setting where the behavior occurs.

Some learners are naturally reinforced by learning to write, read, color, answer questions, play sports, solve equations, answer textbook questions, or write essays. But some are not. Many learners may require external reinforcers to begin to engage in certain

classroom activities they do not find naturally reinforcing. For such children, external reinforcers have two important roles to play: (1) They allow you to shape and improve the behaviors you desire through the use of positive reinforcement, and (2) they enable you to transfer their control over the learner's behavior to natural reinforcers. This transfer from external to internal control is called **operant conditioning** (Woolfolk, 2010). Over the past decade, researchers have developed strategies for transferring the control of extrinsic reinforcers to that of natural reinforcers. Here are the steps they recommend:

1. Select the target behavior. This could be forming letters correctly, solving multiplication problems, drawing geometric figures, bisecting angles, writing compositions, or whatever is appropriate.
2. Identify the natural consequences of the selected behavior. For example, writing on a piece of paper produces many natural consequences: a scratching sound, the formation of letters, the filling up of a page, and the gradual wearing away of a pencil post. Writing an essay has similar natural consequences but also produces sentences that express thoughts, ideas, images, and so on.
3. Choose intrinsic consequences. From your list of natural consequences, select those that will likely be reinforcing to the student and relevant to the purpose of the activity. For example, the formation of the letters is a more appropriate consequence to focus on than the scratching sound on the paper or the filling up of the page.
4. *Identify those consequences the learner may more easily notice.* The more conspicuous the consequence to the learner, the easier it will be to condition this as a natural reinforcer. For example, the shape of a printed word is a conspicuous consequence of correct handwriting and may serve as a natural reinforcer. Likewise, writing a complete thought, coming up with the answer that matches that in the back of the textbook, and feeling satisfied after finishing something can all serve as natural reinforcers.
5. *Design your lessons in such a way that you make conspicuous the occurrence of natural consequences.* Rather than focus only on the right answer to a problem, point out and describe for the learner the sequence involved in solving the problem. In general, focus on how something was done, not just on what results. Some learners may not notice or direct their attention to the natural consequences of their work. By setting up instructional conditions to do this, you allow for natural reinforcers to acquire power over their behavior.
6. *Select appropriate backup reinforcers.* To transfer the power an extrinsic reinforcer has over behavior to a natural consequence, you must select extrinsic or backup reinforcers. These reinforcers should have educational value, be available in your classroom, and ideally involve you in the reinforcing activity.
7. *Condition the natural reinforcer.* Have your learners engage in the behavior. As soon as possible, give informational feedback, pointing out the natural consequences that you hope will become natural reinforcers. Then immediately give the backup extrinsic reinforcers. Gradually remove these reinforcers from the learning setting, but continue to point out and illustrate the natural consequences of what the learner did. Gradually point out the natural consequences less and less. Deliver and intermittently pair the backup reinforcers with the natural reinforcers.

Punishment

Punishment is used to decrease the probability or likelihood that a behavior will occur. For example, you can try to keep Daniel in his seat either (1) by giving him an extra assignment every time he is out of his seat or (2) by giving him a trip to the reading center for every 30 minutes he stays in his seat. In the first instance, you are giving Daniel a punishment to encourage him to do what is expected, and in the second, you are giving him a reward to achieve the same end. Punishment creates an avoidance response to an undesirable

behavior. In contrast, a reward encourages the recurrence of a desirable behavior by dispensing something pleasant or rewarding immediately after the desirable behavior.

But rewards and punishments generally are not equally effective in promoting a desired behavior. Given two choices to keep Daniel in his seat—the punishment of extra homework or the reward of something interesting to work on—the reward usually will be more successful. Here are several reasons:

- *Punishment does not guarantee the desired response will occur.* The extra homework may indeed keep Daniel in his seat the next time he thinks of moving about, but it by no means will ensure he will pursue the truly desired behavior, which is to perform some meaningful instructional activity while he is there. Instead he may daydream, write notes to friends, or even pull Rebecca's hair. All these behaviors succeed in keeping him from being punished again for getting out of his seat. Punishment in the absence of rewards can create other undesired behaviors.
- *The effects of punishment usually are specific to a particular context and behavior.* This means extra homework is not likely to keep Daniel in his seat when a substitute teacher arrives, because it was not that teacher who assigned the punishment. Also that punishment is not likely to deter Daniel from pulling Rebecca's hair, because the punishment was associated only with keeping him in his seat. Punishment rarely keeps someone from misbehaving beyond the specific context and behavior to which it was most closely associated.
- *The effects of punishment can have undesirable side effects.* If extra homework is truly aversive for Daniel, he may decide never to risk leaving his seat again, even to ask for your assistance or to use the restroom. Daniel may decide to take no chances about leaving his seat and not even to trust his own judgment about when an exception to the rule may be appropriate.
- *Punishment sometimes elicits a hostile or aggressive response.* Although any single punishment is unlikely to provoke a strong emotional response, keep in mind that students receive punishment in various forms all day long, both at school and at home. If your punishment is "the straw that breaks the camel's back," do not be surprised to observe an emotional outburst that is inconsistent with the degree of punishment rendered. When punishment is used, it should be used sparingly and in association with rewards.
- *The punishment can become associated with the punisher.* If you use punishment consistently as a tool for increasing the likelihood a desirable behavior will occur, you may lose the cooperation you need for managing your classroom effectively. With this cooperation gone, you will find the vital link for making management techniques work is gone as well. Plan not to solve every discipline problem by using punishment; otherwise the punishment could become more strongly associated with you than the desired behavior you wish to encourage.
- *Punishment that is rendered to stop an undesired behavior but is not immediately associated with the desired behavior seldom has a lasting effect.* If the desired behavior is not clear to your students at the time you administer the punishment, they will see the punishment only as an attempt to hurt, not as an attempt to encourage the desired behavior.

Warnings. A warning can prevent a minor problem from intensifying to the point that punishment is the only recourse. For the misbehaviors identified as mild in Table 6.2, it is not unusual to provide several warnings before dispensing some kind of consequence. However, after two or three warnings, you should assign some type of consequence, because waiting longer reinforces the student's belief that you are not serious about the misbehavior. This undermines the integrity of the rule being violated and your credibility.

Corporal Punishment. Absent from the common responses to misbehavor listed in Table 6.2 is any form of corporal punishment, such as paddling a student. Such punishment, although permissible in some school districts when administered by a specifically designated school authority, generally has not proven effective in deterring misbehavior.

One reason for this is that the heightened emotion and anxiety on the part of the student (and the administrator) at the time of the punishment often prevent rational discussion of the appropriate behavior the punishment is supposed to encourage. In addition, corporal punishment easily can provoke aggression and cause hostility in both students and parents. This can outweigh any immediate benefit that might accrue from the punishment.

Generally, you should avoid physical contact with a student, because such contact is easily misunderstood. This applies whether the contact is to administer punishment or, in the case of an older student, is a reward (patting a student on the shoulder for doing a good job) or form of assistance (placing your arm around a student in times of high anxiety). Although your own judgment, the situation, and the age of the student will be your best guides, the only clear exception is a situation requiring your immediate assistance. Examples of such situations are curtailing the movement of a student who is hurting another or restraining a student from self-injury. At such times, call an administrator as quickly as possible.

THE PARENT–TEACHER CONFERENCE

When a major infraction of a school or classroom rule has occurred or the motivation to learn is seriously lacking, the most effective form of response is the parent–teacher conference. It provides you the opportunity to inform one or both parents of the severity of the problem and to elicit their help in preventing it. Without the support of the student's family in providing the appropriate response at home, there is little chance that an intervention at school will have a lasting effect in correcting the problem and deterring its occurrence at another time (Lawrence-Lightfoot, 2003). Being grounded for a week, having to be in at a certain time, completing extra study time in the quiet of one's bedroom, or performing extra chores around the house will always have more impact than any aversive that can be administered during the school day, as long as it is administered with a clear understanding of the desired classroom behavior.

Notifying parents that a conference is desired usually is your responsibility, if the request for a conference is the result of a specific problem in your classroom. This notification should consist of a call or letter expressing to the parent(s) or guardian the following:

1. The purpose of the conference, including a statement of the joint goal of supporting the student's success in school
2. A statement or comment pointing out the integral role of the parent(s) or guardian in the discipline management process (this may include a citation from the state or school policy regarding such matters)
3. Possible dates, times, and location of the conference
4. A contact person and phone number, if the parent is unable to reach you directly (if you request a conference with the student's parents by phone, be sure to ask them to record the date, time, location, and contact person for the conference at the time of the call)

Whether conducting a conference by phone (which sometimes may be the only alternative) or in person, do the following during the conference:

- Try to gain the parents' acknowledgment of the problem and participation in the behavior management process.
- Present a plan of action for addressing the problem at home and at school.
- Identify follow-up activities (for example, sending a note home each week indicating progress, calling immediately if the problem should recur, reviewing the situation at the next parent–teacher night).
- Document what took place during the call or conference for future reference, including both matters of agreement and disagreement.

Conducting the Parent Conference

During the parent conference, you will be expected to talk plainly, listen, and use "I" messages that get across to parents your feelings.

Plain Talk. New teachers, particularly when they first meet parents or address them at group meetings, rely on familiar jargon—terms such as *norms, developmental needs, heterogeneous grouping, cognitive skills, higher-order thinking*—which may mean little to some parents. Jargon, however familiar to you, will diminish rather than increase your credibility with parents.

Listen. Listening is your most important communication skill. Parents, particularly when they are upset, want to be heard. One of the most frequent complaints leveled by parents against teachers is that they do not listen. The Appalachian Educational Laboratory (Shalaway, 1999) offers the following list of hints for you to become a good listener:

1. Maintain eye contact. Face the parent and lean forward slightly.
2. Nod and give other noninterrupting acknowledgments. Show the parent that you are listening.
3. When the parent pauses, allow him or her to continue without interrupting. Wait to add your comments until the speaker has finished.
4. Ignore distractions, such as others seeking your attention during the conference.
5. Check your understanding by summarizing the essential aspects of what the parent seemed to say or the feeling he or she seemed to convey.
6. Ask for clarification when necessary.

Suggestions 3, 5, and 6 are equally important when you are contacting a parent by phone.

The final skill requires active listening. It is particularly valuable during *reactive* parent conferences, or conferences requested by parents who are upset over something they perceive you said or did. Such conferences can be emotionally charged. Teachers typically take a defensive or aggressive posture when confronted by an angry parent. Rather than listen to what the parents have to say—regardless of how inaccurate it may seem—the teacher follows the parents' statement with a denial, a defensive statement, or a refusal to talk further.

Active listening is when the listener provides feedback to the speaker on the message heard and the emotion conveyed and thus opens the door to further communication by letting the speaker know he or she was being understood and respected. Active listening is an essential communication skill to be used with the parents of learners and learners themselves. It requires the ability to concentrate on what someone is saying even when you strongly object to what is being said. Like any skill, it must be practiced before you can use it naturally and automatically.

Use "I" Messages to Express Your Feelings. Particularly when you are upset about the words or actions of a learner or parent, you must be able to clearly communicate your feelings. However, the way to do this is not by criticizing or blaming (with a "you" message) but rather by describing (1) what you find offensive, (2) the feeling or emotion you experience when the offensive condition occurs, and (3) a statement of the reason for the feeling. Consider, for example, this statement: "When Amanda talks back to me, her behavior disrupts the entire class, and that makes me angry because I have to take time away from all the other students in the class to deal with her." This message is right on target. It focuses on the reaction to the problem, rather than what the child said or did. It opens up positive avenues to further communication.

Evaluating the Parent Conference

Following the conference, summarize what was said and agreed on, and make a list of any actions to be taken by you or the parent. Make follow-up calls, send notes, and follow through on whatever you committed to. Finally, take a moment to reflect on how well you communicated with the parents and achieved your goals and what you might change or do differently the next time you have a parent conference. This moment of reflection will be one of the most important aids to sharpening your parent-conferencing skills. See In Practice: Focus on Getting Parents Involved.

THE INFLUENCE OF HOME AND FAMILY ON CLASSROOM BEHAVIOR

Finally, it is important to note that some of the discipline problems you will face in your classroom have their origin in students' homes. Living in a fast-paced, upwardly mobile society has created family stresses and strains that our grandparents could not have imagined. Their lives while growing up were not necessarily any easier than yours or your students' lives, but they were most assuredly different, particularly in the intensity and rapidity with which children experience developmental stages and life cycle changes.

For example, by some estimates, boys and girls are maturing earlier than they did 50 years ago. This means they come under the influence of the intense emotions of sex, aggression, love, affiliation, jealousy, and competitiveness far earlier than their own parents may have. Teachers in the elementary grades are no longer surprised by the depth of understanding and ability of young students to emulate the media's attractively packaged images of adult behavior and lifestyles, especially as they relate to clothes, relationships, and dominance.

Although not often recognized, these generational differences sometimes are even more difficult for parents to accept than for you, the teacher. This often leads to major conflicts at home that surface in the classroom as seemingly minor but persistent misbehaviors. You can have little influence over home conflicts, except to understand they originate in the home and not in your classroom. In other words, there may be times when no amount of reward will seem to work, because the source of the problem is within the home and may be far more serious than you suppose—including marital discord, verbal or physical abuse, competition among siblings, financial distress, and divorce. One or more of these family disturbances will be occurring in the families of some of your students.

These are not trivial burdens for students, especially when combined with the social and academic demands of school, the uncertainties of a future job or education, and the developmental crises that school-age children feel between youth and adulthood (Erikson, 1968). If a problem persists and your efforts to resolve it are to no avail, consider the possibility that it may be rooted in the family. Although there is no easy way to know what is happening in the lives of your students at home, many students welcome the opportunity to reveal the nature of their problems, when asked. For some, it will be just the opportunity they have sought to shed some of the emotional burden these events are creating in their lives.

It is not your role to resolve such problems, but knowing the reason they are occurring may explain why your solutions to a behavioral problem may not be working. Knowing the reason also can help you decide whether to communicate with other professionals who are in a position to help, such as a social worker, school nurse, special education teacher, counselor, or school psychologist. Your communication and collaboration with these professionals could be invaluable in assisting you with classroom management problems that may have their origins with other individuals and in other contexts.

IN PRACTICE

FOCUS ON GETTING PARENTS INVOLVED

Active parent involvement has been associated with numerous benefits for students, including increasing student motivation and engagement in school. When it comes to homework, though, parent involvement can take many different shapes, not all of which have a positive impact on learning. When working to increase student engagement and motivation, it is important to include parents and discuss ways they can support their children's learning both at school and at home.

First, it is important that parents understand what role teachers expect them to play, especially in terms of homework. What one parent views as helping out, a teacher might perceive as interference or cheating. And what a teacher might take for granted that parents can do—such as signing off on homework or checking spelling words—a parent may not have the skills or the time to follow through on. Clearly, it is important to communicate with parents about how to best help children learn. It is also necessary for educators to be sure their expectations are realistic, given parents' skills and schedules.

It is equally important to be clear with parents about what kinds of involvement are actually beneficial to students. Studies have shown that parents who offer rewards for grades, or who punish students for poor performance, may actually decrease students' motivation to do well. Fear of punishment, anxiety about meeting parents' expectations, and worrying about being compared to siblings not only cause stress for students, but can also detract from their intrinsic motivation and interest in learning. This is not to say that parents shouldn't be invested in how their children are doing in school. Rather, it suggests that there are more productive ways for them to be involved and show their interest in students' progress.

To help children be successful with work at home and at school, parents can (Paulu, 1998):

- *Create a place at home that is conducive to studying.* Good study environments are well lit and quiet. Although every child's learning style is different, most educators agree that students do best when the television is off and the student is free from distractions.
- *Set aside a specific time for homework each day.* This might involve limiting television-watching or phone calls until homework is finished. Parents should be careful, though, not to pit homework against activities students enjoy, or to create situations in which students rush through their work in order to get back to other activities. Paulu (1998) notes that family routines—which include set homework times—have been linked to higher student achievement.
- *Make sure students have all the supplies they need.* Parents should check in with students ahead of time about the kinds of projects they will be doing: It might be tough to find a calculator or a report cover at 9:00 the night before an assignment is due.
- *Be available if students have questions.* Parents can support their children by looking over homework and giving suggestions, but should not do the homework for them.
- *Make an effort to communicate regularly with teachers.* If necessary, parents should ask teachers to clarify their expectations. It is also a good idea to find out ahead of time what kinds of resources—such as tutors or services for second-language students—are available to students if they need help.
- *Avoid linking rewards or punishment to school performance.* While it is important for parents to recognize students' achievements, they should avoid external motivators for performance. Instead, parents should emphasize the value of learning and show they appreciate their child's hard work.

These expectations can be sent home to parents at the beginning of school and made available at Parent-Teacher night.

Source: From "Increasing Student Engagement and Motivation: From Time-on-Task to Homework," by Cori Brewster and Jennifer Fager, October 2000, Northwest Regional Educational Laboratory (www.nwrel.org/request/oct00/textonly.html# involve). Reprinted by permission. For more about parent involvement, see *Parent Partners: Using Parents to Enhance Education,* at www.nwrel.org/request/march99/index.html.

Video Window

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The Parent–Teacher Conference

In this video, you will listen in on two parent–teacher conferences in which the parents are confronted with a problem with their child. You will watch how two teachers deal with both cooperative and uncooperative parents and how, with the proper approach, they turn the uncooperative parents in a constructive and cooperative direction for resolving their child's problem. Specifically, you will see how to listen to parents so you can hear their concerns, cite specific instances of the problem their child is having, avoid jargon and technical language that can confuse and distance parents, remain nonjudgmental, and, finally, seek to empower parents to become active participants working with you. Identify and describe instances of how these teachers do the following:

- Gain the parents' acknowledgment of the problem and their participation in the management process.
- Present a plan of action for addressing the problem at home and at school.
- Identify follow-up activities for remediating the problem.
- Document what takes place at the conference, including agreements and disagreements.

Go to the Assignments and Activities section of Topic 15: "Collaborating with Colleagues and Families" in the MyEducationLab for your course and complete the activity "The Parent–Teacher Conference."

CULTURALLY RESPONSIVE CLASSROOM MANAGEMENT II

One of the most encouraging advances in the understanding of classroom management is the emerging field of **culturally responsive teaching.** As we saw in previous chapters, the writings and research of Bowers and Flinders (1991), Delpit and colleagues (2003), Delpit and Dowdy (2008), Gay (2000), Tharp (1997), and Tharp and Gallimore (1991) present convincing arguments that different cultures react differently to nonverbal and verbal behavior management techniques, including proximity control, eye contact, warnings, and classroom arrangement. Furthermore, these researchers cite numerous examples of how teachers of different cultures interpret the disruptive behaviors of children differently. Therefore, be aware that many of the behavioral management techniques presented in this and Chapter 5 may be culturally sensitive and that an effective classroom manager matches the technique he or she uses not only with the situation but also with the cultural history of the learner.

If the research supporting culturally responsive teaching has yet to provide explicit prescriptions for teaching culturally different learners, what does it tell us about better understanding students in multicultural classrooms? The traditional method of conducting classroom research is to study large groups of teachers, classify their teaching methods, give learners achievement tests, and try to find relationships between achievement test scores and particular teaching practices. Dillon (1989), however, used a different approach. She studied one teacher, Mr. Appleby, and his class for a year using a research method called *microethnography.* Her study has provided valuable insights into what a teacher can do to create a classroom where culturally different learners experience academic and personal success.

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Go to Topic 4: "Motivation" in the MyEducationLab for your course, where you can apply and practice your understanding of the core teaching skills identified in the chapter with a Building Teaching Skills and Dispositions learning unit.

Dillon concluded that Appleby's effectiveness as a classroom teacher was due to his ability to assume the role of "translator and intercultural broker" between the middle-class white culture of the school and the lower-class African American culture of his students. As a cultural broker and translator, Appleby was thoroughly knowledgeable about the backgrounds of his learners, and as a result, he was able to bridge the differences between the school and community/home cultures. He had acquired a high degree of what Lustig and Koester (2009) call **intercultural competence** (DeMeulenaere, 2001). With this cultural knowledge, Appleby created a classroom with three significant attributes:

1. He created a social organization in which the teacher and learners knew one another, trusted one another, and felt free to express their opinions and feelings.
2. He taught lessons built on the prior knowledge and experiences of his learners. Because of his knowledge of the learners' backgrounds, he was familiar with their knowledge, skills, and attitudes toward the content. This knowledge allowed him to represent the subject matter in ways that encouraged students to link it with what they already knew and felt.
3. He used instructional methods that allowed learners to actively participate in lessons, to use the language and sociolinguistic patterns of their culture, and to use the language and social interaction patterns both he and his learners were familiar with.

Antón-Oldenburg (2000), Delpit and Dowdy (2008), H. M. Miller (2000), and Lustig and Koester (2009) conclude that what teachers need to know to teach successfully in multicultural classrooms has more to do with knowing the values, socialization practices, interests, and concerns of their learners than with knowing about presumed learning style preferences and cognitive styles and the do's and don'ts of teaching learners with these traits. Rather, researchers believe the cultural knowledge that teachers such as Appleby have about their learners allows them to represent subject-matter content in ways that are meaningful to students, to develop lessons that gain students' active participation, and to create social organizations in the classroom within which learners feel free to be themselves.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 6 content. After reading the case history, go to Chapter 6 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Mr. Scott's tenth-grade English class has just finished a unit on Shakespeare's *Julius Caesar.* Today he wants to have a discussion that will crystallize some of the key concepts from the play. He also hopes having a fruitful discussion will help prepare the class for the upcoming test over this material. In the past, unfortunately, discussions have been marred by many disruptions, such as students talking out of turn, interrupting one another, and making a flurry of requests for hall passes to the bathroom because "We're not doing anything for a grade right now."

Today Mr. Scott introduces the concept of a *graded discussion.* So he can keep the discussion focused, he has selected Susan to record students' contributions. Susan is an A student, but she tends to dominate classroom exchanges, and students sometimes wait to hear her ideas rather than volunteer their own. Some even get resentful and refuse to answer at all. Susan will be guaranteed a 110, the highest grade, for her task of recording the contributions, but she will not be able to contribute to the discussion. The next recorder will be selected from those students who get the maximum score in today's discussion.

Susan will sit in the front of the classroom with a copy of the seating chart and make a checkmark for every comment each student makes. For the comment to be counted, the student must raise his or her hand and be acknowledged by Mr. Scott before talking. For certain responses, such as ideas that build on the comments of other students and answers to particularly hard questions, the student may receive two checkmarks. Every checkmark counts as 5 points.

Every student who arrives in class promptly will begin with a base score of 70. Those who are late will begin with a 10-point deduction from that base score, or 60 points. The maximum score is 110 and will count as one section of the unit test.

Mr. Scott tosses out the initial question: "Many scholars accept that the protagonist of the play is the title character, Julius Caesar, but others suggest it is really Brutus, who dominates and wrestles with the moral dilemmas that charge the action of the play. What do you think? Be sure to give reasons for your opinions."

Everyone looks to Susan, whose opinion must be the right one, and she squirms in her seat with obvious frustration. After a short pause, wherein all the students realize they cannot depend on her, Jeremy raises his hand and says, "Now that I think of it, I think the second guys are right. It's really Brutus we care about. When Caesar was killed, I didn't feel that bad. He almost deserved it the way he was acting, like he was high and mighty, but I really felt bad when Brutus killed himself."

Mr. Scott checks to see that Susan has recorded a checkmark for Jeremy and points to Juanita. Then Juanita says, "I don't know if you have to feel bad when someone dies for them to be the main character in a play, but you said something that got me thinking, Jeremy. Caesar dies in the third act. We have almost half the play without him, but Brutus sticks in there until the end."

"Juanita, you were really a good listener and built on Jeremy's idea. Make sure she gets two checkmarks for her comments, Susan."

Mack, who has been hurriedly arranging his notebook and books after his late arrival to class, raises his hand. "Sure, Caesar dies in Act III, but don't forget his ghost in Act IV. And Brutus even mentions Caesar's name when he kills himself—'I killed not thee with half so good a will' or something like that. So I think Caesar is there in spirit throughout the whole play."

"Well, Mack," Mr. Scott replies, "your response not only built on Juanita's idea, but you even paraphrased an actual quote from the play. You have now recovered from the 10-point deduction for being late."

Andrea bursts in with a question: "What about Antony, Mr. Scott?"

Before she can continue, Mr. Scott puts his hands up to his ear, pretending not to hear. "I can't hear anyone who doesn't raise their hand."

Andrea raises her hand and waits for Mr. Scott to nod before she continues. "'Friends, Romans, Countrymen, I come to bury Caesar, not to praise him . . .' I mean, that is the coolest speech ever. He had the whole audience in the palm of his hand. That was really a climactic moment in the whole play."

"So now we have three candidates for protagonist: Caesar, Brutus, and Antony. Any opinions on that newest idea?"

A wave of hands goes up. No one is waiting for cues from Susan now.

SUMMING UP

The main points in this chapter include the following:

The Humanist Tradition in Classroom Management

1. Most classroom discipline problems are low intensity, continuous, and unconnected with any larger, more serious events.
2. The humanist tradition of classroom management focuses on the inner thoughts, feelings, psychological needs, and emotions of the individual learner. Humanist approaches emphasize the importance of allowing the student to control his or her own behavior.

3. Ginott's sane messages communicate to students that their behavior is unacceptable but do so in a manner that does not blame, scold, or humiliate.
4. Glasser's and the Joneses' cooperative learning emphasizes building a more friendly classroom that the learner will regret leaving because of misbehavior, if told to do so.
5. The humanist tradition focuses on developing rules, getting support from school administrators, holding private conferences with students, and following through when students must be removed from the classroom.

The Applied Behavior Analysis Tradition in Classroom Management

6. The applied behavior analysis tradition of classroom management applies the techniques of operant conditioning to change socially important behaviors.
7. Behavior modification focuses on changing or modifying behavior by following a behavior with some type of reinforcement.
8. Positive reinforcement occurs when a desired stimuli or reward is provided after a desired behavior to increase its frequency.
9. Negative reinforcement occurs when a painful, uncomfortable, or aversive state is avoided to achieve a more desirable state.
10. Antecedents are events or stimuli present when you perform a behavior that elicits or sets off the behavior, such as sounds, sights, and people.
11. The tradition of applied behavior analysis focuses on identifying appropriate and inappropriate behaviors, antecedents that can trigger these behaviors, the student's goal for the misbehavior, and procedures for reinforcing the appropriate behavior.

The Classroom Management Tradition

12. The classroom management tradition frames the question of classroom order and discipline not in terms of reaction but prevention.
13. The classroom management tradition focuses on planning and organizing the classroom, teaching rules and routines, and informing students of the consequences of breaking the rules.

An Integrated Approach to Classroom Management

14. The term *low-profile classroom control* refers to coping strategies used by effective teachers to stop misbehavior without disrupting the flow of a lesson.
15. Three ways to apply your authority in dealing with misbehavior are as follow:
    - You alone judge what occurred and what the punishment should be.
    - You provide alternative forms of punishment from which the student must choose.
    - You select a punishment from alternatives that the student provides.
16. The level of severity with which you respond to a misbehavior should match the misbehavior that has occurred.
17. The idea behind reinforcement theory is that any behavior can be controlled by the consequences that immediately follow it. When the consequences change the probability of the behavior's recurrence, reinforcement has occurred.
18. Some misbehaviors that occur in classrooms are increased unintentionally through reinforcement. In such a case, the probability of the misbehavior increases because the consequence that follows the misbehavior is perceived as desirable by the student.
19. Both reward and punishment can increase the probability of a behavior, although punishment without reward is rarely effective.
20. Punishment in the absence of reward tends to be less effective in increasing the probability of a desired behavior for the following reasons:
    - Punishment does not guarantee the desirable response will occur.
    - The effects of punishment usually are specific to a particular context.
    - The effects of punishment can have undesirable side effects.
    - Punishment can create a hostile or aggressive response.
    - The punishment can become associated with the punisher.
21. After two or three warnings have been given in response to a misbehavior, a punishment should be assigned.
22. Corporal punishment is rarely effective in deterring misbehavior.

The Parent–Teacher Conference

23. One feature of the parent–teacher conferences that accounts for its effectiveness is the involvement of the parents in eliminating the misbehavior.
24. During the parent conference, you should talk plainly, listen, and use "I" messages.

Culturally Responsive Classroom Management II

25. Culturally responsive teaching represents the teacher's ability to react to different cultures with different verbal and nonverbal classroom management techniques.
26. *Intercultural competence* refers to the teacher's ability to act as a translator and intercultural broker among students of different cultures, ethnicities, and social classes.

KEY TERMS

Active listening, 209
Applied behavior analysis, 192
Behavioral antecedents, 196
Behavior modification, 195
Classroom management tradition, 192
Congruent communication, 193
Cooperative learning, 194
Culturally responsive teaching, 212
Humanist tradition, 192
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Intermittent reinforcement, 196
Low-profile classroom management, 199
Natural reinforcers, 205
Negative reinforcement, 195
Operant conditioning, 206
Positive reinforcement, 195
Surface behaviors, 200

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. Identify the six criteria of an effective classroom management plan. Which, in your opinion, will be the easiest to achieve in your classroom, and which will be the most difficult? Why?
*2. What specific things would Glasser have you do as you begin to manage your classroom? Which do you feel is (are) the most important? Why?
*3. How might you use both positive and negative reinforcement to stop a student from repeatedly talking? Use an example of each to support your point.
*4. Describe time-out and response cost. Give an example of a situation in which you would use each.
*5. According to research studies of classroom management, what three broad classes of preventive teaching behaviors are used by effective classroom managers? List the three in order of least to most difficult to implement at your grade level.
*6. How can you use your authority to assign consequences for misbehaving? Which approach would you feel most comfortable using? Why?
7. For the following misbehaviors, identify a consequence that reflects the severity of the offense. Do not use the same response more than once.
   - Talking back
   - Cutting class
   - Eating in class
   - Jumping out of seat
   - Sleeping in class
   - Obscene gesturing
   - Using drugs
   - Fighting
8. What reward would you provide to get a student to do each of the following?
   - Homework
   - Stop talking back
   - Turn in assignments on time
   - Be on time for class
   - Remember pencil
   - Not talk without raising hand

*9. What steps would you follow to transfer the control from an extrinsic reinforcer to that of a natural reinforcer? Identify a reinforcer at your grade for which you might follow these steps.
*10. Identify five reasons punishment is rarely effective in the absence of reward. Looking back at your own school days, which seems the most true for you?
*11. What two objectives for having a parent–teacher conference are discussed in this chapter? What might be some other objectives?

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B.

*1. From your classroom observation and fieldwork, recall an example of what Ginott calls *sane messages.* To what extent do you think this technique was effective?

2. Using an example of teacher dialogue, provide an "I" message to communicate your disappointment to a student.
3. Give an example of a low-profile anticipation–deflection–reaction sequence that you have observed.
*4. Using a specific example from your classroom observation, identify under what conditions a punishment is or is not effective.
5. From your field experience, describe a scenario of how a teacher responded in a culturally responsive manner to a student who did poorly on an assignment. What might be a culturally unresponsive reply in this situation?

Digital Portfolio Activities

The following digital portfolio activities relate to INTASC principles 9 and 10.

1. Imagine having to conduct a parent–teacher conference concerning a student's failure to complete assignments on time. Prepare some "talking points" in an outline format that you want to be sure to bring up during the conference. Your talking points should include the following:
   - What you will do to gain the parents' acknowledgment of the problem
   - A plan of action for addressing the problem at home and at school
   - Follow-up activities that will monitor that progress is being made
   - A summary or restatement of the agreements made between you and the parents

   Place your talking points in the "Classroom Management" folder of your digital portfolio as a reminder of key issues to discuss during a parent–teacher conference.
2. In Field Experience Activity 5, you described a scenario of how a teacher responded in a culturally responsive manner to a student who did poorly on an assignment. Place this scenario in the "Classroom Management" folder of your digital portfolio as a reminder of a reply that is culturally responsive.

Classroom Observation Activities

The following classroom observation activities relate to INTASC principle 5. To record your Classroom Observations, go to Chapter 6 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activities 6.1 and 6.2.

1. Use Observation Activity 6.1, Observing Low-Profile Classroom Control, to record each occurrence you observe of anticipation, nonverbal and verbal deflection, and reaction techniques in a classroom. Write down any other responses that you believe represent low-profile classroom control. Add up how many times you observed each example. Which was used most often? Which was used least often or not at all? Place this observation record in the "Classroom Management" folder of your digital portfolio for future use.
2. Use Activity 6.2, Checklist for Observing Dimensions of Classroom Management, to record whether a classroom arrangement matches the instructional goals of the teacher, has preestablished classroom rules, exhibits use of instructional routines, uses incentives to promote appropriate behavior, and uses low-profile classroom management. At the end of your observation, add a brief description to each box, highlighting at least one specific reason you placed each checkmark as you did. Place the checklist into the "Classroom Management" folder of your digital portfolio for future use in observing classroom management.

7

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. What is the direct instruction model?
2. How do I organize lesson content for direct instruction?
3. How can I encourage my learners to actively respond during direct instruction?
4. What media and technology can I use with direct instruction?
5. What are some ways of promoting the goals of direct instruction in a heterogeneous classroom?

INTASC

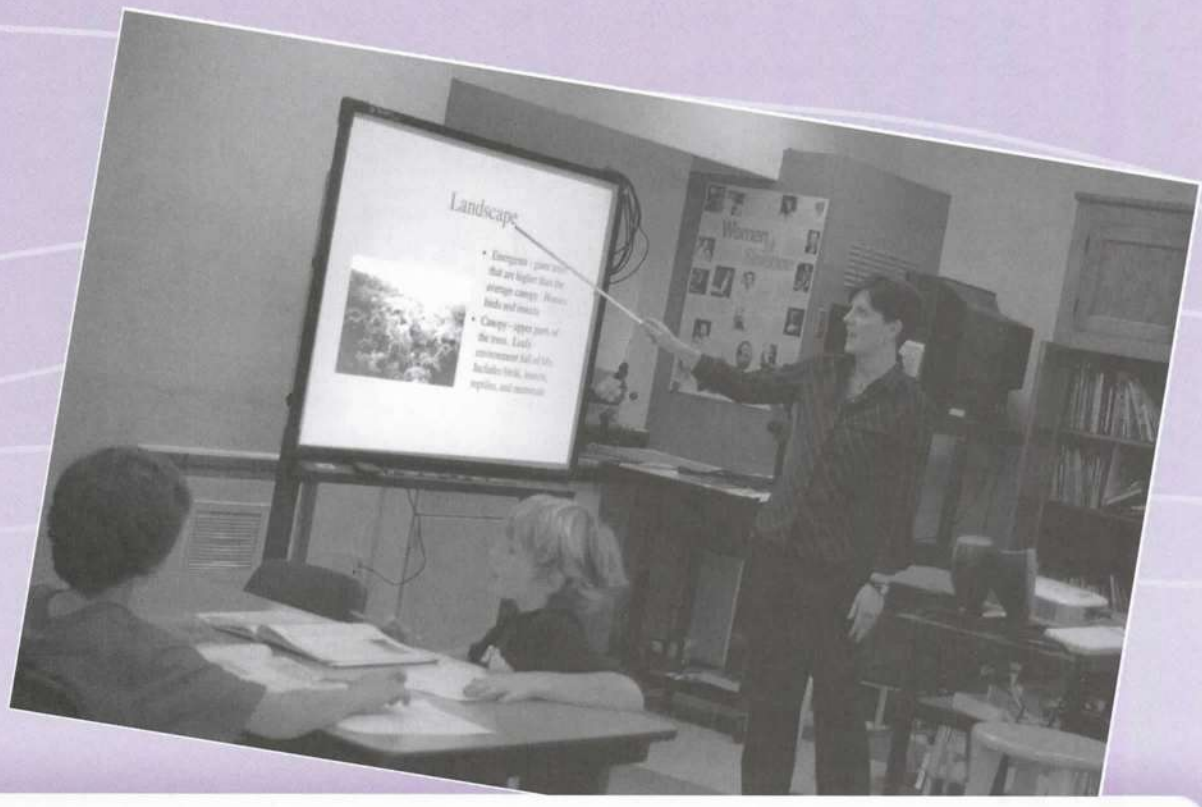
principle 1 The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students.

principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.

principle 4 The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.

principle 5 The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.

Teaching Strategies for Direct Instruction



The chapter on lesson planning (Chapter 4) presented seven instructional events that form the structure of a lesson plan:

1. *Gaining attention*
2. *Informing the learner of the objective*
3. *Stimulating recall of prerequisite learning*
4. *Presenting the stimulus material*
5. *Eliciting the desired behavior*
6. *Providing feedback*
7. *Assessing the behavior*

This and subsequent chapters will present different instructional strategies by which these seven events can be implemented. This chapter presents strategies for direct teaching that include explanation, example, review, practice, and feedback in the context of a presentation and recitation format.

Have you ever wondered why some teachers are more liked than others? Students cannot wait to attend the classes of some teachers but dread attending the classes of others. Teachers who are more liked often are described with phrases such as "is more organized," "has a better personality," and "is warmer and friendlier." Although these qualities may be present in teachers judged to be among the most liked, they are not the only reasons that some teachers are more interesting than others to their learners.

One of the most important factors in how interesting teachers are to their students is their use of one key behavior: instructional variety. *In a study of experienced and inexperienced teachers (Emmer et al., 1980; Emmer & Evertson, 2009; Evertson & Emmer, 2009), experienced teachers who showed flexibility and variety in their instructional strategies were found to be more interesting than inexperienced teachers, who had no knowledge of alternative teaching strategies.*

Knowledge of a variety of instructional strategies and the flexibility to change them both within and among lessons are two of the greatest assets a teacher can have. It is unlikely that any other key behavior, however well executed, will have the same effect as variety and flexibility in capturing the interest and attention of your students. This chapter provides a variety of teaching strategies you can use to compose lesson plans and to create and maintain an atmosphere of interest and variety in your classroom using a direct instruction format.

CATEGORIES OF TEACHING AND LEARNING

Just as the carpenter, electrician, and plumber must select the proper tool for a specific task, you must select the proper instructional strategy for a specific learning outcome. To help determine your choice of strategies, here are two broad classifications of learning outcomes:

Type 1: Facts, rules, and action sequences
Type 2: Concepts, patterns, and abstractions

Type 1 outcomes often represent behaviors at lower levels of complexity in the cognitive, affective, and psychomotor domains. These include the knowledge, comprehension, and application levels of the cognitive domain; the awareness, responding, and valuing levels of the affective domain; and the imitation, manipulation, and precision levels of the psychomotor domain.

Type 2 outcomes represent behaviors at the higher levels of complexity in these domains. They include outcomes at the analysis, synthesis, and evaluation levels of the cognitive domain; the organization and characterization levels of the affective domain; and the articulation and naturalization levels of the psychomotor domain. Examples of Type 1 and Type 2 outcomes are shown in Tables 7.1 and 7.2.

Some important differences between instructional goals requiring these two types of learning are shown in Table 7.3.

In comparing the two columns of Table 7.3, notice that these two types of learning are being required. In the left column, Type 1 tasks require combining facts and rules at

Table 7.1 Example of Type 1 Outcomes: Facts, Rules, and Action Sequences

Facts	Rules	Action Sequences
1. Recognize multiplication with two-digit numbers	Carrying with two-digit numbers	Multiplying to 1,000
2. Identify apostrophe *s*	Finding words with apostrophe *s*	Using apostrophe *s* in a sentence
3. Select multisyllable words from a list	Pronouncing multisyllable words	Reading stories with multisyllable words
4. State the chemical composition of water	Combining 2 parts hydrogen with 1 part oxygen	Writing the expression for water

Table 7.2 Example of Type 2 Outcomes: Concepts, Patterns, and Abstractions

Concepts	Patterns	Abstractions
1. Positive and negative numbers	$-3\ (-4)\ 11 =$ $10 \times (-6) =$	Signed numbers
2. Possessive form	Police officer's daughter; Mrs. Burns's paper	Ownership
3. Vowels (v) and consonants (c)	cv order; cvc order	Vowel/consonant blends
4. Element, atomic weight, and valence	H_2O	Molecular structure

Table 7.3 Instructional Objectives Requiring Type 1 and Type 2 Outcomes

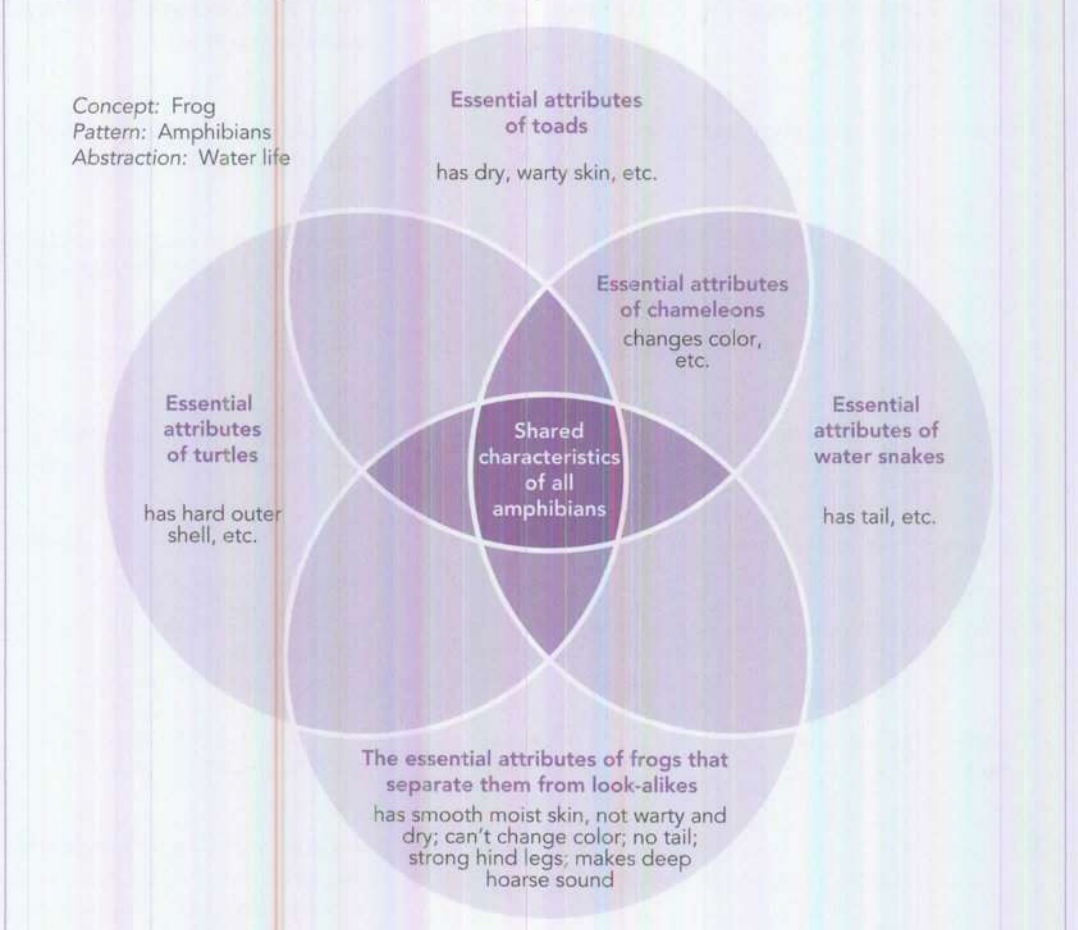
Type 1: Objectives Requiring Facts, Rules, and Action Sequences	Type 2: Objectives Requiring Concepts, Patterns, and Abstractions
1. IF	BUT IF
The objective is to *recognize* multiplication to 1,000	The objective is to *understand* multiplication of signed numbers
THEN TEACH	THEN TEACH
the multiplication tables and have the student *find examples.*	the concept of negative and positive numbers and *show how they are multiplied.*
2. IF	BUT IF
The objective is to *identify* the apostrophe *s*	The objective is to *express* ownership
THEN TEACH	THEN TEACH
words using the apostrophe *s*, and have the student *find words denoting possession.*	the concept of the possessive form and have the student *practice writing paragraphs* showing forms of possession.
3. IF	BUT IF
The objective is to *select* multisyllable words	The objective is to *pronounce* vowel/consonant blends
THEN TEACH	THEN TEACH
how to *find each word* on a list, and have the student write the words.	vowels and consonants and have the student *read the story aloud.*
4. IF	BUT IF
The objective is to *state* the chemical composition of water	The objective is to *determine* the molecular structure of chemical substances
THEN TEACH	THEN TEACH
the symbol for 2 parts hydrogen and 1 part oxygen, and have the student *write the chemical composition of water.*	the concepts of element, atomic weight, and valence and have the student *practice balancing the atomic weights of chemical substances.*

the knowledge and comprehension levels into a sequence of actions that can be learned by observation, rote repetition, and practice. Students can learn the correct answers by memorizing and practicing behaviors you model. In the right column, Type 2 learning is called for. The correct answers are not so closely connected to facts, rules, or action sequences that can be memorized and practiced in some limited context. Something more is needed to help the learner go beyond the facts, rules, or sequences to create, synthesize, and ultimately identify and recognize an answer that cannot be easily modeled or memorized. The missing link involves learning a concept, pattern, or abstraction.

For example, to learn the concept of a *frog* involves learning the essential characteristics that make an animal a frog, as distinguished from similar animals (green chameleons). In other words, the learner needs to know not only the characteristics that all frogs have but also what characteristics distinguish frogs from other animals. If we classified frogs only on the characteristics of being green, having four legs, eating insects, and being amphibious, some turtles could be misidentified as frogs. Another category of knowledge must be learned that contains characteristics that separate frogs from similar animals (e.g., frogs have soft bodies, moist skin, and strong hind limbs, and they do not change color).

Figure 7.1 presents an advance organizer (see Chapter 8) showing the abundance of information involved in learning the concept of *frog*. Notice that to properly classify a frog among other animals that may look like frogs, both nonessential and essential frog attributes need to be learned. The nonessential attributes can be learned only by studying nonexamples, thus allowing learners to eliminate characteristics that are not unique to frogs. Finally, as learners gain more practice with both examples and nonexamples, the

Figure 7.1 Learning the Concept of *Frog*



concept of a *frog* emerges as a tightly woven combination of characteristics. Now learners are able to disregard superficial characteristics, such as color, and to focus on characteristics unique to frogs. Given pictures of various toads, chameleons, turtles, snakes, and so on, students learn to identify correctly those animals that are frogs.

At this point, the learner has discovered at least some of the essential attributes of a frog and has formed an initial concept. Notice how different this teaching/learning process is from simply having your learners repeat some recently memorized facts about frogs: "Frogs are green, have four legs, eat insects, and can swim." This response does not tell you whether learners have acquired the *concept* of a frog, a *pattern* of which frogs are a part (e.g., amphibian), or even the most general and *abstract* frog characteristics (e.g., water life). Even if students learn the considerably more complex task of how to care for frogs, they still have not learned the concept of a *frog*. They have only learned how to arrange a constellation of facts into the action sequence of caring for frogs.

The preceding demonstrates how the processes used to learn facts, rules, and action sequences are different from those used to learn concepts, patterns, and abstractions. And just as different cognitive processes are involved in learning these different outcomes, so are different instructional strategies needed to teach them.

Facts, rules, and action sequences are most commonly taught using instructional strategies that emphasize knowledge acquisition. Concepts, patterns, and abstractions are most commonly taught using strategies that emphasize inquiry or problem solving. These conclusions follow distinctions by cognitive psychologists such as J. R. Anderson (2004); Gagné, Yekovich, and Yekovich (1997); Huffman (2005); Mayer (2002); and Ormrod (2007b); whose writings have highlighted the different instructional strategies required by learning Types 1 and 2.

Knowledge acquisition and inquiry are different types of learning outcomes, so each must be linked with the specific strategies most likely to produce the desired outcome. This chapter presents a group of strategies for teaching knowledge acquisition involving facts, rules, and action sequences called **direct instruction.** The next chapter presents strategies for teaching inquiry and problem solving involving concepts, patterns, and abstractions called **indirect instruction.** In subsequent chapters, both types of learning are combined to show how together they can provide a menu of teaching strategies that help your learners solve problems, think critically, and work cooperatively.

Introduction to Direct Instruction Strategies

As we have seen, the teaching of facts, rules, and action sequences is most efficiently achieved through a process called the *direct instruction model.* Direct instruction is a teacher- or software-centered strategy in which you and/or the computer is the major information provider. In the direct instruction model, facts, rules, and action sequences are presented to students in the most direct way possible. At first, this usually takes a presentation and recitation format with explanations, examples, and opportunities for practice and feedback by the teacher. But a direct instruction presentation and recitation format employing verbal explanations and teacher–student interactions may also include software-driven questions, correction of student errors, and review and practice. Let's first look at some of the characteristics of effective direct instruction provided in a teacher presentation format.

A direct instruction presentation in the elementary and secondary classroom is not like the college lecture you may be familiar with. The typical college lecture rarely will be suitable for your classroom, because your learners' attention spans, interest levels, and motivation will not be the same as those of college students. Therefore, the lecture, as presented here, is neither a lengthy monologue nor an open, free-wheeling discussion. Instead it is a quickly paced, highly organized set of interchanges that you control, focusing exclusively on acquiring a limited set of predetermined facts, rules, or action sequences.

Angelillo (2008) and Rosenshine and Stevens (1986) have equated this type of instruction with that of an effective demonstration in which the following occurs:

1. You clearly present goals and main points.
   a. State goals or objectives of the presentation beforehand.
   b. Focus on one thought (point, direction) at a time.
   c. Avoid digressions.
   d. Avoid ambiguous phrases and pronouns.
2. You present content sequentially.
   a. Present material in small steps.
   b. Organize and present material so learners master one point before you go to the next point.
   c. Give explicit, step-by-step directions.
   d. Present an outline when the material is complex.
3. You are specific and concrete.
   a. Model the skill or process (when appropriate).
   b. Give detailed and redundant explanations for difficult points.
   c. Provide students with concrete and varied examples.
4. You check for students' understanding.
   a. Make sure that students understand one point before you proceed to the next.
   b. Ask students questions to monitor their comprehension of what has been presented.
   c. Have students summarize the main points in their own words.
   d. Reteach the parts that students have difficulty comprehending—either through further teaching or explanation or by students tutoring each other.

Table 7.4 provides examples of some of the action verbs that correspond to the objectives most suited for direct instruction. These outcomes are learned through application of facts, rules, and action sequences that usually can be taught in a single lesson. You can most easily and directly test them with multiple-choice, listing, matching, fill-in, and short-answer questions. Test items will call for the listing of memorized names, dates, and other facts; the summarizing or paraphrasing of learned facts, rules, or sequences; or the connection and application of learned facts, rules, and sequences in a context slightly different from the one in which they were learned.

Table 7.4 Action Verbs That Correspond to the Objectives Most Suited for Direct Instruction

Cognitive Objectives	Affective Objectives	Psychomotor Objectives
Recall	Listen	Repeat
Describe	Attend	Follow
List	Be aware	Place
Summarize	Comply	Perform accurately
Paraphrase	Follow	Perform independently
Distinguish	Obey	Perform proficiently
Use	Display	Perform with speed
Organize	Express	Perform with coordination
Demonstrate	Prefer	Perform with timing

Direct instruction has been referred to as "active teaching" (Angelillo, 2008; Good, 1979; Guillaume, Edwards, & Slowik, 2006; Rosenshine, 1971, 1986), which is characterized as follows:

- Full-class instruction (as opposed to small-group instruction)
- Organization of learning around questions you pose
- Provision of detailed and redundant practice
- Presenting material so learners master one new fact, rule, or sequence before the teacher presents the next
- Formal arrangement of the classroom to maximize recitation and practice

Figure 7.2 presents the teaching strategies most commonly associated with the direct instruction model. You can see that a large share of teaching time is devoted to direct instruction—that is, to providing information directly to students while interspersing explanations, examples, practice, and feedback.

Figure 7.2 Some Direct Instruction Strategies

1. Daily review, checking previous day's work, and reteaching (if necessary):
   - Checking homework
   - Reteaching areas where there were student errors
2. Presenting and structuring new content:
   - Provide overview
   - Proceed in small steps (if necessary), but at a rapid pace
   - If necessary, give detailed or redundant instructions and explanations
   - New skills are phased in while old skills are being measured
3. Guided student practice:
   - High frequency of questions and overt student practice (from teacher and materials)
   - *Prompts* are provided during initial learning (when appropriate)
   - All students have a chance to respond and receive feedback
   - Teacher *checks for understanding* by evaluating student responses
   - Continue practice until student responses are firm
   - Success rate of 80% or higher during initial learning
4. Feedback and correctives (and recycling of instruction, if necessary):
   - Feedback to students, particularly when they are correct but hesitant
   - Student errors provide feedback to the teacher that corrections and/or reteaching is necessary
   - Corrections by simplifying question, giving clues, explaining or reviewing steps, or reteaching last steps
   - When necessary, reteach using smaller steps
5. Independent practice so that student responses are firm and automatic:
   - Seatwork
   - Unitization and automaticity (practice to overlearning)
   - Need for procedure to ensure student engagement during seatwork (i.e., teacher or aide monitoring)
   - 95% correct or higher
6. Weekly and monthly reviews:
   - Reteaching, if necessary

Source: From "Teaching Functions in Instructional Programs," by B. Rosenshine, 1983, *Elementary School Journal, 83*, p. 338. Reprinted by permission of the University of Chicago. Copyright © 1986 by the University of Chicago. All rights reserved.

Whether explaining, pointing out relationships, giving examples, or correcting errors, using strategies that follow the direct instruction model has many advantages. Research indicates that direct instruction strategies are among those that correlate highest with student achievement, as measured by standardized tests, which tend to emphasize facts, rules, and sequences (Anderson, Evertson, & Brophy, 1982; Marzano, Pickering, & Pollock, 2004; Rosenshine, 1986, 1995; Walberg, 1991).

WHEN IS DIRECT INSTRUCTION APPROPRIATE?

When direct instruction strategies are used for the proper purpose, with the appropriate content, and at the right time, they will be important offerings on your teaching strategy menu. Most direct instruction strategies are at their best when your purpose is to disseminate information not readily available from software, texts, or workbooks in appropriately sized pieces. If such information were available, your students might well learn the material from these sources independently, with only introductory or structuring comments provided by you. However, when you must partition, subdivide, or translate textbook and workbook material into a more digestible form before it can be practiced in a computer or workbook format, direct instruction is appropriate.

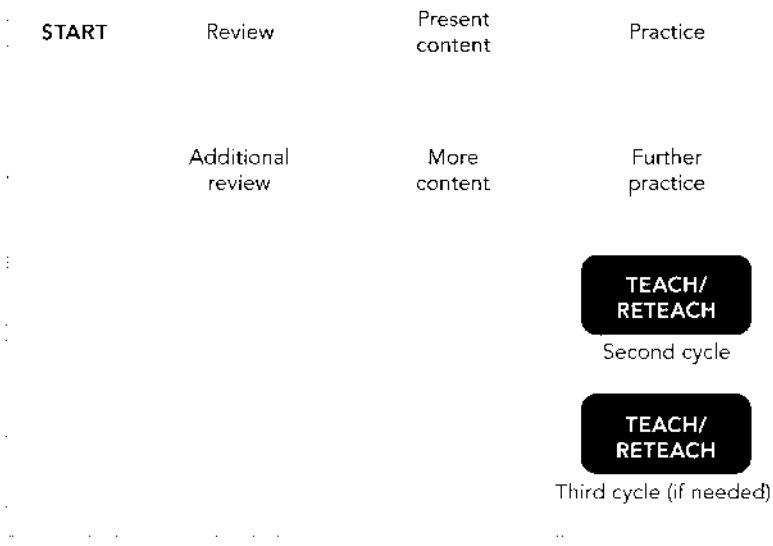
Another time to use direct instruction strategies is when you wish to arouse or heighten student interest. Students often fail to complete software, textbook, and workbook reading and exercises in the mistaken belief that the material is boring, is not worth their effort, or presents content already learned. Your active participation in the presentation of content can change these misperceptions by mixing interesting supplemental or introductory information with the dry facts, by showing the application of the material to future schoolwork or world events, and by illustrating with questions and answers that the material is neither easy nor previously mastered. Your direct involvement in presenting content provides the human element that may be necessary for learning to occur in many of your students.

Finally, direct instruction strategies are indispensable for achieving content mastery and overlearning of fundamental facts, rules, and action sequences that may be essential to subsequent learning and remembering what was learned long afterwards (Gentile & Lalley, 2003; Gronlund, 2006; Lindsley, 1992). The degree of **mastery learning** that occurs is directly related to the time a student is actively engaged in the learning process. The more time spent reviewing and practicing, the greater the retention and ability to put that learning into practice at a later time. Therefore review and active student practice are important ingredients of mastery learning.

The goals of mastery learning are best achieved by the instructional sequence of review, present new content, practice, provide feedback, and reteach, as shown in Figure 7.3. This progressive cycle may compose nearly all of the time scheduled for a direct instruction lesson. Many examples in this chapter illustrate this type of instructional sequence. When the content to be taught represents task-relevant prior knowledge for subsequent learning, a direct instruction format provides the best assurance that this knowledge will be remembered and available for later use.

There also are times when direct instruction strategies are inappropriate. When objectives other than learning facts, rules, and action sequences are desired, direct instruction strategies become less efficient and are often far less effective than the inquiry and problem-solving strategies to be discussed in subsequent chapters. Teaching situations that need strategies other than direct instruction include (1) presenting complex material with objectives at the analysis, synthesis, and evaluation levels of the cognitive domain and (2) presenting content that must be learned gradually over a long period. Such material requires learner participation to heighten commitment to the learning process (for example, portfolios, projects, and oral performances) and to create the intellectual framework necessary for learning concepts and recognizing patterns. You can also gain

Figure 7.3 Direct Instructional Sequence for Mastery Learning



your learners' participation through carefully crafted classroom dialogue, which will be illustrated in Chapters 8 and 9. See In Practice: Focus on Mastery Learning.

An Example of Direct Instruction

To see what direct instruction looks like in the classroom, consider the following dialogue, in which the teacher begins a direct instruction sequence to teach the acquisition of facts, rules, and action sequences for forming and punctuating possessives. She begins by informing her students of the lesson's objective. As you read, note the direct instruction strategies in bold italic from Figure 7.2.

Teacher: Today we will learn how to avoid embarrassing errors such as this when forming and punctuating possessives. [Circles an incorrectly punctuated possessive in a newspaper headline.] At the end of the period, I will give each of you several additional examples of errors taken from my collection of mistakes found in other newspapers and magazines. I'll ask you to make the proper corrections and report your changes to the class. Who knows what a possessive is? (***Review and checking***)

Richard: It means you own something.

Teacher: Yes, a possessive is a way of indicating ownership. It comes from the word *possession,* which means "something owned or possessed." Forming possessives and punctuating them correctly can be difficult, as this newspaper example shows. [Points to paper again.] Today I will give you two simple rules that will help you form possessives correctly. But first, to show ownership or possession, we must know who or what is doing the possessing. Lucila, can you recall the parts of speech from last week's lesson? [Lucila hesitates, then nods.] What part of speech is most likely to own or possess something? (***Review and checking***)

Lucila: Well, umm . . . I think . . . I think a noun can own something.

Teacher: Yes, a noun can own something. What is an example of a noun that owns something? Brian?

IN PRACTICE

FOCUS ON MASTERY LEARNING

John B. Carroll inaugurated a fundamental change in thinking about the characteristics of instruction in 1963, when he argued that student aptitudes reflect an individual's learning rate and therefore that some students need more time to learn than others. In this new paradigm, Carroll suggested that instruction should focus more on the time required for different students to learn the same material. This was in contrast with the classic model of instruction, in which the focus is on differences in ability and all students are given the same amount of time to learn.

Carroll's new theory was based on the idea that all learners have the potential to learn any content provided by the teacher but take different amounts of time to do so. Carroll identified two factors that affect the learning rate of a student: perseverance of the student and the opportunity to learn. The first is controlled by the student—that is, how much time he or she spends on learning. The latter is controlled by the teacher, who allots the time to learn.

However, it was Benjamin Bloom who fully developed the concepts now known as *mastery learning* in 1968. In the 1960s, Bloom was involved in research on the role of individual differences in learning. Impressed with Carroll's ideas, he took them further by concluding that if aptitude can predict the rate at which one learns, then the instructional variables under an instructor's control—such as the opportunity to learn and the availability of and instructional materials and resources—should be able to ensure that all learners can attain mastery of any unit or lesson objective. Bloom concluded that given sufficient time and quality of instruction, nearly all students can learn. Bloom's mastery learning model also became instrumental in the nature versus nurture controversy sparked by Jensen (1969) by proposing a model in which the learning environment provided by the teacher, not heredity, accounts for most of a student's learning.

The theory of mastery learning resulted in a radical shift in responsibility for teachers; the blame for a student's failure rests with the instruction, not the student's lack of ability. In this type of learning environment, the challenges are to provide sufficient time and to employ effective instructional strategies so that all students achieve the same level of learning (Bloom, 1981; Levine, 1985). Add to this scenario curriculum-related computer software to differentiate and individualize instruction, and all learners will achieve the same level of learning but at different rates and times.

How to Instruct for Mastery

1. Clearly state the objective of the unit.
2. Divide the unit objective into lessons, each with its own objectives and assessment.
3. Identify the most effective combination of learning materials and instructional strategies for each lesson, such as presentation, recitation, modeling, questioning, discussion, and so forth.
4. Begin unit or lesson with a brief diagnostic test or formative assessment of what students do and do not know about the topic.
5. Use the results of the diagnostic tests to provide instruction and corrective activities in an order of review, present content, practice, and provide feedback that can also be individualized with the use of curriculum-related computer software.
6. Use this cycle first with the whole class and then repeat as needed with the whole class or individuals. No student should proceed to new material until basic material has been mastered.

In summary, mastery learning is an instructional strategy based on the principle that all students can attain lesson and unit objectives with the appropriate instruction and sufficient time to learn. Mastery learning puts the techniques of tutoring and individualized instruction into a group-learning format and brings the learning strategies of successful students to nearly all the students of a given group. In its full form, it includes a philosophy, a curriculum structure, an instructional model, the alignment of student assessment, and a teaching approach.

You will have many options for integrating technology into your direct instruction lessons to ensure that all or most of your learners attain the same level of mastery. Depending on the ability level of the student and available time on the computer, more or less structure can be provided within the content of your direct instruction lesson to differentiate instruction for the student who can benefit from it with regard to the level of difficulty and need for repetition, review, practice, and feedback.

Much of the direct instruction software is available for the elementary grades from the publishers of the textbooks and workbooks you will be using. With the Inspiration 7 software, which was introduced for lesson planning in Chapter 4, it is also possible to prepare your own tailormade direct instruction practice sessions, review, and feedback lessons for grades and content for which commercial software may not be available. The Inspiration 7 software is organized around a template, into which can be dropped lesson content, reviews, and practice activities. It can be made available on your classroom computers, with hyperlinks to other software.

Brian: I don't know.
Teacher: Allison?
Allison: Not sure.
Teacher: Yungwei?
Yungwei: A student can own a pencil. The word *student* is a noun.
Teacher: Good. And who can remember our definition for a noun? (***Review and checking***)
Damian: It's a person, place, or thing.
Teacher: Good. Our first rule is, Use the possessive form whenever an *of* phrase can be substituted for a noun. [Points to this rule written on board.] (***Presenting and structuring***) Let's look at some phrases on the board to see when to apply this rule. Jason, what does the first one say? (***Guided student practice***)
Jason: The daughter of the police officer.
Teacher: How else can we express the same idea of ownership?
Trena: We can say "the police officer's daughter."
Teacher: And we can say "the police officer's daughter" because I can substitute a phrase starting with *of* and ending with *police officer* for the noun *police officer.* Notice how easily I can switch the placement of *police officer* and *daughter* by using the connecting word *of.* Whenever this can be done, you can form a possessive by adding an apostrophe *s* to the noun following *of.* (***Presenting and structuring***) Now we have the phrase [writes on board] *police officer's daughter.* [Points to the apostrophe.] Erica, what about our next example, *holiday of three days?* [Points to board.] (***Guided student practice***)
Erica: We could say "three days' holiday."
Teacher: Come up and write that on the board just the way it should be printed in the school paper. [Erica writes *three day's holiday.*] Does anyone want to change anything?
Desiree: I'm not sure, but I think the apostrophe should go after the *s* in *days.*
Teacher: You're right (***Feedback***), which leads to our second rule: If the word for which we are denoting ownership is a plural ending with *s,* place an apostrophe after the *s.* But if the word is a name—called a *proper noun*—ending with *s,* place an apostrophe and an *s* after the *s.* This is an important rule to remember, because it accounts for many of the mistakes that are made in forming possessives. As I write this rule on the board, copy down these two rules for use later. (***Presenting and structuring***) [Finishes writing second rule on board.] Now let's take a moment to convert each of the phrases on the overhead to the possessive form. Write down your answer to the first one. When I see all heads up again, I will write the correct answer. (***Guided student practice***) [All heads are up.] Good. Now watch how I change this first one to the possessive form. Pay particular attention to where I place the apostrophe; then check your answer with mine. [Converts *delay of a month* to *month's delay.*] Any problems? (***Checking***) [Pauses for any response.] OK, do the next one. [After all heads are up, converts *home of Jenkins* to *Jenkins's home.*] Any problems? [Jason looks distressed.] (***Checking***)
Teacher: Jason, what did you write?
Jason: J-E-N-K-I-N apostrophe s.
Teacher: What is the man's name, Jason?
Jason: Jenkins.
Teacher: Look at what you wrote for the second rule. What does it say? (***Feedback and corrective***)
Jason: Add an apostrophe and an *s* after the *s* when the word is a name that already ends in an *s.* Oh, I get it. His name already has the *s,* so it should be *s* apostrophe *s.* That's the mistake you showed us in the headline, isn't it?
Teacher: Now you've got it. Let's continue. [Proceeds with the following in the same manner: *speech of the president* to *president's speech, the television set of Mr.*

Burns to *Mr. Burns's television set, pastimes of boys* to *boys' pastimes.*] Now open your workbooks to the exercise on page 87. Starting with the first row, let's go around the room and hear your possessives for each of the sentences listed. Spell aloud the word indicating ownership, so we can tell if you've placed the apostrophe in the right place. Allison . . . [Looking at *wings of geese.*] (***Guided student practice***)

Allison: Geeses wings . . . spelled W-I-N-G-S apostrophe.

Teacher: That's not correct. What word is doing the possessing? (***Feedback and corrective***)

Allison: The geese, so it must be G-E-E-S-E apostrophe *s.*

Teacher: Good. (***Feedback***) Practice exercises that provide a review of today's lesson are available on our computers. Before our next test, I want each of you to spend as much time as you need to be sure you get up to the 90% correct mark.

Now let's look at the six direct instruction strategies in Figure 7.2 as they relate to the preceding dialogue.

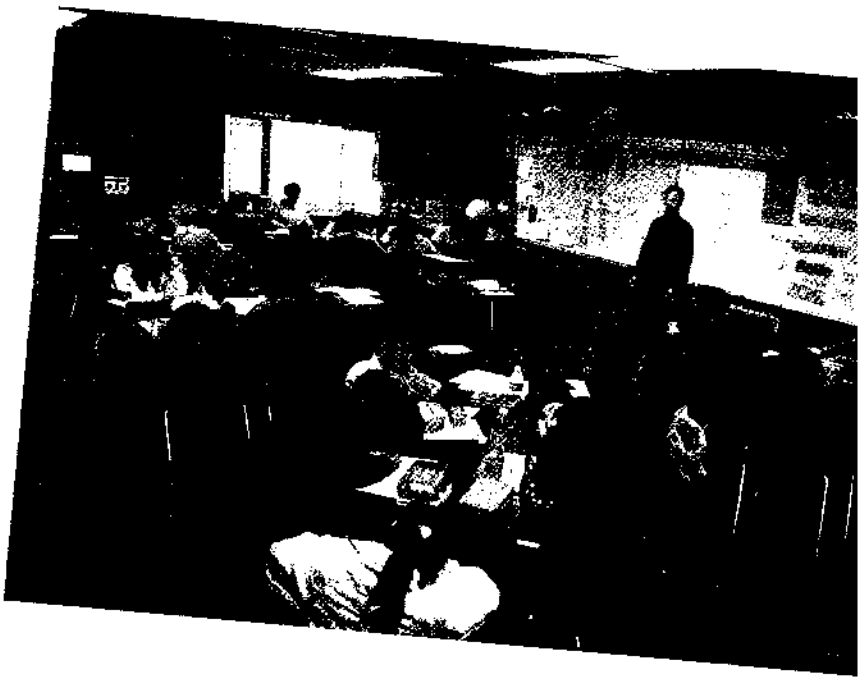
Daily Review and Checking the Previous Day's Work

The first strategy in direct instruction from Figure 7.2 is **daily review and checking.** This function emphasizes the relationship between lessons, so students remember previous knowledge and see new knowledge as a logical extension of content already mastered. Notice that early in the example lesson, the definition of a noun was brought into the presentation. This provided a review of the task-relevant prior knowledge needed for the day's lesson. It also provided students with a sense of wholeness and continuity, assuring them that what was to follow was not isolated knowledge unrelated to past lessons. This is particularly important for engaging students who do not have the appropriate level of task-relevant prior knowledge or who may be overly anxious about having to master yet another piece of unfamiliar content. Review and checking at the beginning of a lesson also is the most efficient and timely way of finding out if your students have mastered task-relevant prior knowledge sufficiently to begin a new lesson; if not, you may reteach the missing content, as shown in Figure 7.2.

You might think that it is common practice to begin a lesson by checking previously learned task-relevant knowledge needed for the day's lesson. Yet many teachers fail to begin a lesson by checking for this knowledge. Daily review and checking at the beginning of a lesson can be easily accomplished in one of several ways:

1. Having students correct each other's homework at the beginning of class
2. Having students identify especially difficult homework problems in a question-and-answer format
3. Sampling the understanding of a few students who are good indicators of the range of knowledge possessed by the entire class
4. Explicitly reviewing the task-relevant information necessary for the day's lesson

Dahllof and Lundgren (1970) propose the use of a steering group of lower- to average-performing students as a particularly effective way of determining the extent to which review and reteaching may be needed. An expanded notion of the *steering group* is a small number of low, average, and high performers who can be queried at the start of class on the task-relevant prior knowledge needed for the day's lesson. When high performers miss a large proportion of answers, this warns you that extensive reteaching for the entire class may be necessary. When high performers answer questions correctly but average performers do not, some reteaching should be undertaken before the start of the lesson. And finally, if most of the high and average performers answer the questions correctly but most of the



A major purpose of daily review and checking is to emphasize the relationships between lessons and to provide students with a sense of wholeness and continuity, assuring them that what is to follow is a logical extension of content already mastered.

low performers do not, you may need to consider differentiating materials or using practice exercises, summary and review sheets, or tutorial arrangements and supplementary instructional software. Doing so will ensure that large amounts of class time are not devoted to review and reteaching that may benefit only a small number of students.

The strategy of daily review and checking, especially when used with a carefully selected steering group, is indispensable for informing you that previous instruction was over the heads of some or most of your students and that additional review and reteaching are necessary.

P

The second strategy in the direct instruction model consists of **presenting and structuring** new content. As we learned, one of the primary ingredients of the direct instruction model is presenting material in small steps. Lessons must be served in small portions that are consistent with the previous knowledge, ability level, and experience of your students. Likewise the content within the lessons must be partitioned and subdivided to organize it into small bits. No portion can be too large, or you will lose your students' attention.

The key is to focus the material on one idea at a time and to present it so learners master one point before you introduce the next point. This is most easily accomplished by dividing a lesson into easily recognizable subparts, rules, or categories. It is no coincidence that the strategy of "Divide and conquer" is as appropriate in the classroom as in a military battle. Just like any great warrior, you can derive much benefit from it.

Remember that the subdivisions you use can be your own; they need not always follow those provided by the text, workbook, or curriculum guide. In fact, there is an important difference between the content divisions used in books and those needed in teaching: Content divisions in texts, workbooks, and curriculum guides generally are created for the purpose of communicating content intended to be read, not for the purpose of presenting content that must be explained orally to learners within the timeframe of a specific lesson. Consequently, published divisions such as chapter titles, subheadings, and sections identified with roman numerals in outlines sometimes are too broad to form the bite-sized pieces that students can easily digest within a lesson.

Unfortunately, many beginning teachers stick tenaciously to these formal headings without realizing either the volume of content that falls within them or the time it takes to orally explain, illustrate, and practice this content. The truth is that you are not discarding content if you create new, more manageable organizational divisions; you only are breaking the content into smaller steps suitable for presentation in a single period. You can create your own subdivisions consisting of rules ("Here are some rules to follow"), steps ("We will do this, then that"), or practices ("Here is the first of five things we will cover"). These subdivisions will organize your instruction into bite-sized pieces and, most importantly, communicate this organization to your students.

In Chapter 2 (Figures 2.2 and 2.3), we illustrated the importance of structuring content in ways that are meaningful to students (e.g., general to detailed, simple to complex, etc.). Following are some additional ways of structuring content that are particularly relevant to direct instruction. These are the part–whole, sequential, combinations, and comparative methods of structuring content.

Part–Whole Relationships

A part–whole organizational format introduces the topic in its most general form ("What is a possessive?") and then divides it into easy-to-distinguish subdivisions (Rule 1, Rule 2). This creates subdivisions that are easily digested and presents them in ways that always relate back to the whole.

Students should always be aware of the part being covered at any particular time ("This is Rule 2") and its relationship to the whole ("This leads to our second rule for denoting ownership"). Use verbal markers to alert students that a transition is underway ("This is Rule 1," "Here is the first part," "This is the last example of this type; now let's move to the next type").

This type of organization creates bite-sized chunks. It helps students organize and see what is being taught and informs them of what portion they are studying. A part–whole organization is illustrated in Figure 7.4.

Sequential Relationships

Another way of structuring content is by sequential ordering; you teach the content according to the way in which the facts, rules, or sequences to be learned occur in the real world. Students may already have a feel for sequential ordering from practical experience.

In algebra, for example, an equation is solved by first multiplying, then dividing, then adding, and finally subtracting. This order of operations must occur for a solution to be correct. A sequentially structured lesson, therefore, might introduce the manipulation of signed numbers in the order multiplication–division–addition–subtraction. Doing so reinforces the

Figure 7.4 Structuring a Lesson by Identifying Part–Whole Relationships

Figure 7.5 Structuring a Lesson by Identifying Sequential Relationships

$$y = a - b + \frac{cd}{e}$$

1. First let's determine cd when
   $c = -1, d = 2$
   $c = 0, d = -4$
   $c = 2, d = -3$

2. Next let's determine $\frac{cd}{e}$ when
   $cd = -2, e = -2$
   $cd = 0, e = 1$
   $cd = -6, e = -4$

3. Now let's determine $b + \frac{cd}{e}$ when
   $b = 1, \frac{cd}{e} = 1$
   $b = -2, \frac{cd}{e} = 0$
   $b = 2, \frac{cd}{e} = -1.5$

4. Finally, let's determine $a - b + \frac{cd}{e}$ when
   $a = 10, b + \frac{cd}{e} = 2$
   $a = 7, b + \frac{cd}{e} = -3$
   $a = 5, b + \frac{cd}{e} = .5$

way an equation must actually be solved, making the skill and behavior you are teaching more authentic. In other words, you would complete all examples used in teaching signed-number multiplication before introducing any examples about division, thereby teaching the correct sequence as well as the intended content. Sequential ordering is illustrated in Figure 7.5.

Combinations of Relationships

A third way you can structure lesson content is to bring together in a single format combinations of elements or dimensions that influence the use of facts, rules, and sequences. This allows an overall framework to direct the order of content by showing the logic of some combinations of facts, rules, and sequences and the illogic of other combinations.

For example, in teaching a direct instruction lesson in geography, you might develop a scheme to reveal the relationship between marketable products and the various means of transporting them to market. You could draw an organizational chart (see Figure 7.6) to

Figure 7.6 Structuring a Lesson by Identifying Combinations of Relationships

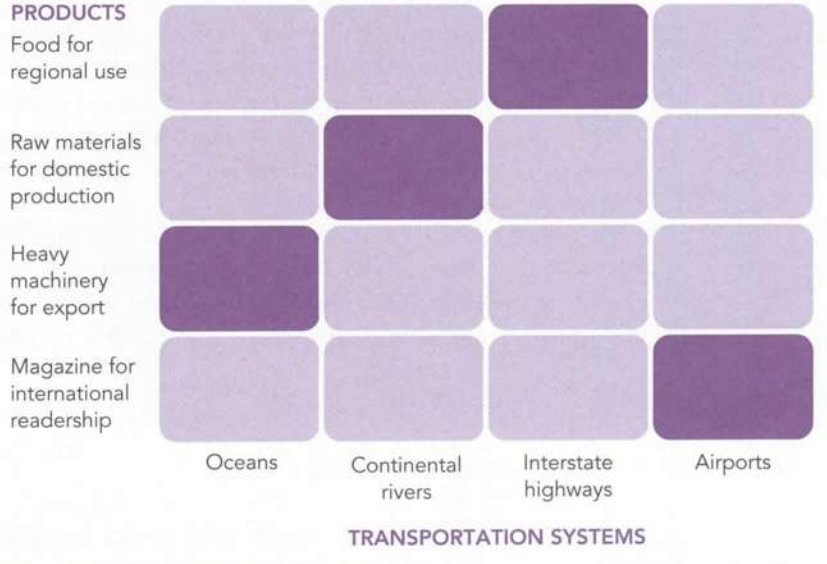


Figure 7.7 Structuring a Relationship by Identifying Comparative Relationships

Points of Comparison	United States	England
Economics	Capitalism	Capitalism
Politics	Representative democracy	Parliamentary democracy
Source of laws	U.S. Constitution	English legal codes
Representative body	Congress	Parliament

structure the content. You could show the chart to your students and then teach all the relevant facts (e.g., relative weights of products), rules (the heavier the product, the more efficient the transportation system must be), and action sequences (first analyze the product's size and weight, then choose the best location). The shaded cells in Figure 7.6 identify the combinations, or dimensions of content, that are most relevant to the objectives of the lesson.

Comparative Relationships

With the comparative relationships method of structuring content, you place different categories of content or topics side by side so learners can compare and contrast them. Placing facts, rules, and sequences side by side across two or more categories enables students to observe their similarities and differences. For example, you might want to compare and contrast governmental aspects of the United States and England. You could order the instruction according to the format shown in Figure 7.7. Then you could teach the relevant economics (economic systems), politics (type of government), source of laws (U.S. Constitution versus English legal codes), and representative body (Congress versus Parliament) by moving first across the chart and then down. The chart structures the content, and students can easily see the structure and content to be covered as it is being taught.

Using the Methods

Whether you use one structuring method or a combination to organize a lesson, remember to divide the content into bite-sized pieces. To the extent these structuring techniques divide larger units of content into smaller and more meaningful units, they will have served an important purpose.

Finally, note how the teacher in our classroom dialogue combined rules and examples in organizing and presenting the content. She always presented the rule first and then followed it with one or more examples. Note also that after some examples illustrating the rule, she repeated it—either by having students write the rule after seeing it on the board or by having a student repeat it to the class. Giving a rule, then an example of the rule, followed by repetition of the rule is called the **rule–example–rule order.** It generally is more effective than simply giving the rule and then an example (rule–example order) or giving an example followed by the rule. Also learning a rule in one sensory modality (e.g., seeing it on the board) and then recreating it in a different sensory modality (e.g., writing or speaking it) will promote greater learning and retention than seeing the rule only once or reproducing it in the same modality in which it was learned.

GUIDED STUDENT PRACTICE

The third step in the direct instruction model is **guided student practice.** Recall from the structure of a lesson plan that presentation of stimulus material is followed by elic-

iting practice with the desired behavior. This section presents several ways of accomplishing this in the context of the direct instruction model. These elicitations are teacher guided, providing students with guided practice that you organize and direct.

Recall the important ingredients for eliciting a student response. One is to elicit the response in as nonevaluative an atmosphere as possible; this frees students to risk creating responses they may be unsure of but from which they can begin to build a correct response. Any response, however crude or incorrect, can be the basis for learning, if it is followed by nonevaluative feedback and correctives.

A second ingredient for eliciting a student response is the use of covert responses. Doing so not only ensures a nonthreatening environment but also encourages student engagement in the learning task with the least expenditure of your time and effort. In the preceding example dialogue, by having students privately write their responses before seeing the correct answers on the overhead, the teacher guided each student to formulate a response; it was not necessary to call on each of them. She guided the students into responding by encouraging and later rewarding their covert responses.

An equally important aspect of eliciting a desired response is to check for student understanding. When necessary, prompt to convert wrong answers to right ones. In the example dialogue, the teacher stopped after every item to see if there were problems and prompted students to create correct answers, when necessary. Prompting is an important part of eliciting the desired behavior, because it strengthens and builds learners' confidence by encouraging them to use some aspects of the answer that have already been given in formulating the correct response (Gagné et al., 1997). In the example dialogue, Jason was encouraged to *rethink* his response, to *focus* consciously on the specific part of the problem causing the error, and to *remember* the rule that will prevent making such errors in the future.

Prompting

One guided student practice during direct instruction is providing prompts, hints, and other types of supplementary instructional stimuli to help learners make the correct response. You can use three categories of prompts to shape the correct performance of your learners: verbal prompts, gestural prompts, and physical prompts.

Verbal Prompts. **Verbal prompts** can be cues, reminders, or instructions to learners that help them perform correctly the skill you are teaching. For example, saying to a first-grade learner as he is writing "Leave spaces between words" reminds him what you previously said about neat handwriting. Or saying "First adjust the object lens" to a learner while she is looking at a microscope slide prompts her as she is learning how to use a microscope. Verbal prompts help guide the learner to connect performances and prevent mistakes and frustration.

Gestural Prompts. **Gestural prompts** model or demonstrate for learners particular skills you want them to perform. For example, if you were to point to the fine adjustment knob on the microscope and make a turning gesture with your hand, you would be prompting, or reminding, the student to perform this step of the process. Gestural prompts are particularly helpful when you anticipate that the learner may make a mistake. You can use gestural prompts routinely to remind learners how to fold a piece of paper, how to grasp a pair of scissors, how to raise their hands before asking a question, or how to hold a pen properly when writing.

Physical Prompts. Some learners may lack the fine muscle control to follow a demonstration and imitate the action being modeled. For example, you might verbally describe how to form the letter *a* and demonstrate this for the learner, and the learner may still be unable to write *a* correctly. In such a case, you might use your hand to guide the learner's

hand as he writes. This is called a **physical prompt.** With a physical prompt, you use hand-over-hand assistance to guide the learner to the correct performance. You can routinely use physical prompts to assist learners with handwriting, cutting out shapes, tying shoelaces, correctly holding a dissecting tool, or performing a complex dance routine.

Least-to-Most Intrusive Prompting. Many educators recommend that you use the least intrusive prompt first when guiding a learner's performance. Verbal prompts are the least intrusive; physical prompts are the most intrusive (Cooper, Heron, & Heward, 1987). Thus it would be more appropriate first to say "Don't forget the fine adjustment!" when guiding a learner in the use of a microscope than to take the learner's hand and physically assist her.

The reason behind using a least-to-most intrusive order is that verbal prompts are easier to remove or fade than are physical prompts. Learners who depend on physical prompts to perform correctly will find it more difficult to demonstrate a skill independently of the teacher and to acquire authentic behavior.

Full-Class Prompting. You can also check for understanding and prompt for correct responses using the full class. The example dialogue showed one approach: The teacher asked all the students to respond privately at the same time and then encouraged them to ask for individual help ("Any problems?").

Another approach is to call on students whether or not their hands are raised, thereby seeking opportunities to prompt and correct wrong answers. One version of this is called **ordered turns,** in which you systematically go through the class and expect students to respond when their turn arrives. With small groups, this approach can be more effective in producing student achievement gains than randomly calling on students, because everyone is likely to get one or more repeated turns. But generally, the ordered turns method is less efficient when selecting students to respond during full-class instruction, because students can easily gauge the time they will have to be disengaged until their individual turns arrive. Yet another approach is to have students write out answers to be checked and perhaps corrected by a classmate.

Finally, you can develop questions beforehand to test for the most common errors. Check student responses for accuracy, and prompt them when necessary. This approach has the advantage of assuming that not everyone understands or has the correct answer when no response is received. Researchers have found this approach to be particularly effective in increasing student achievement (Angelillo, 2008; Rosenshine, 1995; Rosenshine & Stevens, 1986).

Modeling

Another guided student practice is modeling. *Modeling* is a teaching activity that involves demonstrating to learners what you want them to do or think. When used correctly, modeling can assist learners to acquire a variety of intellectual and social skills more effortlessly and efficiently than with verbal, gestural, or physical prompts alone. Modeling is particularly effective for younger learners, who may not be able to follow complex verbal explanations; for visually dominant learners, who may need to see how something is done before they can actually do it; and for communicating mental strategies for problem solving to all ages of learners.

Bandura and his colleagues have studied how and why we learn from models (Bandura, 1997; Griffin, 2007; Zimmerman, 1989). Their research on modeling is referred to as **social learning theory,** and it attempts to explain how people learn from observing other people. From these researchers' work, we know that children can learn not only attitudes, values, and standards of behavior from observing adults and peers but also physical and intellectual skills.

Some of this learning takes place by directly imitating what a teacher is doing; other learning takes place by inferring why the model is acting a certain way or what type of

person the model is. For example, learners acquire certain values about the importance of learning, caring for others, doing work neatly, or showing respect for other cultures by observing how their parents, friends, and teachers actually behave in the real world and then inferring from their observations how they, too, should behave.

Although teachers model all the time, we know that some forms of modeling are more effective than others. Zimmerman (1989) found that teachers who were taught the practice of modeling were far more effective at helping young children to learn than teachers who were not.

Modeling is a direct teaching activity that allows students to imitate from demonstration or infer from observation the behavior to be learned. Four psychological processes need to occur for your learners to benefit from modeling:

1. Attention
2. Retention
3. Production
4. Motivation

Let's take a closer look at each of these to discover how students learn from what they see.

Attention. Demonstrations are only of value if learners look at and/or listen to them. In other words, without attention, there can be no imitation or observational learning. The previous section highlighted the importance of gaining a learner's attention. Modeling requires that you not only gain your learners' attention but that you retain it throughout the lesson.

Bandura (1986) found that learners pay attention better under the following conditions:

1. The model is someone who is respected as an expert in his or her field.
2. The model is demonstrating something that has functional value to learners. Learners pay little attention to those things for which they see no immediate relevance.
3. The demonstration is simplified by subdividing it into component parts and presenting it in a clearly discernible step-by-step fashion.

Retention. Teachers model because they want their learners to be able to repeat their same actions when they are no longer present. For example, teachers typically model when they demonstrate how to add a column of numbers, sound out a word, or evaluate a short essay. But the transfer of these demonstrated actions will only occur if learners remember what they saw or heard. Demonstrations from which imitation is to occur must be planned with the goal of retention in mind.

Learners are more likely to remember the following types of demonstrations:

1. *Demonstrations linked to previously learned skills or ideas.* The more meaningful the demonstration, the more likely it will be retained. ("Remember how yesterday we added one-digit numbers in a column? Well, today we will use the same procedure on numbers that have two or more digits.")
2. *Demonstrations that include concise labels, vivid images, code words, or visual mnemonics.* These devices (discussed in Chapter 10) help learners hold new learning in memory. ("Look at how I hold my lips when I pronounce this next word.")
3. *Demonstrations that are immediately rehearsed.* This rehearsal can be overt, as when the teacher asks learners to say or do something immediately following the demonstration, or covert, as when learners visualize or mentally create an image of what the teacher demonstrated. ("Now, everyone read the next passage to themselves, repeating silently the sequence of steps I just demonstrated.")

Production. The third component of the modeling process occurs when learners actually do what the teacher demonstrated. In this stage of the process, the mental images or verbal codes learners retained in memory direct their actual performance. Learners recall

these images or codes by the practice situation the teacher creates and by the verbal cues he or she gives. Having been evoked, these images guide the actual performance of what was learned during the demonstration.

Learners are more likely to produce what they have seen under the following conditions:

1. Production closely follows the retention phase. ("OK, now that you've practiced remembering the correct sequence of steps I demonstrated, let's use them to interpret the meaning of the following passage.")
2. The practice situation contains cues or stimuli that evoke the retained mental images or verbal codes. ("This next word requires you to position your lips exactly as you saw me do in the last example.")
3. The performance immediately follows mental rehearsal. ("Let's switch to several new examples that you haven't seen before.")

The production phase increases the likelihood that images of the demonstration learners have remembered will guide the production of newly acquired behavior. In addition, this phase allows the teacher to observe learners and give feedback on how well they have mastered the behavior. Giving learners information about the correctness of their actions—without expressing negativity or dissatisfaction—has been shown to increase the likelihood of a correct performance (Borich & Tombari, 1997, pp. 341–342).

Motivation. The final stage of the process of learning through modeling occurs when learners experience desirable outcomes following their performance. Desirable outcomes usually take the form of some type of teacher praise, which motivates learners to want to imitate what they have seen at some future time. Learners are less likely to repeat the actions of a model if they have experienced punishing or unsatisfying consequences following their initial attempt at imitation.

Learners are more likely to repeat the actions of a model both immediately and to transfer it to new situations over time when the following occur:

1. Praise and encouragement, rather than criticism, immediately follow performance. ("Your answer is partly correct; think some more about what we have just discussed," as opposed to "Your answer is wrong. You were not listening again.")
2. The praise is directed at specific aspects of the performance. ("I like how you left big enough spaces between your words," as opposed to "That's neat.")
3. Directions, rather than corrections, follow an incorrect performance. ("Remember, the first step is to generate a hypothesis," as opposed to "You don't describe the research conclusions before you state the hypothesis!")

Feedback and Correctives

Our next strategy in the direct instruction model is to provide **feedback and correctives.** You will need strategies for handling right and wrong answers. Four categories of student response you will see in your classroom are (1) correct, quick, and firm; (2) correct but hesitant; (3) incorrect due to carelessness; and (4) incorrect due to lack of knowledge.

Correct, Quick, and Firm

The student response that teachers strive most to inspire is correct, quick, and firm. Such a response most frequently occurs during the latter stages of a lesson or unit, but it can occur almost anytime during a lesson or unit if you have divided the content into bite-

sized portions. A moderate to high percentage of correct, quick, and firm responses is important if students are to become actively engaged in the learning process.

Not every response from every student must be a correct one, but for most learning that involves knowledge acquisition, make the steps between successive portions of your lesson small enough to produce approximately 60% to 80% correct answers in a practice and feedback session (Bennett, Desforges, Cockburn, & Wilkinson, 1981; Brophy & Evertson, 1976; Lindsley, 1991). Once 60% to 80% right answers have been produced, you will have created a rhythm and momentum that heightens student attention and engagement and provides for a high level of task orientation. The brisk pace of providing right answers also will help minimize irrelevant student responses and classroom distractions.

Correct but Hesitant

The second type of student response is correct but hesitant. This type frequently occurs in a practice and feedback session at the beginning or middle of a lesson. Giving positive feedback to the student who supplies a correct but hesitant response is essential. The first feedback to provide in this instance is a positive, reinforcing statement, such as "Good" or "That's correct," because the correct but hesitant response is more likely to be remembered when linked to a warm reply. The second feedback to provide is to restate the answer, assuring the student that it is correct. This will not only aid the student who is giving the correct but hesitant response, but it will also help reduce hesitant responses from other students who hear the restatement.

Incorrect Because of Carelessness

The third type of student response is incorrect because of carelessness. As many as 20% of student responses fall into this category, depending on the time of day and the students' level of fatigue and inattentiveness. When this occurs and you feel a student really knows the correct response, you may be tempted to scold, admonish, or even verbally punish him or her for responding thoughtlessly (e.g., "I'm ashamed of you," "That's a dumb mistake," "I thought you were brighter than that"). You should resist temptation, however, no matter how justified it may seem. Nothing is more frustrating than to repress genuine emotions, but researchers and experienced teachers agree that you do more harm than good if you react emotionally to this type of response. Verbal punishment rarely teaches students to avoid careless mistakes. The best response is to acknowledge that the answer is wrong and to move immediately to the next student for the correct response. By doing so, you will make a point to the careless student that he or she lost the opportunity for a correct response and the praise that goes with it.

Incorrect Because of Lack of Knowledge

The fourth type of student response is incorrect because of a lack of knowledge. These errors typically occur, sometimes in large numbers, during the initial stages of a lesson or unit. When they do occur, it is better to provide hints, probe, or change the question or stimulus to a simpler one that engages the student in finding the correct response than to simply give the student the correct response. Your most important goal at this stage of the lesson or unit is to engage the learner in the process by which the right answer can be found.

In the example lesson, the teacher tried to focus Jason on the apostrophe *s* he had missed at the end of the proper noun *Jenkins* and to restate the rule concerning formation of possessives in words ending in *s*. Likewise the teacher probed Allison after her wrong answer by asking, "What word is doing the possessing?" Each of these probes led to the right answer without actually telling it to the student. When your strategy channels a student's thoughts to produce the right answer without your actually giving it, you provide a framework for producing correct responses to all similar problems.

Strategies for Incorrect Responses

The most common strategies for incorrect responses are the following:

1. Review the key facts or rules needed to produce a correct solution.
2. Explain the steps used to reach a correct solution.
3. Prompt with clues or hints that represent a partially correct answer.
4. Use a different but similar problem to guide the student to the correct answer.

Reviewing, reexplaining, and prompting are effective until approximately 80% of the students respond correctly. After that point, make the correctives briefer, eventually guiding students who are making incorrect responses to helpful exercises in the text or to remedial exercises (Bennett & Desforges, 1988).

Lindsley (1992) makes a useful distinction between active and passive responding that is related to the accuracy of your learners' responses. **Active responding** includes orally responding to a question, writing out the correct answer, calculating an answer, or physically making a response (e.g., focusing a microscope). **Passive responding** includes listening to the teacher's answer, reading about the correct answer, or listening to classmates recite the right answer.

Huffman (2005) and Greenwood, Delguardi, and Hall (1984) report a strong and positive relationship between learner achievement and active responding. They also report that nearly half of a typical learner's day may be involved in passive responding. These researchers urge you to plan lessons so learners spend about 75% of their time engaged in active responding. They also recommend that you design practice activities to elicit correct responses about 60% to 80% of the time. Learners acquire basic facts and skills faster when their opportunities for practice result in high rates of success (Lindsley, 1991).

In summary, when providing feedback and corrections, do these things:

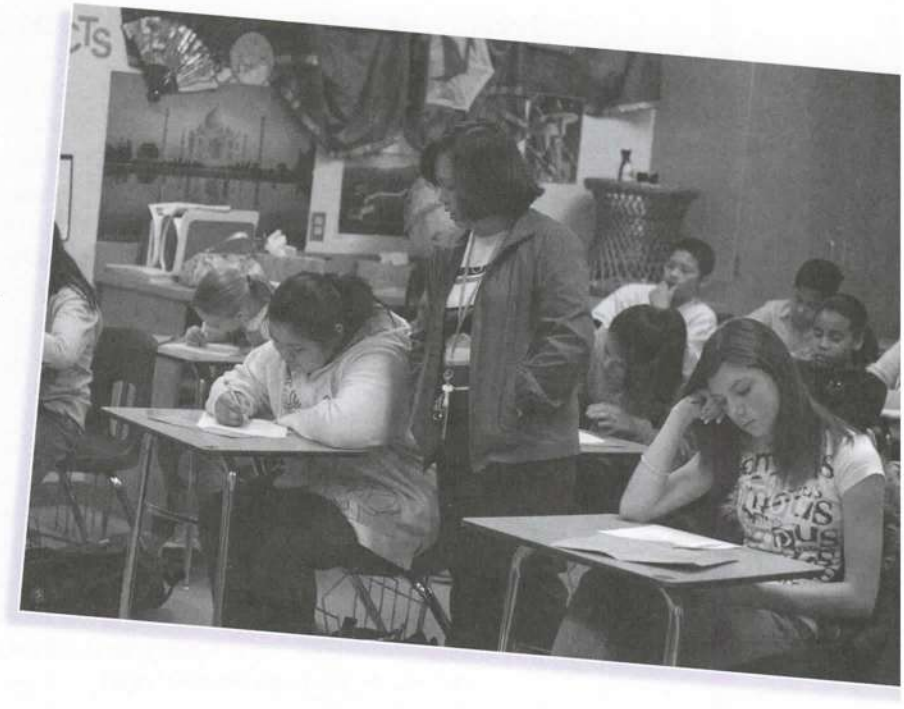
- Give directions that focus on the response you want learners to make.
- Design instructional materials both for initial learning and practice so learners can produce correct answers 60% to 80% of the time.
- Select activities to engage your learners in active responding about 75% of the time.

INDEPENDENT PRACTICE

The fifth strategy for direct instruction is the opportunity for **independent practice.** Once you have successfully elicited the behavior, provided feedback, and administered correctives, give students the opportunity to practice the behavior independently. Often this is the time when facts and rules come together to form action sequences. For example, learning to drive a car requires a knowledge of terminology and rules. But until the knowledge and rules are put together in an action sequence, meaningful learning has not occurred.

Independent practice provides the opportunity in a carefully controlled and organized environment to make a meaningful whole out of the bits and pieces. Facts and rules must come together under your guidance and example in ways that (1) force simultaneous consideration of all the individual units of a problem and (2) connect the units into a single harmonious sequence of action. Learning theorists call these two processes *unitization* and *automaticity.*

Notice the manner in which these two processes were required in the example lesson. The individual units were the definition of a possessive (a fact) and two statements about forming possessives (Rules 1 and 2). The lesson connected these units into a single, harmonious sequence of action in two ways. First was the exercise with which the example ends, in which the teacher directed students to a workbook to provide an independent practice



During independent practice, the teacher circulates around the classroom, scanning written responses, prompting for alternative answers, and reminding students of necessary facts or rules, being careful to keep interchanges short so that the work of as many students as possible can be checked.

opportunity. The workbook sentences should contain possessives similar to those found in any newspaper, magazine, or school essay. Second was the teacher's intention to provide examples of mistakes occurring in actual newspapers and magazines for additional practice at the end of the lesson. Figure 7.8 traces the steps a student might take in translating facts and rules into an action sequence for one sentence in the workbook.

In the preceding dialogue, the teacher's examples of errors from newspapers and magazines provided students an opportunity to form action sequences from the facts and rules they learned. These real-life examples further increased the authenticity of their learning. In your own classroom, make opportunities for practice increasingly resemble applications in the real world until the examples you provide are indistinguishable from those outside the classroom. Using clippings from actual newspapers and magazines was this teacher's way of doing so. Be sure to check the software available through your

Figure 7.8 Steps Involved in Translating a Sentence into Correct Possessive Form

STEP 1	Is ownership indicated in this sentence?
STEP 2	If yes, where? The paper belongs to Mrs. Jones. The friend belongs to Robert.
STEP 3	Has an *of* phrase been substituted for a noun (Rule 1)? If yes, where? *A friend of Robert* has been substituted for *Robert's friend.*
STEP 4	Does any word denoting ownership end in *s*? (Rule 2) If yes, where? *Jones* paper should be written *Jones's* paper.
STEP 5	Therefore, the correct possessive form of this sentence is *In Mrs. Jones's paper there was an article about Robert's friend.*

school and textbook and workbook publishers for other opportunities to provide your learners independent practice.

The purpose of providing opportunities for all types of independent practice is to develop automatic responses in students, so they no longer need to recall each individual unit of content but can use all the units simultaneously. Thus the goal of the example lesson was "To write a sentence using possessives correctly," not "To recite Rule 1 and Rule 2." Automaticity is reached through mastery of the units that make up a complete response and sufficient practice in composing these pieces into a complete action sequence. Your goal is to plan sufficient opportunities for independent practice to allow students' individual responses to become composed and automatic.

Regardless of the type of practice activity used, keep in mind several guidelines for promoting effective practice:

- *Students should understand the reason for practice.* Practice often turns into busywork, which can create boredom, frustration, and noncompliance. Learners should approach classroom practice with the same enthusiasm with which an Olympic athlete pursues doing laps in the pool or on the track. This is more likely to occur if (1) you make known to learners the purpose of the practice ("We will need to be proficient at solving these problems in order to go on to our next activity"), and (2) practice occurs during as well as after new learning ("Let's stop right here, so you can try some of these problems yourselves").
- *Effective practice is delivered in a manner that is brief, nonevaluative, and supportive.* Practice involves more than simply saying "Take out your workbooks" or "Go to the computer terminals." Rather your introduction to a practice activity should accomplish three objectives: (1) to inform learners that they are going to practice something they are capable of succeeding at ("You've done part of this before, so this shouldn't be much different"); (2) to dispel anxiety about doing the task through the use of nonevaluative and nonthreatening language ("You've got part of it right, Anita. Now think some more and you'll have it"); and (3) to let learners know that you will be around to monitor their work and support their efforts ("I will be around to help, so let me know if you are having a problem").
- *Practice should be designed to ensure success.* Practice makes perfect only when those who are practicing are doing so correctly. If your learners are making many math, punctuation, or problem-solving mistakes, practice is making imperfect. Design your practice to produce as few errors as possible. For example, use worksheets or software that ensures that most learners complete at least 60% to 80% of the problems correctly the first time through the material.
- *Practice should be arranged to allow students to receive feedback.* As we learned earlier in our discussion of modeling, giving feedback exerts a powerful effect on learning. Develop procedures and routines for rapid checking of work, so learners know as soon as possible how well they are performing. Using peers to correct one another's practice is an efficient way to give feedback. Also having answer sheets handy so learners can check their own work can be a simple and effective means of providing feedback. And don't forget to look for autotutorial software that can detect student errors and provide additional exercises at the learner's current level of understanding.
- *Practice should have the qualities of progress, challenge, and variety.* Some have found that the key to preventing learners from becoming bored is to design practice opportunities so they actually see that they are making progress ("Don't forget to check your answers with the key on the board"). In addition, introduce practice in a challenging and enthusiastic manner ("This will really test your understanding with some new and interesting kinds of problems"). Finally, practice exercises should include a variety of examples and situations.

Doing the following activities can help ensure that your students become actively engaged in the practice you provide:

1. *Walk* the class through the first few independent practice items by talking through them aloud. Doing so gives the scheduled seatwork a definite beginning, and students who are unclear about the assignment can ask questions without distracting others. This also provides a mental model for attaining a correct answer, which students can use in subsequent problems.
2. *Schedule* seatwork or computer time as soon as possible after the eliciting and feedback exercises. This helps students understand that independent practice is relevant to the guided practice provided earlier. If you do not provide opportunities for independent practice immediately after but rather on a later day, students likely will make a high number of requests for information; this will lead to your inefficiently repeating key portions of the previous day's lesson. As with all forms of learning, practice should follow the time of learning as soon as possible for maximum recall and understanding.
3. *Circulate* around the classroom while students are engaged in independent practice to provide feedback, ask questions, and give brief explanations (Emmer & Evertson, 2009). Spread circulation time equally across most of your students; don't concentrate on a small number of students. Try to average 30 seconds or less per student. Monitoring student responses during independent seatwork can be an important function of direct instruction if you keep contacts short and focused on specific issues for which a brief explanation is adequate.

Weekly and Monthly Reviews

The sixth and final direct instruction strategy involves conducting **weekly and monthly reviews.** Periodic review ensures that you have taught all task-relevant information needed for future lessons and identified areas that require reteaching of key facts, rules, and sequences. Without periodic review, you have no way of knowing whether direct instruction has been successful in teaching the required facts, rules, and sequences.

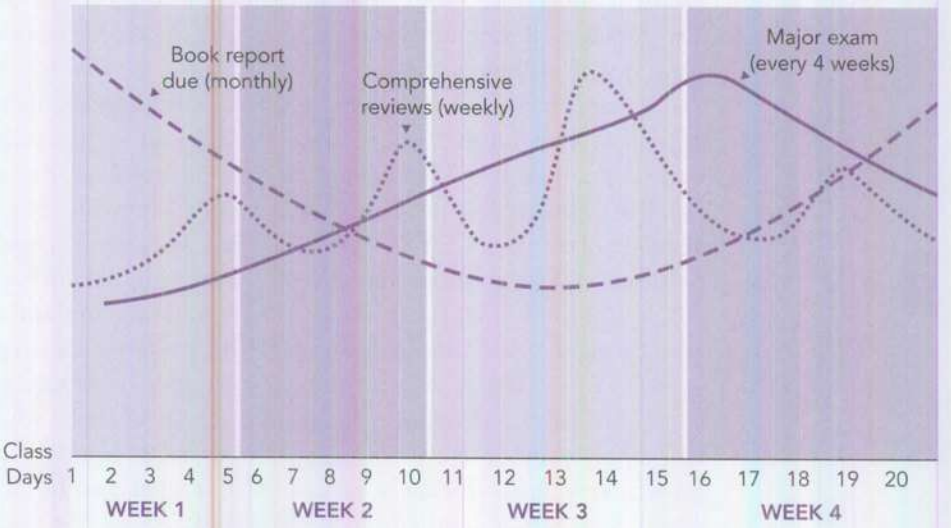
Periodic reviews have long been a part of almost every instructional strategy. In the context of direct instruction, however, periodic review and the recycling of instruction take on added importance because of the brisk pace at which direct instruction is conducted. You can establish the proper pace by noting the approximate percentage of errors that occur during guided practice and feedback; having 60% to 80% correct responses indicates a satisfactory pace.

Weekly and monthly reviews also help determine whether the pace is right or should be adjusted before covering too much content. When student responses in weekly and monthly reviews are correct, quick, and firm about 95% of the time, the pace is adequate. Independent practice and homework should raise the percentage of correct responses from approximately 60% to 80% during guided practice and feedback to approximately 95% on weekly and monthly reviews. If the results are below these levels—and particularly if they are substantially below—your pace is too fast and some reteaching of facts, rules, and sequences may be necessary. This is especially true if the material is prerequisite to later learning.

Another obvious advantage of weekly and monthly reviews is that they strengthen correct but hesitant responses. Reviewing facts, rules, and sequences that are the basis of task-relevant prior understanding for later lessons will give some learners a second chance to grasp material that they missed or only partially learned the first time around. Students often welcome these reviews; they provide a chance to go over material students may have missed, found difficult to learn the first time through, or may come across on unit tests.

Finally, having a regular weekly review (not a review "every so often") is the key to performing this direct instruction strategy. Weekly reviews are intended to build momentum. Momentum results from gradually increasing the coverage and depth of each weekly review until it is time for a comprehensive monthly review or exam. These

Figure 7.9 Cycle of Rising and Falling Action



Note: The height of a cycle indicates relative amounts of instructional focus and student intensity.

reviews help you to sequence and pace the content you present and keeps your instruction aligned with your curriculum guide and state standards.

The objective is to create a review cycle that rises and falls in about a month, as shown in Figure 7.9. The low point of this cycle occurs at the start of a direct instruction unit, when only a week's material needs to be reviewed. The weekly review then becomes increasingly comprehensive until a major monthly assessment checks for understanding of all the content and standards covered in the previous month. Momentum is built by targeting greater and greater amounts of instruction for review, while other assignments—for example, a book report—are purposefully scheduled at the low points of the review cycle, when students are not responsible for assimilating a large amount of accumulative review material. The comprehensiveness of a review should build gradually, so students are not overwhelmed with a lot of unfamiliar content and always know what will be covered in the next review.

OTHER FORMS OF DIRECT INSTRUCTION

Finally, keep in mind that direct instruction does not only occur in a presentation–recitation format. Other ways for executing the direct instruction model (either independent of the presentation–recitation format or in association with it) include computer-assisted instruction, peer and cross-age tutoring, various kinds of audiolingual and communication tools (e.g., recorded lessons for learning to read in the early grades), and use of the computer and CD-ROM as an information and practice provider. These forms should be included in your lesson plans. Many of them have been creatively programmed to include most of the six strategies for direct instruction (reviewing and checking, presenting and structuring, providing guided student practice, giving feedback and correctives, doing independent practice, and conducting reviews) and often provide opportunities to differentiate your instruction for different groups (e.g. higher-, middle- and lower-performing learners).

However, because these alternatives are much less under your control than is the presentation–recitation format you personally create, you should carefully consider their

Video Window

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The Direct Instruction Model

In this video, you will see Bob using the direct instruction model to teach a lesson on the Vietnam War in a high school history class. As you watch this lesson unfold, ask yourself whether this teacher's lesson goal is to teach facts, rules, and sequences or to teach concepts, patterns, and abstractions. Taking your answer into account, indicate how well Bob achieved his goal by implementing the following five criteria, suggested by Rosenshine and Stevens (1986), for an effective direct instruction lesson. Which criteria were met and which were not?

- Clearly presents goals and main points
- Presents content sequentially
- Is specific and concrete
- Checks for students' understanding
- Reteaches what students have difficulty understanding

Go to the Assignments and Activities section of Topic 8: "Explicit Instruction Models" in the MyEducationLab for your course and complete the activity "The Direct Instruction Model."

applicability to your specific instructional goals and students. Whenever using these formats and associated courseware, be sure to preview both their method and content for adherence to the principles of the direct instruction model we have covered. Building a library of individualized courseware that covers the basic skills most frequently needed in your grade level and content area will be an important goal for differentiating your lesson plans.

Following is a lesson plan for our direct instruction dialogue that follows the format provided in Chapter 4.

Example Direct Instruction Lesson Plan

Grammar

Unit Title: Punctuation

Lesson Title: Forming and Punctuating Possessives

1 **Gaining attention.** Display the October school newspaper with a punctuation error in headline. Point to the error.

2 **Informing the learner of the objective.** At the end of the period, students will be able to find mistakes in newspapers (in my file under "Punctuation") and make the necessary changes.

3 **Stimulating recall of prerequisite learning.** Review the part of speech most likely to own or possess something by asking students for the definition of a noun.

4 **Presenting the stimulus material.** Present two rules of possession: Rule 1. Use the possessive form whenever an *of* phrase can be substituted for a noun. Rule 2. For words that are plurals ending in *s,* place an apostrophe after the *s.* But for proper nouns ending in *s,* place an apostrophe *s* after the *s.* Write the rules on the board.

5 **Eliciting the desired behavior.** Display the following examples on a transparency, and ask students to convert them to the possessive form one at a time. See the text, pages 101–103, for other examples.

Delay of a month
Home of Jenkins
Speech of the president
The television set of Mr. Burns
Pastimes of boys

6 **Providing feedback.** Write the correct possessive form on the transparency as students finish each example. Wait for students to finish (all heads up) before providing the answer for the next example. Probe for complete understanding by asking for the rule. Allow 30 minutes for differentiated autotutorial practices exercises for high-, middle-, and low-performance learners.

7 **Assessing the behavior.** Use the exercise on page 87 of the workbook to assess student understanding. In addition, use ordered turns recitation until about 90% correct responses are attained. Include 10 possessives on the unit test that require the application of Rule 1 and Rule 2.

CULTURALLY RESPONSIVE DIRECT INSTRUCTION

We have seen that a task-oriented teacher maximizes content coverage and gives students the greatest opportunity to learn. Likewise students who are involved in, acting on, and otherwise thinking about the material being presented have the greatest opportunity to learn. The key to bringing together these two important dimensions of effective teaching—task orientation and student engagement—rests with how you interact with

your students to invoke a willingness to respond and apply what they have been learning. In classrooms where the range of individual and cultural differences is great, engaging students in the learning process during direct instruction can be a major challenge to achieving performance outcomes.

One facet of research dealing with cultural diversity and student engagement that can help bridge the gap has focused on differences in fluency and oral expression among learners during presentation–recitation (Delpit, Boyd, Brock, & Rozendal, 2003). For example, *fluency,* or quickness to respond, can be influenced by nurturing and expressive qualities of the teacher (Lustig & Koester, 2009). The implication is that student hesitancy in responding and becoming engaged in the learning process may, for some cultural groups, be more a function of the attitude and cultural style of the teacher than of student ability. Also body posture, language, and eye contact form a pattern of **metacommunication** that is recognized by the learner and acted on according to the message being conveyed, intentionally or not (Chen & Starasta, 2005). For example, a formal body posture and questions posed in an expressionless voice, without eye contact, may not invoke a commitment to respond. In other words, teachers must convey a sense of caring about learners before engagement can take place. Engagement techniques alone (e.g., presenting and structuring, guiding student practice, and providing feedback and corrections) will not be sufficient to actively engage students in the learning process, unless these techniques are accompanied by the appropriate metacommunication expressing nurturance and caring.

Bowers and Flinders (1991) suggest several ways teachers can promote student engagement by conveying a sense of nurturance and caring:

- Use appropriate examples to clarify concepts and model performance. ("Let me give you an example that will help you see the relationship.")
- Accept the student's way of understanding new concepts. ("That's an interesting answer. Would you like to tell us how you arrived at it?")
- Reduce feelings of competitiveness. ("Today those who want to can work with a partner on the practice exercise.")
- Increase opportunities for social reinforcement. ("If you like, you can ask someone sitting nearby how he or she worked the problem.")
- Facilitate group achievement. ("When you're finished with your work, you can join another group to help them solve the problem.")
- Use and expect culturally appropriate eye contact with students. ("Amanda, I'm going to sit down next to you and watch you work the first problem.")
- Recognize longer pauses and a slower tempo. ("Take your time. I'll wait for you to think of an answer.")
- Respond to unique or different questions during a response. ("You're asking about something else. Let me give you that answer, and then we'll go back to the first question.")
- Balance compliments and reinforcement equally. ("Let's not forget that both Angel and Damon got the right answer but in different ways.")

Although much still needs to be known about cultural diversity and student engagement during direct instruction, one thing is clear: Students of any culture are more likely to engage expressively in the learning process in an atmosphere that (1) emphasizes the importance of unique learner responses, (2) reduces feelings of individual competitiveness, (3) promotes a multisensory (e.g., telling as well as performing) learning environment, (4) encourages social reinforcement and peer interaction, and (5) conveys a sense of nurturance and caring.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 7 content. After reading the case history, go to Chapter 7 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Mrs. Martinez teaches fifth grade to a class of 28 students. Recent standardized test scores at the school have been low, particularly in language and reading. Over one-half the class ranked in the lowest one-third of national norms in last year's test in either the reading or language portion. The school is making a strong effort to upgrade these skills.

Mrs. Martinez is in the middle of a lesson on teaching the appropriate use of *there, they're,* and *their.* The three words are written on the board in the following way:

There	**They're**	**Their**
a place	short for "they are"	shows ownership

She points to the first word and spells it. "T-H-E-R-E. I mean a place when I say this word. I might say, 'Put the book over there.' T-H-E-R-E. I mean a specific place.

"Also take away the *t*" [Mrs. Martinez covers the letter *t* of *there*], "and you have *here.* That's another clue: *here* and *there. Here* and *there,*" she repeats, this time pointing to her desk for *here* and to a desk in the middle of the room for *there.*

"Juan, give me another sentence that uses *there* to mean a place."

Juan: I want to go out there. [He looks out the window toward the baseball diamond.]

Mrs. Martinez: Spell your word correctly.

Juan: T-H-E-R-E.

Mrs. Martinez: Well done. Susan, what is the little word inside that is our clue?

[Susan doesn't answer and looks confused. Mrs. Martinez goes to the board and covers the *t* of *there* to expose *here.*]

Susan: Here, H-E-R-E. [Mrs. Martinez points to her desk and then to a more distant desk. At first, Susan says nothing. Mrs. Martinez gestures again.] Oh, *here* and *there, here* and *there.*

Mrs. Martinez: You're good at getting clues, Susan. I bet you'd be a good detective. Now let's look at the next word. They're—T-H-E-Y-'-R-E. It sounds the same as our first word, but it means something very different. T-H-E-Y-'-R-E is not a place; it's a short way to combine two words, *they* and *are.* The apostrophe [here she points appropriately to the board] stands for the letter *a* that we have taken out. "They are my friends." Say it fast and it becomes, "They're my friends." Matt, give us a sentence using our second word, T-H-E-Y-'-R-E.

Matt: [Matt is a high-performing student whose attention has been on a baseball game going on outside.] Their team can't even hit the ball.

Mrs. Martinez: Is Matt using our second word, T-H-E-Y-'-R-E, the one that is short for *they are*? What do you think, Parish?

Parish: No, he should have said, "They're not able to hit the ball." T-H-E-Y-'-R-E, short for *they are.*

Mrs. Martinez: Good, Parish. You even managed to keep the meaning of the sentence Matt used. [She pauses and walks slowly to the window.] Is Mr. Heath's class really that bad? Then I know we can beat them in next week's homeroom challenge.

SUMMING UP

The key terms and main points in this chapter include the following:

Categories of Teaching and Learning

1. Two broad classifications of learning are facts, rules, and action sequences (Type 1) and concepts, patterns, and abstractions (Type 2).
2. Type 1 outcomes generally represent behaviors at the lower levels of complexity in the cognitive, affective, and psychomotor domains; Type 2 outcomes frequently represent behaviors at the higher levels of complexity in these domains.
3. Type 1 teaching activities require combining facts and rules at the knowledge and comprehension level into a sequence of actions that can be learned through observation, rote repetition, and practice. Type 1 outcomes have correct answers that can be learned by memorization and practice.
4. Type 2 teaching activities go beyond facts, rules, and sequences to help the learner create, synthesize, identify, and recognize an answer that cannot be easily modeled or memorized. Type 2 outcomes may have many correct answers.
5. The learning of facts, rules, and action sequences is most commonly taught with teaching strategies that emphasize knowledge acquisition; the learning of concepts, patterns, and abstractions is most commonly taught with teaching strategies that emphasize concept learning, inquiry, and problem solving.
6. The acquisition of facts, rules, and action sequences is most efficiently achieved through a process known as the *direct instruction model.* This model is primarily teacher centered. Facts, rules, and action sequences are passed on to students in a presentation–recitation format, involving large amounts of teacher talk, questions and answers, review and practice, and the immediate correction of student errors.

Introduction to Direct Instruction Strategies

7. The direct instruction model is characterized by full-class (as opposed to small-group) instruction; by the organization of learning based on questions posed by you; by the provision of detailed and redundant practice (that may be supplemented by computer software); by the presentation of material so learners master one new fact, rule, or sequence before the teacher presents the next; and by the formal arrangement of the classroom to maximize drill and practice.
8. Direct instruction is most appropriate when the content in texts and workbooks does not appear in appropriately sized pieces, when your active involvement in the teaching process is necessary to arouse or heighten student interest, and when the content to be taught represents task-relevant prior knowledge for subsequent learning.

Daily Review and Checking the Previous Day's Work

9. Techniques for daily review and checking include the following:
   - Have students identify difficult homework problems in a question-and-answer format.
   - Sample the understanding of a few students who are likely to represent the class.
   - Explicitly review the task-relevant prior learning required for the day's lesson.

Presenting and Structuring

10. Techniques for presenting and structuring new content include these:
    - Establishing part–whole relationships
    - Identifying sequential relationships
    - Finding combinations of relationships
    - Drawing comparative relationships

Guided Student Practice

11. Techniques for guided student practice include the following:
    - Asking students to respond privately and then be singled out for help
    - Calling on students to respond whether or not their hands are raised
    - Preparing questions beforehand and randomly asking students to respond

Feedback and Correctives

12. Providing appropriate feedback and correctives involves knowing how to respond to answers that are (1) correct, quick, and firm; (2) correct but hesitant; (3) incorrect due to carelessness; and (4) incorrect due to lack of knowledge.
13. For a correct, quick, and firm response, acknowledge the correct response and either ask another question of the same student or quickly move on to another student.
14. For a correct but hesitant response, provide a reinforcing statement and quickly restate the facts, rules, or steps needed for the right answer.
15. For an incorrect response due to carelessness, indicate that the response is incorrect and quickly move on to the next student without further comment.
16. For an incorrect response that is due to a lack of knowledge, engage the student in finding the correct response with hints, probes, or a related but simpler question.
17. For most learning involving knowledge acquisition, the steps between successive portions of your lesson should be made small enough to produce approximately 60% to 80% correct answers in a practice and feedback session.
18. Reviewing, reexplaining, and prompting are effective until approximately 80% of your students respond correctly; after that, correctives should be made briefer or students should be guided to individualized learning materials.

Independent Practice

19. Design independent practice so the learner puts together facts and rules to form action sequences that increasingly resemble applications in the real world. Provide opportunities for independent practice as soon after the time of learning as possible.

Weekly and Monthly Reviews

20. Pace instruction so student responses to questions posed in weekly and monthly reviews are correct, quick, and firm about 95% of the time.
21. Use independent practice and homework to raise the percentage of correct responses from approximately 60% to 80% during guided practice and feedback to approximately 95% on weekly and monthly reviews.

Culturally Responsive Direct Instruction

22. Student engagement in the culturally diverse classroom is promoted by accepting unique learner responses, reducing competitiveness, promoting peer interaction, and conveying a sense of nurturance and caring.

KEY TERMS

Active responding, 240
Daily review and checking, 230
Direct instruction, 223
Feedback and correctives, 238
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Mastery learning, 226
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Presenting and structuring, 231
Rule-example-rule order, 234
Social learning theory, 236
Verbal prompts, 235
Weekly and monthly reviews, 243

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. Identify the learning outcomes associated with Type 1 and Type 2 teaching strategies. To what levels of behavior in the cognitive domain does each type of learning apply?

*2. What type of learning outcomes are elicited by instructional strategies that emphasize knowledge acquisition? What type of learning outcomes are elicited by instructional strategies that emphasize inquiry or problem solving?

*3. If you were to describe the direct instruction model, what characteristics would you include?

*4. Provide some examples of action verbs in the cognitive, affective, and psychomotor domains that describe the type of outcomes expected from the direct instructional model. Which outcomes do you think would be hardest to achieve?

*5. For what instructional goals is the direct instruction model most appropriate? What other goals can you think of that are not cited in the chapter?

*6. Explain why providing guided student practice in a nonevaluative atmosphere is important for learning to occur. What would you do to encourage a reluctant student to make a first, crude response?

7. The following second-grade student responses were received by a teacher in response to the question "What does 5 plus 3 equal?"

Brooke: It could be 8.
Juan: 9.
Jason: 53.
Ashley: 8.

Provide an appropriate teacher prompt that moves each student closer to the correct or more confident answer.

8. The following tenth-grade student responses were received by a teacher who asked, "What was one of the underlying reasons for the Civil War?"

Tahnee: The South wanted the land owned by the North.
Akim: I read somewhere it was religious persecution.
Ken: Well, let me think . . . It had something to do with slavery.
Tracy: The economics of the South.

Provide an appropriate teacher prompt that moves each student closer to the correct or more confident answer.

*9. What approximate percentage of correct answers should you work toward in a practice and feedback session? How would you change your instructional approach if only 30% of your student responses were correct in a practice and feedback session?

*10. What is the primary purpose of independent practice in direct instruction? Choose a lesson in your teaching area, and show how you would use independent practice to fulfill this purpose. How would you vary the independent practice if more time and opportunity for practice became available?

*11. When circulating around the room to monitor independent practice, in what ways could you make your monitoring time more efficient?

*12. Approximately what percentage of student responses during weekly and monthly review sessions should be correct, quick, and firm? What percentage would prompt you to reconsider your teaching approach to this content?

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B.

*1. From your fieldwork or observation, in what ways have you seen teachers review and check the previous day's work? Which ways do you feel would be the most appropriate for your classroom?

*2. Identify techniques you have observed teachers use for structuring content into small, bite-sized pieces. Which technique do you think most naturally fits the way the subject matter you will teach is organized?

*3. After observing direct instruction, describe methods you have observed for prompting a student to attain the correct response. Provide examples of prompts you would give a student after providing a wrong or partially wrong response in your teaching area. Indicate both the student's incorrect answer and your response.

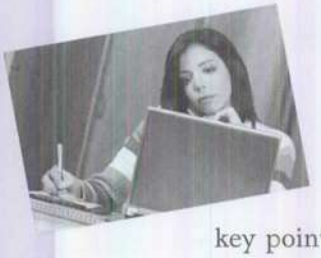
*4. For a subject you will teach, describe a cycle of weekly and monthly reviews (for example, daily checks for understanding, weekly reviews, and comprehensive reviews monthly) that you would like to implement in your classroom to increase the percentage of students who respond correctly, quickly, and firmly. What might you change if your reviews were not affecting student achievement and unit outcomes as you had anticipated?

Digital Portfolio Activities

The following digital portfolio activities relate to INTASC principles 1, 3, and 4.

1. For Field Experience and Practice Activity 3, you were asked to describe methods you have observed for prompting a student to achieve the correct response. Place your descriptions of these methods with those indicated in this chapter in a folder titled "Direct Instruction" and add them to your digital portfolio. This information will remind you of the many ways you can move a student closer to a correct answer without embarrassing him or her or expecting a response that he or she may be unable to provide at the time.
2. For Field Experience and Practice Activity 4, you were asked to describe a cycle of weekly and monthly reviews for raising the percentage of your students' responses that are correct, quick, and firm during direct instruction. Now add to your response what other instructional strategies (for example, independent practice and homework) you might use to raise the percentage of correct responses from approximately 60% to 80% during daily guided practice and feedback to approximately 95% of responses that are correct, quick, and firm on weekly and monthly reviews. Place your description in your "Direct Instruction" folder, and add it to your digital portfolio. This will remind you during unit planning how you can increase student engagement in your lessons and build momentum that keeps students focused on achieving unit outcomes.

Classroom Observation Activities



The following classroom observation activities relate to INTASC principles 1 and 4.

1. You learned in this chapter that reviewing or summarizing means more than just calling attention to the end of a lesson. Reviews and summaries can and many times do go beyond a simple repetition of the facts as they were presented. If you can identify key points, a code or symbol system for helping learners retain the content, and/or a generalization that integrates different parts of the lesson, you have

observed an effective review. For this observation activity, go to Chapter 7 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 7.1, titled Observing Lesson Reviews. Use this form to observe a lesson to note whether the following things were done:

1. Key points were included in a review, in which the teacher reiterated the most important content presented.
2. The teacher reorganized the content, indicating how it should be stored and remembered and sometimes providing students a memory-aiding code or symbol system, by which the content of the lesson could be more easily stored and recalled for later use.
3. The teacher consolidated the content by summarizing or touching on only the most general elements of the lesson, providing students with an opportunity to fill in any missing gaps about the main features of the lesson.

2. To complete this observation activity, go to Chapter 7 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 7.2. This Checklist for Observing Direct Instruction lists some of the most important dimensions of direction instruction. Place this scale in your "Direct Instruction" folder to use when you have the opportunity to observe and assess a direct instruction lesson.

8

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. What is concept learning?
2. What is inquiry learning?
3. What is problem-based learning?
4. What are constructivist strategies for teaching?
5. What are some ways of promoting the goals of concept learning, inquiry, and problem solving in a heterogeneous classroom?

INTASC

- principle 1 The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students.
- principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.
- principle 3 The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.
- principle 4 The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
- principle 6 The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

Teaching Strategies for Indirect Instruction

Chapter 7 introduced you to direct instruction for teaching facts, rules, and action sequences. Now we consider indirect instruction for teaching concepts, inquiry, and problem solving.

An old adage says, "Tell me and I forget. Show me and I remember. Involve me and I understand." The teaching of concepts, inquiry, and problem solving involves different forms of indirect instruction that actively involve your learners in seeking resolutions to questions and issues while they construct new knowledge. Indirect instruction *is an approach to teaching and learning in which (1) the process is inquiry, (2) the content involves concepts, and (3) the context is a problem.*

These three ideas are brought together in special ways in the indirect instruction model. This chapter presents teaching strategies you can use to compose your own indirect teaching approach that asks your learners to share the excitement of becoming actively involved in their own learning and contributing new knowledge to solve real-world problems. We begin by looking into two classrooms; one in which Tim Robbins is teaching a lesson with the direct instruction model and one in which Kay Greer is teaching the same lesson with the indirect instruction model.

It is the third 6 weeks of the fall semester, and Tim Robbins is teaching a unit on fractions to his fourth-grade class. During the first 12 weeks of the year, all fourth-graders learned about the concepts of *numbers* and *number theory.* They covered such topics as odd, even, positive, and negative numbers. The fourth-graders have also become familiar with such numerical concepts as *multiples, factors,* and the *base 10 system* for writing numbers.

On this day, we observe Mr. Robbins. He is teaching a lesson on equivalent fractions as a way of representing the same amount. During the preceding four lessons, his learners have studied about fractions as quantities and learned how fractions that look different (e.g., $\frac{1}{2}$, $\frac{2}{4}$) actually represent the same amount. The present lesson is intended to reinforce this idea.

Mr. Robbins begins the lesson with a quick review of the previous lesson. On the overhead projector, he shows pictures of objects such as pies and loaves of bread divided to represent different fractions of the whole. In rapid-fire fashion, his learners call out the fractions. He then projects a chart with undivided whole objects and has learners come up and divide them into halves, thirds, fourths, and so on; other learners do the same on worksheets. Each learner gets immediate feedback on his or her answers.

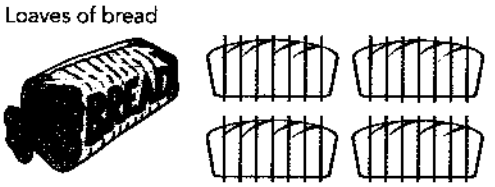
Next Mr. Robbins signals the class to clear their desks except for a pencil and draws their attention to a large, brightly colored chart hanging on the front blackboard. (The chart is shown in Figure 8.1.) He passes out copies of the same chart to students. Mr. Robbins explains that for each row, students are to complete the fraction with a denominator of 100 that equals the fraction in the row. Then they are to fill in the third square with the decimal equivalent of that fraction.

Mr. Robbins first models how to do this. He demonstrates (pointing out that students have already learned this) how to make an equivalent fraction by multiplying the original fraction by a fraction that equals 1. He works several examples to be sure his students understand the concept and then has them copy the examples onto their chart.

Figure 8.1 Mr. Robbins's Chart for Teaching Fractions

$\frac{1}{4} \times \frac{25}{25}$	$\frac{25}{100}$	.25
$\frac{1}{2} \times \frac{\quad}{50}$	$\frac{\quad}{100}$	.
$\frac{1}{5} \times$	$\frac{\quad}{100}$	.
$\frac{2}{5}$	$\frac{\quad}{100}$	.
$\frac{3}{4}$	$\frac{\quad}{100}$	.
$\frac{5}{4}$	$\frac{\quad}{100}$	.
$\frac{3}{2}$	$\frac{\quad}{100}$	.

Figure 8.2 Frank's Drawing



Mr. Robbins then calls on several students to come to the front of the room and demonstrate several more examples for the class. He has the students state as they work, for the class to hear, how they are solving the problems. He checks that the rest of the students correctly fill in the charts at their desks.

Finally, Mr. Robbins breaks the class into small groups and directs them to fill out the remainder of the chart. He provides each group with a key so they can immediately check their responses when finished. As the learners busily engage in their seatwork, Mr. Robbins moves from group to group, checking, giving feedback, correcting, or praising as needed. He has designed this lesson to show that fractions that look different can be equal in order to point out the relationship of decimals and fractions and to use this as a foundation for teaching the relationships between dollars, decimals, and fractions in a subsequent lesson.

In the classroom next door to Mr. Robbins, Kay Greer also is teaching a unit on fractional equivalents.* As the lesson begins, Mrs. Greer asks Denisha to tell the class what she said yesterday about fractions. "A fraction like isn't a number," she asserts, "because it isn't on the number line." Denisha points to the number line running along the top of the front blackboard. "See! There's no $\frac{1}{2}$. Just 1, 2, 3, 4, . . . like that!"

"Well, class, let's think about what Denisha says. Let me give you a problem, and we'll study it and then maybe come to some conclusion about if a fraction is a number." Mrs. Greer turns on the overhead and projects the following for all to see:

> A boy has four loaves of bread that he bought at the local supermarket. He has eight friends, and he wants each friend to get an equal part of the bread. How much bread should he give each of his friends?

Mrs. Greer draws the four loaves on the overhead and watches as the children, arranged in six groups of five, copy the drawings into their notebook. She walks around the classroom, occasionally prompting groups with the question "How much bread is each one going to get?"

The children argue among themselves: "You can't do it!" "There isn't enough bread!" "How many slices are in each loaf?" After about 10 minutes, Mrs. Greer asks, "Does anyone need more time to work on this? How many are ready to discuss?"

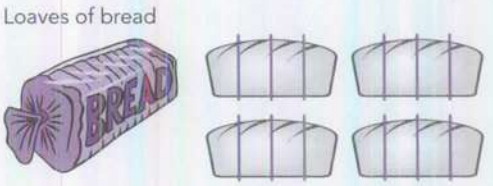
A few raise their hands. The rest are busy drawing and redrawing loaves of bread, sketching lines across them. Several minutes go by and Mrs. Greer says, "OK, would someone like to show his or her solution?"

Frank raises his hand, walks to the overhead, and draws his solution. "I'm not sure it's right," he hedges. Frank draws four loaves of bread and divides each loaf into eight slices. (Frank's drawing appears in Figure 8.2.) He looks up and announces to the class, "Each friend gets four slices!"

"That's wrong!" challenges Rosa. "Each friend gets two slices, see?" She walks to the overhead, draws four loaves of bread, and divides each loaf into four slices. (Rosa's drawing appears in Figure 8.3.) "Each friend gets two slices," she asserts, pointing to the equal portions.

*Information from D. L. Ball (1991), "Teaching Mathematics for Understanding: What Do Teachers Need to Know About Subject Matter?" in M. L. Kennedy (Ed.), *Teaching Academic Subjects to Diverse Learners* (pp. 67–69). New York: Teachers College Press.

Figure 8.3 Rosa's Drawing



"Why not just give each friend half a loaf?" asks Albert.

"Come up here and draw your solution," says Mrs. Greer. Albert walks up to the overhead and sketches his proposal to the class. "Can you write the number that each gets?" she asks. Albert writes the number $\frac{1}{2}$ on the board.

"Well, Albert's and Rosa's slices are bigger than mine," protests Frank.

"Frank," asks Mrs. Greer, "why not write the number that shows how much of the bread your eight friends get? Albert's number is $\frac{1}{2}$. How much is one slice as Albert sees it?" she asks the class.

"One-eighth," proposes Cal.

"Can you write that?" inquires Mrs. Greer. Cal comes up to the overhead and writes $\frac{1}{8}$ next to Frank's drawing.

As children write different numbers for their solutions, Mrs. Greer asks, "Well, how can we have three different numbers for each of these solutions? We have one half, two-fourths, four-eighths," pointing to the different quantities and fractions on the overhead.

After several moments of silence, several hands shoot up, and one by one, the children give explanations for the seeming discrepancy.

The lesson continues in this vein until 5 minutes before the bell. Then Mrs. Greer reviews what was concluded and sets the goal for the next lesson on fractions.

Now let's compare the lessons of Mrs. Greer and Mr. Robbins. Both teachers have the same goal: to help learners understand the concepts of *quantity* and *equivalence* pertaining to fractions. But they have designed two very different lessons to achieve this same end.

You may have noticed that the direct instruction approach has heavily influenced Mr. Robbins's lesson. He has designed his lesson to elicit a minimum of mistakes. His activities elicit practice of correct responses followed by immediate feedback. For Mr. Robbins, learning involves correct responding, which is best accomplished by a teacher-directed or teacher-centered lesson.

Mrs. Greer, in contrast, has a less direct approach to learning. She is less focused on correct, rapid responses than on thought processes involving concepts, inquiry, and problem solving. Her lesson takes into consideration that her learners already have information and beliefs about fractions that may or may not be correct. Mrs. Greer wants to expose students' misconceptions and challenge them to acquire new, more accurate perceptions through their own powers of reasoning. She carefully avoids providing answers. Her objective is to help learners understand fractions by influencing the cognitive processes by which they can elicit correct responses. Let's look at some of the cognitive processes around which she planned her lesson.

THE COGNITIVE PROCESSES OF LEARNING

Cognitive psychologists have identified three essential conditions for meaningful learning (Anderson, 2005; Mayer, 1987, 2002): *reception, availability,* and *activation.* The reception and availability conditions are met when teachers focus their learners' attention on a problem and provide a framework or structure that organizes the content into meaning-

ful parts, called an *anticipatory set* (Hunter, 1982; Serdyukov & Ryan, 2007) or **advance organizer** (Ausubell, 1968). Teachers fulfill the activation condition by modeling the inquiry process and using skilled questioning techniques. As learners develop greater skill at inquiry and problem solving, the teacher gradually fades assistance and allows learners to assume more and more responsibility for their own learning.

As you may recall, supporting this approach to learning and instruction is a theory called **constructivism.** Constructivist lessons are designed and sequenced to encourage learners to use their own experiences to actively construct meaning that makes sense to them, rather than to acquire understanding through exposure to a format exclusively organized by the teacher (Fosnot, 2005; Llewellyn, 2002; Richardson, 1997). By reflecting on their own experiences, students may change what they believe, discard old information and accept new information, and question, explore, and assess what they know.

For example, groups of students in a social studies class are discussing problems related to pollution and what needs to be done about them. The teacher focuses on helping students to refocus their questions in ways that will lead to practical solutions. She encourages each student to reflect on his or her current experiences with pollution. When one student comes up with a concept that links various forms of pollution and points to a single source, she seizes on it to alert the class to this important contribution, which will be a promising direction to explore. She encourages the students to consult the Web and other sources to substantiate their hypotheses and the credibility of their proposed solutions. Afterward, the class talks about what they have learned and how their observations and documentation helped them to understand the concept of *pollution.*

From examples like these, constructivists believe that knowledge results from the individual constructing reality from her or his own experiences. Learning occurs when learners create new rules and hypotheses on their own to explain what is being observed. The need to create new rules and formulate hypotheses is stimulated by classroom dialogue, problem-solving exercises, and individual projects and assignments that create discrepancies, or an imbalance, between old knowledge and new observations. Teachers use direct experience (Piaget, 1977; Stepien, 2002), problem- and project-based learning (Boss, Krauss, & Conery, 2008; Markham, Mergendoller, Larmer, & Ravitz, 2003), and social interaction (Kumpulainen, 2001; Vygotsky, 1962) to restore the balance while deemphasizing the roles of lecturing and telling. Table 8.1 identifies some of the ways a constructivist classroom differs from a traditional classroom.

Many changes in how reading, writing, mathematics, science, and social studies are taught have followed constructivist thinking and the indirect instructional strategies that support it (Chaille, 2007; Fosnot, 2005). Let's look at some instructional strategies in these areas that have followed constructivist thinking.

Reading

For most of the 20th century, reading curricula have taught the skills of decoding, blending, sequencing, finding main ideas, and so on outside the context of reading itself. These skills were usually practiced with contrived stories written in basal readers. Constructivist-influenced reading curricula now teach basic reading skills with a balanced approach, such as through the reading of literature while engaged in a search for meaning. Learners often work in small groups, cooperatively reading to one another and asking and answering questions based on extended reading assignments. Fact-oriented worksheets are deemphasized.

Writing

Constructivist-oriented approaches to writing instruction provide a problem-solving context by focusing learners' attention on the importance of communication. They practice writing skills not in isolation but while working on writing activities that require them to communicate ideas meaningfully to real audiences. From learners' very earliest at-

Table 8.1 A Constructivist Classroom Compared to a Traditional Classroom

Traditional Classroom	Constructivist Classroom
The curriculum begins with the parts of the whole and emphasizes basic skills.	The curriculum emphasizes big concepts, beginning with the whole and expanding to include the parts.
Strict adherence to a fixed curriculum is highly valued.	Pursuit of student questions and interests is valued.
Materials are primarily textbooks and workbooks.	Materials include primary sources of information and manipulative materials.
Learning is based on repetition.	Learning is interactive, building on what the student already knows.
Teachers disseminate information to students; students are recipients of knowledge.	Teachers have a dialogue with students, helping them construct their own knowledge.
The teacher's role is directive and rooted in authority.	The teacher's role is interactive and rooted in negotiation.
Assessment is through testing; correct answers are the desired product.	Assessment includes student works, observations, and points of view, as well as tests. The process is as important as the product.
Knowledge is seen as inert.	Knowledge is seen as dynamic and ever changing with our experiences.
Students work primarily alone.	Students work primarily in groups.

Source: Concept to Classroom: A Series of Workshops. 2004 Educational Broadcasting Corporation. Available online at www.thirteen.org/edonline/concept2class/constructivism/index.html.

tempts at writing, they realize that someone will read what they write. Thus what they write must be understandable. Writing instruction, then, involves a process of developing an initial draft and then revising it under the conditions that would prevail in the real world (e.g., over extended timeframes, with access to resources, with feedback from peer readers).

Mathematics and Science

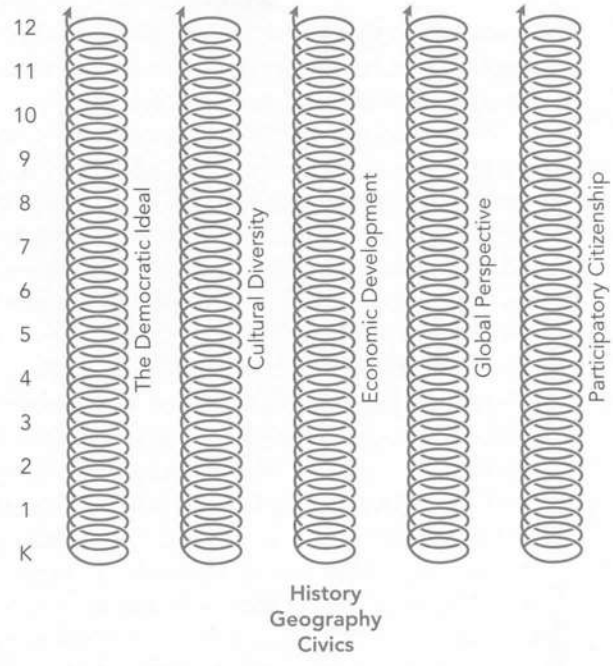
Authentic problems, such as the one presented in the dialogue with Mrs. Greer at the beginning of this chapter, are the focus of constructivist approaches to math and science instruction. In such approaches, little time is spent on the rote drill and practice of individual math or science facts. Rather students are taught within a problem-solving or application context from the very beginning. The teacher attempts to have learners become actively involved in exploring, predicting, reasoning, and conjecturing, so that facts become integrated into mathematical skills and strategies that can be applied to authentic real-world problems.

Many authentic math and science problems for grades 6 through 12 are becoming available on the Internet. They provide learners the opportunity for real-time problem solving, interactivity, and connectivity with other resources. For examples of online K–12 constructivist math and science curricula, visit www.internet4classrooms.com/math_gen.htm and www.goENC.com.

Social Studies

Constructivist approaches to social studies have the goal of helping learners acquire a rich network of understandings around a limited number of topics. Parker (1991) advocates that the K–12 social studies curriculum should focus on five essential elements: the democratic ideal, cultural diversity, economic development, the global perspective, and participatory

Figure 8.4 Five Essential Learnings Spiral Upward through Each Grade to Form an Integrated Body of Knowledge



Source: From *Renewing the Social Studies Curriculum* (p. 2), by W. Parker, 1991. Alexandria, VA: ASCD. Copyright 1991 by ASCD. Reprinted with permission.

citizenship. The blending of these critical elements within a single curriculum requires a constructivist view of teaching and learning that promotes the following:

1. *In-depth study*—the sustained examination of a limited number of important topics
2. *Higher-order challenge*—the design of a curriculum and instruction that requires students to gather and use information in nonroutine applications
3. *Authentic assessment*—aligning students' schoolwork with performance-oriented exhibitions of learning

These subject-matter advances assume that students construct their own understanding of skills and knowledge, rather than have it told or given to them by the teacher (Sunal & Haas, 2007). Therefore constructivist lesson plans do the following:

- Present instructional activities in the form of problems for students to solve
- Develop and refine students' answers to problems from the point of view and experience of the student
- Acknowledge the social nature of learning by encouraging the interaction of the teacher with students and students with one another

Another goal of constructivist teaching is to present **integrated bodies of knowledge.** Integrated units and lessons stress the connections between ideas and the logical coherence of interrelated topics, usually in the form of interdisciplinary or thematic units of instruction (Roberts & Kellough, 2006; Ross, 2006; Wiggins & McTighe, 1998). Figure 8.4 shows this approach to the social studies curriculum suggested by Parker (1991). Following the constructivist approach, the teacher presents authentic problems using the interaction and naturally occurring dialogue of the classroom to foster integrated bodies of knowledge. Let's see how this is done using the indirect model of instruction.

COMPARING DIRECT AND INDIRECT INSTRUCTION

Direct instruction strategies are best suited for the teaching of facts, rules, and action sequences, so it makes sense that indirect instruction strategies are best suited for teaching concepts, inquiry, and problem solving.

When you present instructional stimuli to your learners in the form of content, materials, objects, and events and ask them to go beyond the information given to make conclusions and generalizations or find a pattern of relationships, you are using the indirect model of instruction. *Indirect* means the learner acquires a behavior indirectly by transforming, or constructing, the stimulus material into a meaningful response that differs from both (1) the content used to present the learning and (2) any previous response given by the student. Because the learner can add to the content and rearrange it to be more meaningful according to his or her experience, the elicited response can take many different forms. In contrast to the outcomes of direct instruction, there is rarely a single best or correct answer when using the indirect model of instruction. Instead the learner is guided to an answer that goes beyond the specific problem or content presented.

If direct instruction is so effective for teaching facts, rules, and action sequences, you might wonder why it is not used for teaching concepts, inquiry, and problem solving. The answer is that not all desired outcomes call for responses that are identical to the content taught. Direct instruction is limited to (1) learning units of the content taught so they can be remembered and (2) composing parts of the content learned into a whole, so that a rapid and automatic response can occur.

Learning at the lower levels of the cognitive, affective, and psychomotor domains relies heavily on these two processes. Both can be placed into action by content that closely resembles the desired response (e.g., "Look at this word and then say it," "Watch me form a possessive, and then you do the next one," "Read the instructions, and then focus the microscope."). The desired response need not go much beyond what is provided. The task for the learner is simply to produce a response that mirrors the form and content of the stimulus. A great deal of teaching involves these simple processes. For it, the direct instruction model is most efficient and effective.

Real-world activities, however, often involve analysis, synthesis, and decision-making behaviors in the cognitive domain, organization and characterization behaviors in the affective domain, and articulation and naturalization behaviors in the psychomotor domain. These behaviors complicate instruction, because they are not learned by memorizing the parts and rapidly and automatically reassembling them into a whole, as are behaviors at lower levels of complexity. Instead they must be constructed by the learner's own attempts to use personal experiences and past learnings to bring meaning to and make sense out of the content provided.

Lower-level behaviors are required to attain more complex behaviors, but much more is needed by both the teacher and learners before higher-order outcomes can be achieved. As you will see in this chapter, teaching for higher-order outcomes requires a different set of instructional strategies that represent the indirect instruction model.

TEACHING STRATEGIES FOR INDIRECT INSTRUCTION

Before describing the strategies that allow your learners to achieve higher-order outcomes, let's consider some topics that require higher-order outcomes.

Suppose you want your students to learn the following:

- Meaning of a number line (arithmetic)
- Concept of a quadratic equation (algebra)

- Process of acculturation (social studies)
- Meaning of contact sports (physical education)
- Workings of democracy (government)
- Playing of a concerto (music)
- Demonstration of photosynthesis (biology)
- Application of the law of conservation of energy (general science)

Learning these topics requires not just facts, rules, and action sequences but much more. If you teach just the facts, rules, and action sequences about the number line—"Here is the definition," "Here is how it is used," or "Follow this sequence of steps"—your students may never learn the concept that binds problems that require an understanding of the number line or how to use it in new or novel situations. Instead your students must learn to add to, rearrange, and elaborate on the content you present, using more complex cognitive processes. Let's consider how this is done.

Recall from Chapter 7 (Table 7.3) the distinction between Type 1 and Type 2 behaviors. Type 1 behaviors become Type 2 behaviors by using facts, rules, and sequences to form concepts, patterns, and abstractions. As we will see in this chapter, concepts, patterns, and abstractions are most effectively taught in the context of strategies that emphasize concept learning, inquiry, and problem solving.

Notice what would be required, for example, if students tried to learn the concept of a *frog* in the same way they acquired facts, rules, and action sequences about a frog. First, students would have to commit to memory all possible instances of frogs (of which there may be hundreds). Trying to retain hundreds of frog images in the same form they were presented would quickly overburden students' memories. Second, even after committing many types of frogs to memory, learners might confuse frogs with similar animals. The memorization process does not include the characteristics that *exclude* other animals from being frogs (e.g., has hard shell, dry skin, color changes, tail).

The processes of generalization and discrimination, if planned for in the presentation of your lesson, can help students overcome both of these problems. **Generalization** helps learners respond in a similar manner to stimuli that differ but are bound by a central concept, thereby increasing the range of instances to which particular facts, rules, and sequences apply (e.g., to all types of frogs). In addition, **discrimination** selectively restricts this range by eliminating things that appear to match the student's concept of a *frog* (e.g., a chameleon) but that differ from it in critical dimensions (e.g., has a tail).

Generalization and discrimination help students classify visually different stimuli into the same category based on critical attributes that act as magnets, drawing together all instances of the same type without requiring the learner to memorize all possible instances. The concept of a *frog*, then, becomes combined with other concepts to form larger patterns (e.g., amphibians) of increasing complexity. Figure 8.5 shows how concrete facts, rules, and sequences in a science curriculum (e.g., knowledge of elementary substances) must be combined with increasingly more abstract concepts and patterns (e.g., cellular forms, life functions, single-celled animals) to achieve higher-order outcomes (e.g., understanding of multicellular living things and life groups). As lesson and unit goals move up the hierarchy, the teacher must move from a direct to an indirect model of instruction.

It is apparent that both your role as teacher and your organization of content need to be different for the learning of concepts, patterns, and abstractions than for the learning of facts, rules, and sequences. Since the stimulus material presented to achieve higher-order outcomes cannot efficiently contain all possible instances of the concept to be taught, it must provide its most critical dimensions.

The indirect instruction model uses instructional strategies that encourage the cognitive processes required both to form concepts and to combine them into larger patterns and abstractions that promote inquiry and problem-solving skills. Figure 8.6 shows some of the indirect instruction strategies performed by a teacher using this model.

Figure 8.5 A Hierarchy of Abstraction Representing Possible Units of Instruction in a Science Curriculum

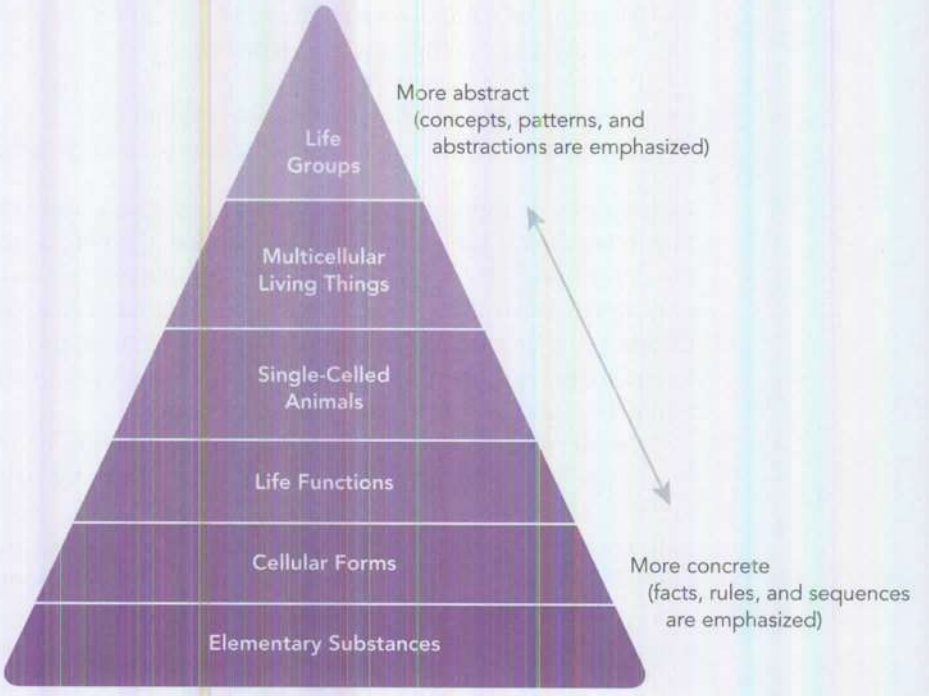


Figure 8.6 Some Indirect Instruction Strategies

1. *Content Organization:* Providing advance organizers that serve as "pegs" on which students
   - Hang key points
   - Focus learning in most productive areas
2. *Conceptual movement:* Induction and deduction using
   - Selected events to establish general concepts and patterns (induction)
   - Principles and generalizations that apply to specific events (deduction)
3. *Examples and nonexamples*
   - Introducing critical attributes that promote accurate generalizations
   - Gradually expanding a set of examples
   - Heightening discrimination with noncritical attributes
4. *Questions:* Raising questions that
   - Guide the search and discovery process
   - Present contradictions
   - Probe for deeper understanding
   - Point the discussion in new directions
   - Pass responsibility for learning to the student
5. *Learner experience* (Using student ideas): Encouraging students to
   - Use references from their own experience
   - Use examples to seek clarification
   - Draw parallels and associations
6. *Student self-evaluation*
   - Asking students to evaluate the appropriateness of their own responses
   - Providing cues, questions, and hints that call attention to inappropriate responses
7. *Discussion:* Promoting classroom dialogue that encourages students to
   - Examine alternatives
   - Judge solutions
   - Make predictions
   - Discover generalizations that encourage critical thinking

You can see from Figure 8.6 that indirect instruction is more complex than direct instruction. Classroom activities are less teacher centered. This brings student ideas and experiences into the lesson and lets students begin evaluating their own responses. Because the outcomes are more complex, so, too, are your teaching strategies. To build toward these outcomes, extended forms of reasoning and questioning may be required.

The indirect instruction strategies in Figure 8.6 were among those having the highest correlation with positive student attitudes toward learning in a study by Fielding, Kame'enui, and Gerstein (1983). These also are the teaching strategies thought to be most useful in providing behaviors that students will use in subsequent grades, outside school, and in their adult lives (Borich & Tombari, 2004; Tombari & Borich, 1999; Williams, 2003).

An Example of Indirect Instruction

Now let's observe a classroom lesson in which the teacher is using indirect instructional strategies. This dialogue reflects some facts, rules, and sequences that were taught previously, but the ultimate goal is the learning of concepts and the teaching of inquiry and problem solving. As you read, note the use of bold italic type to identify indirect instruction strategies from Figure 8.6.

This dialogue provides a glimpse into a government class where a lesson on different economic systems is in progress. The teacher gets the students' attention by asking if anyone knows what system of government in the world is undergoing the most change. Marty raises his hand.

Teacher: Marty?

Marty: I think it's communism, because the Soviet Union broke up and Russia instituted some democratic reforms.

Teacher: That's right, not unlike some countries in the Middle East that are also undergoing change. And because these changes will probably continue to affect all our lives in the years ahead, it may be a good idea to know what some different forms of government are and why some people choose to live or not live under them. To get us started, let me ask if anyone knows where the phrase "government of the people, by the people, for the people" comes from. [Rena raises her hand.] Rena?

Rena: From Lincoln's Gettysburg Address . . . I think near the end.

Teacher: That's right. Most nations have a similar statement that expresses the basic principles on which its laws, customs, and economics are based. Today we will study three systems by which nations guide and operate their economies. The three systems we will study are capitalism, socialism, and communism. They often are confused with the political systems that tend to be associated with them. A political system not only influences the economic system of a country but also guides individual behavior in many other areas, such as what is taught in schools, the relationship between church and state, how people are chosen for or elected to political office, and what newspapers can print. (***Content organization***)

For example, in the United States, we have an economic system that is based on the principles of capitalism—or private ownership of capital—and a political system that is based on the principle of democracy—or rule by the people. These two sets of principles are not the same, and in the next few days, you will see how they sometimes work in harmony and sometimes create contradictions that require changes in an economic or political system, like those occurring today in some countries around the world. (***Content organization***)

Today we will cover only systems dealing with the ownership of goods and services in different countries—that is, just the economic systems. Later I will ask you to distinguish these from political systems. Who would like to start by defining *capitalism*. What does the word *capitalism* mean to you? (***Questions***)

Robert: It means making money.

Teacher: What else, Robert?

Robert: Owning land . . . I think.

Teacher: Not only land, but . . . (***Probes for deeper understanding***)

Robert: Owning anything.

Teacher: The word *capital* means "tangible goods or possessions." Is a house tangible? (***Concept learning: deduction***)

Che-lim: Yes.

Teacher: Is a friendship tangible?

Che-lim: Yes.

Teacher: What about that, Mark? (***Asks student to self-evaluate***)

Mark: I don't think so.

Teacher: Why?

Mark: You can't touch it.

Teacher: Right. You can touch a person who is a friend but not the friendship. Besides you can't own or possess a person. So what would be a good definition of *tangible goods*?

Che-lim: Something you own and can touch or see.

Teacher: Not bad. Let me list some things on the board, and you tell me whether they can be called *capital*. [Writes the list.] (***Examples and nonexamples***)

car
stocks and bonds
religion
information
clothes
vacation

OK. Who would like to say which of these are *capital*? [Ricky raises his hand.] (***Concept learning: deduction***)

Ricky: Car and clothes are the only two I see.

Vanessa: I'd add stocks and bonds. They say you own a piece of something, although maybe not the whole thing.

Teacher: Could you see or touch it? (***Questions***)

Vanessa: Yes, if you went to see the place or thing you owned a part of.

Teacher: Good. What about a vacation? Did that give anyone trouble?

Mickey: Well, you can own it . . . I mean you pay for it, and you can see yourself having a good time. [The class laughs.]

Teacher: That may be true, so let's add one last condition to our definition of *capital*. You must be able to own it, see or touch it, and it must be durable—or last for a reasonable period of time. So now, how would you define *capitalism*? (***Concept learning: induction***)

Carey: An economic system that allows you to have capital—or to own tangible goods that last for a reasonable period of time. And I suppose, to sell the goods, if you wanted.

Teacher: Very good. Many different countries across the world have this form of economic system. Just to see if you've got the idea, who can name three countries, besides our own, that allow the ownership of tangible goods? (***Learner experience***)

Anton: Canada, Japan, and Germany.

Teacher: Good. In all these countries, capital, in the form of tangible goods, can be owned by individuals.

This dialogue illustrates one variation of the indirect model of instruction. Notice that this lesson used the naturally occurring dialogue of the classroom to encourage learners to bring their own experiences and past learning to the topic, rather than to acquire an understanding by having it presented to them in an already organized form. This lesson required learners to build an understanding of the topic collectively under the guidance of the teacher using one another's predictions, hypotheses, and experiences.

Look at Figure 8.6 again to review the teaching strategies used in indirect instruction. Now let's consider the extent to which this example lesson contains these key aspects of indirect instruction.

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Comparing the dialogues for direct and indirect instruction, what differences do you notice? Obviously, they differ in complexity. Teaching for more complex outcomes takes more time and planning. The extensive planning needed for higher-order learning is one of the most overlooked aspects of indirect instruction. With more expansive and complex content, the lesson must be introduced with a framework or structure that organizes the content into meaningful parts. This is the first step in planning for indirect instruction—organizing the content in advance.

One way of providing this framework to your learners is to use advance organizers (Ausubel, 1968; Borich & Tombari, 1997; Woolfolk, 2010). An *advance organizer* gives learners a conceptual preview of what is to come and helps prepare them to store, label, and package the content for retention and later use. In a sense, an advance organizer is a treelike structure with main limbs that act as pegs, or place holders, for the branches that are yet to come. Without these pegs on which to hang content, important distinctions can become easily blurred or lost.

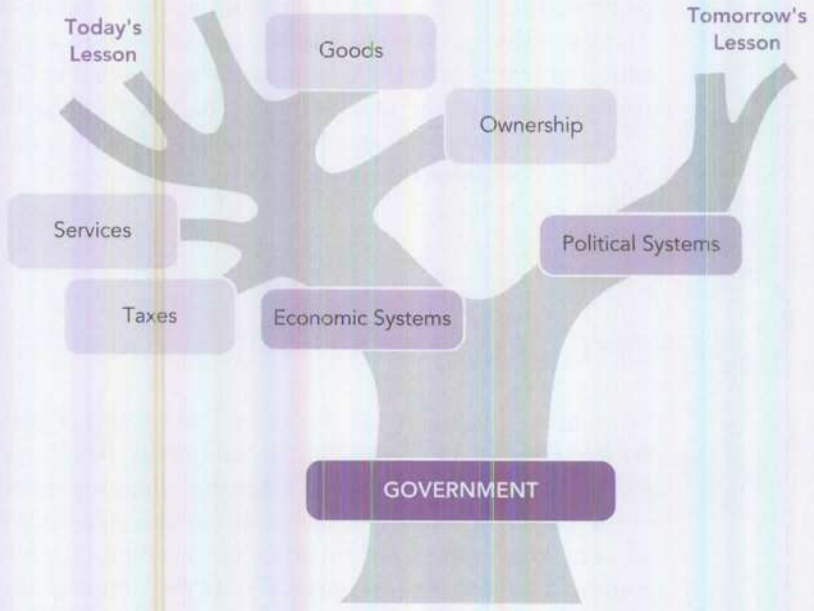
To reinforce these distinctions, Burnette (1999) recommends concluding a lesson or unit with the same advance organizer that introduced it, so students can better envision where instruction began and ended. Advance organizers have been found especially helpful for students from diverse cultures and for English-language learners when the organizer includes links between familiar concepts and the new content to be learned (Lustig & Koester, 2009; Saunders & Goldenberg, 1999; Saunders, O'Brien, Lennon, & McLean, 1999).

For example, recall that our lesson dialogue began with an introduction about coverage of the day's lesson. To set the stage, the teacher introduced two abstractions (economic systems and political systems), each comprising a complex network of concepts (*taxes, ownership, goods, services,* etc.). At the beginning of the lesson, the teacher alerted students to the reason for drawing such an early distinction between a political and an economic system ("Today we will study three systems by which nations guide and operate their economies . . . capitalism, socialism, and communism. They often are confused with the political systems that tend to be associated with them." Then the teacher says, "Today we will cover only . . . economic systems. Later I will ask you to distinguish these from political systems."). Figure 8.7 shows an advance organizer that this teacher might have used to open the lesson.

Advance organizers, especially for higher-order outcomes (e.g., application, analysis, synthesis, and evaluation), rarely use single words or phrases that enlighten students when merely uttered. Instead they are concepts woven into the lesson fabric to provide an overview of the day's work and all topics to which it will subsequently relate. Advance organizers can be presented orally or as charts and diagrams. Here are some examples of advance organizers:

- Showing a chart that illustrates the skeletal evolution of humans before the skeletal relationships among forms of animal life are presented (biology)

Figure 8.7 Advance Organizer for a Unit on Government



- Drawing examples of right, equilateral, and isosceles triangles before introducing the concept of a *right triangle* (math)
- Discussing the origins of the Civil War before describing its major battles (American history)
- Describing what is meant by a *figure of speech* before introducing the concepts of *metaphor* and *simile* (English)
- Listening to examples of both vowels and consonants before teaching the vowel sounds (reading)
- Showing and explaining the origins of rock formations before showing examples of igneous, metamorphic, and sedimentary rocks (science)

Notice that each of these examples presents a general concept into which fits the specific concept that is the subject of the day's lesson. This is not accomplished by reviewing earlier content, which often is confused with the idea of an advance organizer. Instead it is done by creating a conceptual structure—skeletal evolution, various triangular shapes, Civil War origins, figures of speech, the alphabet, the evolution of rock formations—into which you can place not only the content to be taught but also that for related lessons.

Therefore, these advance organizers set the groundwork for focusing the lesson topic. They prevent every lesson from being seen as something entirely new. Finally, they integrate related concepts into larger and larger patterns that later become more authentic unit outcomes (evolution, triangular shapes, determinants of Civil War, figures of speech). An advance organizer identifies the highest-level outcome to result from a lesson sequence and to which the present day's lesson will contribute. In our example dialogue, this higher-order outcome was to distinguish between economic and political systems—a distinction organized in advance by the teacher's introductory remarks and graphic representation.

But before you choose an advance organizer, you will want to decide how you will organize and structure the content you will teach. For this, you will want to consider the concept learning, inquiry learning, and problem-centered approaches to learning.

Concept Learning

If the goal of your lesson is concept learning, your instruction will want to emphasize the essential attributes that bind seemingly dissimilar data, materials, objects, or events. Here students are taught a concept by seeing examples and nonexamples of an object or event, from which they learn the essential attributes that separate seemingly like objects or events.

In Chapter 7, we saw an example of concept learning and an advance organizer by diagramming the essential attributes of a frog that separates it from look-a-likes (toads, turtles, chameleons, etc.). As the learner is given more practice with examples and nonexamples of frogs, he or she recognizes a tightly woven combination of essential attributes (e.g., skin is smooth and moist, not warty and dry, can't change color; no tail, strong hind legs; makes deep hoarse sound). Concept learning is the search for the glue that holds together similar items and the attributes that can be used to distinguish examples of a given group or category from nonexamples.

The steps in a concept-learning lesson include (1) identifying the essential and nonessential attributes of the concept that you will present to students, (2) selecting positive and negative examples that distinguish the essential from the nonessential attributes, and, with the participation of your students, (3) developing decision rules that define the essential attributes for defining the concept.

Here is an example of a concept-learning lesson: "Math Facts That Equal 10." For this lesson, the teacher does the following:

- Makes a list of both positive and negative examples of the concept *10* and writes the examples on flash cards (positive examples, such as 6 + 4, 12 - 2, 10 × 1, etc.; negative examples, such as 7 + 2, 15 - 4, 2 × 4, etc.)
- Writes the words *Yes* and *No* as column headings on the board
- Presents the first flash card, 6 + 4, and places it in the "Yes" column; presents the second card, 7 + 2, and places it in the "No" column; and repeats the process with several more positive and negative examples
- Asks the class to look at the examples under each column and determine how they are the same and different
- Introduces more flash card examples and nonexamples of the concept, and asks students to choose under which column to put them; continues until most students have learned the concept
- Asks students who have attained the concept to share their essential attributes for the concept *10* with the remainder of the class
- Asks the class to create their own examples and come up and place them in the proper columns

By seeing numbers that do and do not form the concept, learners gradually learn to group all like instances and arrive at the essential attributes that define the concept. Figure 8.8 (p. 270) shows the advance organizer in the form of an activity sheet that this teacher used to introduce the concept and provide the structure for the lesson.

Inquiry Learning

The higher-order goals of indirect instruction can also include inquiry learning. If the goal of your lesson is to promote inquiry, you will want your instruction to emphasize how things are organized, how they change, and how they interrelate, within which concept learning may be a part of the larger inquiry process. Here the emphasis is on *how we come to know something*, more than on *what we know* (Borich & Hao, 2007; Ong & Borich, 2006).

For example, the teacher conducting the "Math Facts That Equal 10" lesson may find that her lesson can be raised to a higher level by having students inquire into the use of a number line to show how addition, subtraction, and positive and negative numbers can

Figure 8.8 An Advance Organizer and Activity Sheet for the Concept Learning Lesson "Math Facts That Equal 10"

What numbers can come together to make the number 10?

	Yes	No
5 + 5	5 + 5	16 – 5
16 – 5		
11 – 1		
12 – 2		
6 + 6		
6 × 2		
10 × 1		
3 + 4 + 4		
3 + 3		
12 – 4		
9 + 1		
2 + (2 × 3)		
4 × 2		
15 – 1		
3 + 4		
16 – 10		

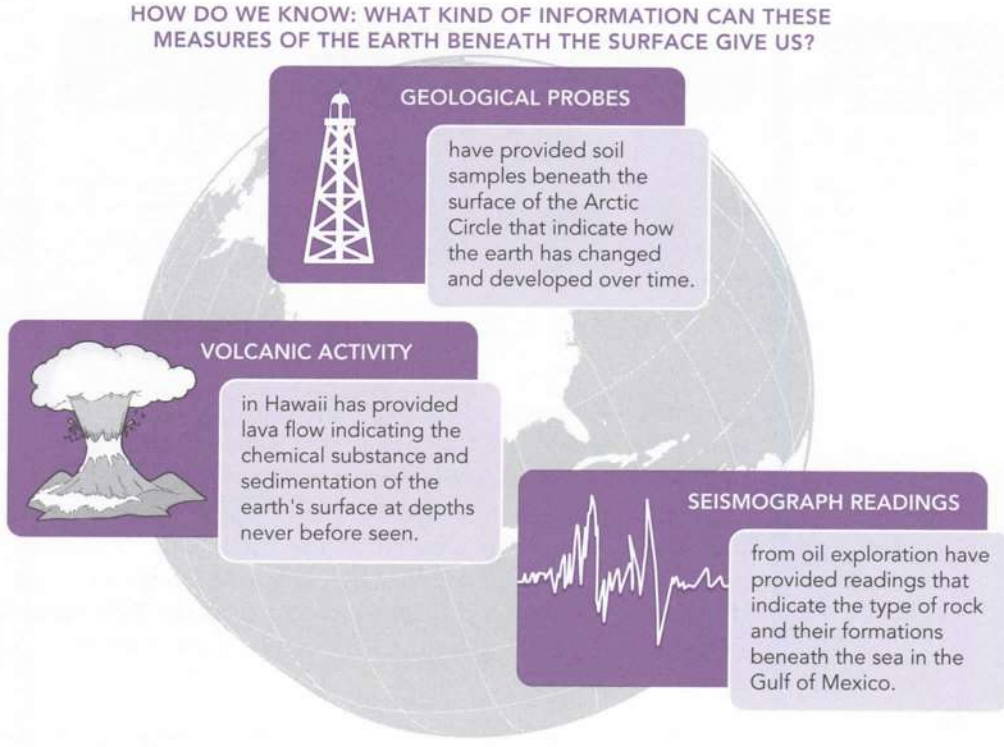
be used to represent the concept *10*. The result of this inquiry may be much less definite than the learning of a concept; in fact, the result is often more questions with which to continue the inquiry.

For example, in a physical science lesson on the internal structure of the earth, a teacher promoting facts, rules, and action sequences might give students the names and descriptions of the earth's layers—or *what we know*. But another teacher promoting inquiry might direct her students toward *how we know*—for example, How do we know what the internal structure of the earth is without ever having experienced it? The former lesson requires the acquisition of facts told by the teacher, but the latter requires exploration and discovery by the students themselves. In this lesson, the inquiry process might turn to indirect measures of the internal structure of the earth and what some of these measures might be. Students might inquire about the methods used to explore beneath the earth's surface, such as the transmission and reflection of the shockwaves created by earthquakes, seismograph readings from oil exploration, and geological probes driven deep under the earth's surface to see how it has changed over time.

Using examples of shockwaves from around the world, this teacher might ask several questions of her students to organize the inquiry process that do the following:

- Go beyond immediately available information. ("What do we know from looking at these shockwaves from a recent earthquake?")
- Interpret the consequences of information or ideas. ("What do the shockwaves from these two different earthquakes tell us about how deep the earth's crust is?")
- Make predictions as a way of making students use the information they have gained from their inquiry. ("Given the shockwaves from around the world you have seen, where do you predict the next earthquake will be?")

Figure 8.9 Advance Organizer for the Inquiry Lesson "Beneath the Earth's Surface"



Unlike concept learning, the inquiry approach leads to alternative paths and solutions in the process of exploring and discovering new information about a topic. Figure 8.9 shows the advance organizer that this teacher used to introduce the lesson "Beneath the Earth's Surface" with a framework or structure that organizes its content and promotes the goal of inquiry. Also see In Practice: Focus on Inquiry Learning on pages 273–274.

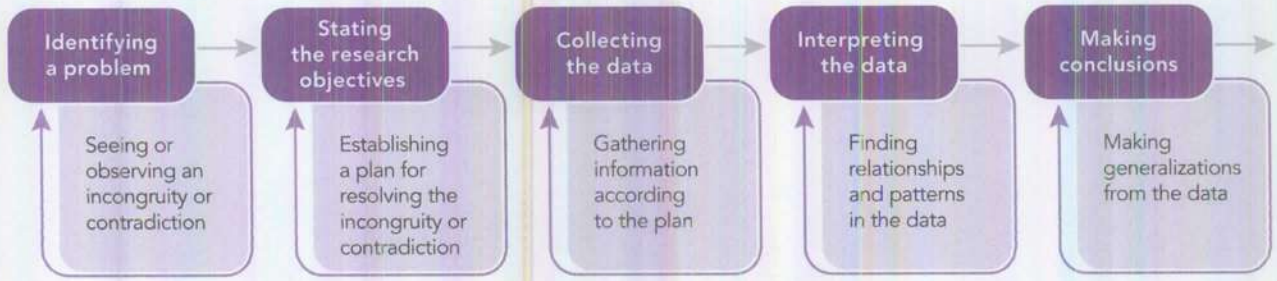
Problem-Centered Learning

Whereas the inquiry approach leads to alternative paths and solutions in exploring new information, a problem-centered approach to achieving higher-order outcomes identifies and provides for students in advance all the steps required to solve a particular problem. It is therefore less open ended than the inquiry approach, in which the steps to a task are explored and discovered through student inquiry.

For example, you might begin a general science lesson on "The Invisible Forces of Gravity" by demonstrating that liquid cannot be sucked through a straw from a tightly sealed bottle. The question Why does this happen? establishes the problem. You then might give your students a problem-solving sequence like the one shown in Figure 8.10 (p. 272) to guide their investigation of the problem. The chart, showing the sequence of events, becomes an advance organizer for the lesson that the class can follow. Each step provides an organizational branch for a particular part of the lesson.

Further content organization is provided by another advance organizer in Figure 8.11 (p. 272). Here the problem has been organized hierarchically to show the internal branching, or decisions, that must be followed to arrive at a conclusion. This form of content organizer can provide a particularly effective attention getter when students are

Figure 8.10 Sequential Advance Organizer for the Problem-Solving Lesson "The Invisible Forces of Gravity"

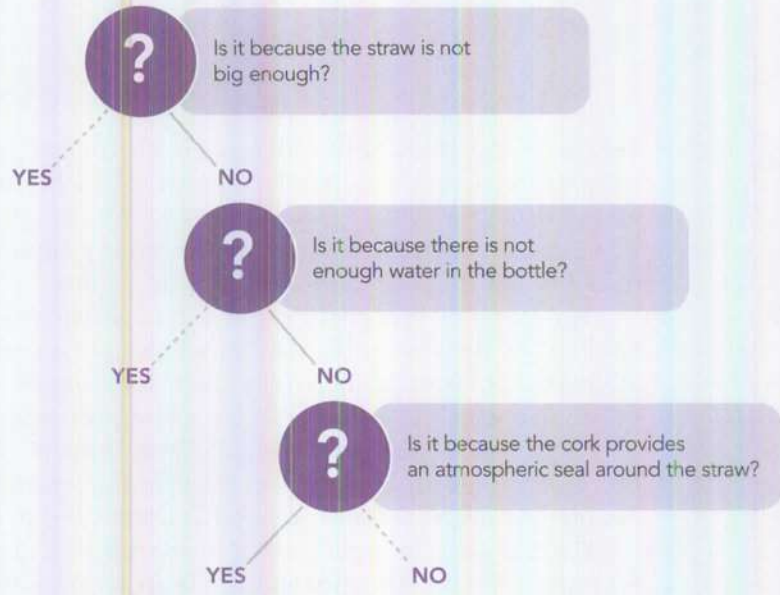


asked to contribute decision points to the organizer as the problem is being solved and to trace each decision point (indicated by a solid line) to answer the question, Why doesn't the liquid flow through the straw?

A problem-centered organization of a lesson or unit recognizes the need to develop problem-solving skills as well as the knowledge and skills to respond to previously unforeseen circumstances. Problem-centered learning has several distinct characteristics that guide lesson and unit development (Delisle, 1997; Ong & Borich, 2006; Teo, 2006; Wiske, 1997). When planning a problem-centered lesson or unit, remember to do these things:

- Clearly define the problem. Although the solution may not be in sight, the problem should be described in detail and placed within a meaningful context close to your learners' everyday experience.

Figure 8.11 Hierarchical Advance Organizer for the Problem-Solving Lesson "The Invisible Forces of Gravity"



IN PRACTICE

FOCUS ON INQUIRY LEARNING

In the process of inquiry, students identify problems, brainstorm solutions, formulate questions, investigate problems, analyze and interpret results, discuss, reflect, make conclusions, and present results (Bruner, 2004; Wiske, 1994). This cycle of inquiry serves as a general model for teachers planning inquiry activities that can guide students through the inquiry process. One version of the inquiry-learning cycle is the Ask, Investigate, Create, Discuss, and Reflect model illustrated in the accompanying figure. It is a five-step model for implementing an inquiry-based lesson or unit.

Five-Step Model for Inquiry-Based Learning

Step 1. Ask

To promote the desire to discover, the teacher begins by raising questions and inviting students to plan the inquiry procedures and presentation of findings. The teacher initiates the inquiry process by posing the lesson topic in the form of a question and then probing, prompting, and redirecting student responses to establish the inquiry climate. This is called the *teacher-initiated phase.*

When students are comfortable with the process, the teacher encourages them to raise a question of their own, to plan a procedure for answering the question, to determine how to carry out the procedure, and to decide how the results might be presented. This is called the *student-initiated phase.* This phase is a vehicle for building student-initiated questions and student-directed procedures that bring students to an independent level of inquiry. A question or a problem is the focus at this stage, which may be redefined later in the inquiry process.

Step 2. Investigate

After a student question is agreed on, the next step is to investigate it. At this stage of the inquiry, students are asked to recall prior knowledge or experiences related to the question and to brainstorm possible methods of investigating it by identifying resources and designing and carrying out a plan of action. Students also may redefine their question as new information unfolds. This information-gathering stage is a self-motivated process that is owned by the engaged students.

Step 3. Create

When the teacher and students have jointly determined that sufficient information has been gathered, students are asked to begin thinking critically about the relationship between the information (evidence) and their question—for example, how the information may or may not answer the question fully or completely. Here students synthesize the information they have uncovered to create new knowledge, which may be beyond their and possibly the teacher's prior experience. They start thinking critically about the appropriateness of their question or hypothesis, redefine their question and/or construct new ones, and decide whether to gather more data. Some interim product is expected at this stage, such as a chart synthesizing the information collected, an oral presentation that summarizes progress thus far, or a list of new or redefined questions.

Step 4. Discuss

At this stage, students discuss their findings, new ideas, and experiences with one another. Students share their experiences and investigations in their learning community, which can be a collaborative group or the entire class. When a small-group format is used, different groups may use the inquiry process to answer different questions that may have evolved from Steps 2 and 3. The task at this stage may include comparing notes, discussing conclusions, and sharing experiences across groups.

(continued)

Step 5. Reflect

After discussion, students critique and communicate their results to their learning community (group or class), during which they are expected to reflect on their newly acquired knowledge. Methods for presenting findings are selected in consultation with the teacher. These methods can include a traditional written or oral report or a more extensive multimedia presentation, production, or exhibit (Martinello & Cook, 2000). Students' tasks include reflecting on the appropriateness of their question, their methods of investigation, and the accuracy of their conclusions. These tasks encourage students, either in groups or as a class, to evaluate whether a satisfactory solution was found, whether a new question is warranted, and, if so, what the new question might be by taking inventory of what has been done and making new observations. If new questions emerge, the cycle of inquiry can start again with a new lesson.

- Make clear to your learners that they are to predict how to solve the problem. Predictions should be achievable within a realistic time frame and available resources and can be altered as new information is obtained.
- Indicate that learners will be expected to access, evaluate, and utilize data from a variety of sources. They will need to critically examine their sources and reject those that are less credible or are opinion rather than fact.
- Require that solutions fit the problem and be accompanied by clearly stated reasons as to their value or effectiveness (e.g., can be implemented more quickly, at less cost, or with superior results).

Concept learning, inquiry learning, and problem-centered learning—either singly or in combination—are useful tools for organizing your lessons for indirect instruction and providing advance organizers that communicate to your students the key steps, decisions, and relationships to be learned. These and other approaches, including project-based learning, will be discussed more in the chapters ahead.

CONCEPTUAL MOVEMENT: INDUCTION AND DEDUCTION

Our next teaching strategies for indirect instruction are induction and deduction.

Induction is a form of reasoning used to draw a conclusion or make a generalization from specific instances (Stadler, 2004; Tamir, 1995). It is a process in which students observe specific facts and then generalize them to other circumstances. Much of our everyday thinking proceeds in this manner, as illustrated by these examples:

1. We notice that rain-slick roads are causing accidents on the way to school, so we reduce our speed at all subsequent intersections.
2. We get an unsatisfactory grade on a chemistry exam, so we study 6 extra hours a week for the rest of the semester in all our subjects.
3. We see a close friend suffer from the effects of drug abuse, so we volunteer to disseminate information about substance abuse to all our acquaintances.
4. We have a math teacher who is cold and unfriendly, so we decide never to enroll in a math course again.

What these examples have in common is that they start with a specific observation of a limited set of data and end with a generalization to a much broader context. Between the beginning and end of each sequence is an interpretation of observed events and the projection of this interpretation to all similar circumstances.

Deduction is reasoning that proceeds from principles or generalizations to their application in specific instances. Deductive thinking includes testing generalizations to see if they hold in specific cases. Typically, a laboratory experiment in the sciences follows the deductive method. In these fields, the experimenter begins with a theory or hypothesis about what should happen and then tests it with an experiment to see if it can be confirmed, as was shown by the sequence of steps in Figure 8.10. If it is confirmed, the generalization with which the experiment began is accepted as true, at least under the conditions of the experiment.

The following steps are used in deductive thinking:

1. State a theory or generalization to be tested.
2. Form a hypothesis in the form of a prediction.
3. Observe or collect data to test the hypothesis.
4. Analyze and interpret the data to determine if the prediction is true.
5. Conclude whether the generalization held true in the specific context in which it was tested.

Deductive methods are familiar in everyday life. For example, let's change the four examples of inductive thinking listed previously to examples of deductive thinking. Here are the examples again—this time, illustrating deduction:

1. We believe rain-slick roads are the prime contributor to traffic accidents at intersections. We make observations one rainy morning on the way to school and find that indeed more accidents have occurred at intersections than usual. Our prediction that wet roads cause accidents at intersections is confirmed.
2. We believe that studying more will not substantially raise our grades. We study 6 extra hours for our math test and find that our grade has gone up. Our prediction that extra studying won't help our grades turns out to be wrong.
3. We believe that drug abuse can be detrimental to one's physical and emotional well-being. We observe and find physical and emotional effects of drug abuse in acquaintances who have admitted to using them. Our prediction that drug abuse and physical and emotional impairment are related has been confirmed.
4. We believe we will never like a math class because they are taught by cold and unfriendly teachers. We are required to take a math class and find we have just such a teacher. Our prediction that math classes are taught by cold and unfriendly teachers has been shown to be accurate—at least in this instance.

These examples of deduction have in common the fact that they begin with a general statement of belief—a theory and hypothesis—and end with some conclusion based on an observation that tested the truth of that theory or hypothesis. Of course, our observation only entailed one instance of that theory or hypothesis; we could be wrong in some other instances. (For example, you might have no problem liking math taught by another instructor or liking sports, despite the fact that you once had a cold and unfriendly gym teacher.) As you might expect, deductive logic has been most closely associated with the scientific method.

Applying Induction and Deduction

Both induction and deduction are important tools for concept learning, inquiry learning, and problem-centered learning. Let's see how they were accomplished in our classroom dialogue on economic systems.

Many forms of investigation and laboratory experiments follow the deductive method in which the student begins with a prediction about what should happen in a specific instance and then conducts an investigation to see if the prediction comes true.

Using deduction, the teacher built a definition of tangible goods and tested it with a specific example: "Is a house tangible?" Notice how the examples increased in abstraction to better define what could be considered *tangible* (e.g., stocks and bonds). Also the teacher provided both examples and nonexamples to fine-tune this concept by showing that tangible goods in a capitalist system could exist at different levels but that some things (e.g., friendships, vacations) could not qualify as tangible goods. Also notice that a brief venture into deduction ended the teacher's introduction to capitalism. By asking students to name three countries that fit the concept of *capitalism*, he made them find specific instances that fit the general concept. This teacher also skillfully used the inductive process, beginning with specific instances of tangible goods (e.g., owning land) and increasingly broadening these instances to form a generalization (i.e., tangible goods are those things that last for a reasonable length of time).

Note that although at the end of the first part of the lesson most students understood the concept of *capitalism* as an economic system that allows the ownership of tangible goods that last, it was a rather crude interpretation that would fail many subsequent tests. For example, citizens of most socialist and communist countries own tangible goods that last a reasonable period of time (e.g., a wristwatch, a car, a set of dinnerware). Recall that this crude version of the concept of *capitalism* emerged even after carefully planned examples and nonexamples were provided. This means the teacher's job was not over. Further conceptual movement had to be made to fine-tune this concept, producing more accurate discriminations to be applied to the concept of *capitalism*.

This occurred in subsequent portions of the lesson, in which the teacher moved students from an initial definition of capitalism as "making money," offered by Robert at the start of the lesson, to a definition that included the following elements:

1. Ownership of
2. Tangible goods that are
3. Durable and
4. Can be sold

The teaching of concepts with the indirect instructional model uses inductive and deductive thinking to develop initially crude and overly restrictive concepts into more

Table 8.2 Comparison of Steps in Inductive versus Deductive Teaching

Teaching Inductively	Teaching Deductively
1. The teacher presents specific data from which a generalization is to be drawn.	1. The teacher introduces the generalization to be learned.
2. Each student is allowed uninterrupted time to observe or study the data that illustrate the generalization.	2. The teacher reviews the task-relevant prior facts, rules, and action sequences needed to form the generalization.
3. Students are shown additional examples and then nonexamples supporting the generalization.	3. Students raise a question, pose an hypothesis, or make a prediction thought to be supported by the generalization.
4. Student attention is guided first to the critical (relevant) aspects of the data supporting the generalization and then to the noncritical (irrelevant) aspects.	4. Data, events, materials, and objects are gathered and observed to test the prediction.
5. A generalization is made that distinguishes the examples from the nonexamples.	5. The results of the test are analyzed and a conclusion is drawn as to whether the prediction is supported by the data, events, materials, or objects that were observed.
	6. The starting generalization is refined or revised in accordance with the observations.

expansive and accurate understandings. Table 8.2 illustrates the different steps involved in inductive versus deductive teaching.

USING EXAMPLES AND NONEXAMPLES

You may learn the rule "Stop at red lights" to perfection, but until you have seen examples of when to modify the rule (e.g., when an emergency vehicle with flashing lights is behind you), you do not have the complete *concept* of a *red light*, only the *rule*.

To learn concepts, learners need to go beyond the acquisition of facts, rules, and sequences to be able to distinguish examples from nonexamples (Mayer & Wittrock, 1996). Observing examples and nonexamples—for example, when studying 6 extra hours pays off and when it does not, when disseminating drug abuse literature is likely to help and when it is not, when a cold and unfriendly teacher is likely to adversely affect your performance in a subject and when it is not—allows you to grasp concepts.

Examples represent the concept being taught by including all of the attributes essential for recognizing that concept as a member of some larger class. **Nonexamples** fail to represent the concept being taught by purposely not including one or more of the attributes essential for recognizing it as a member of some larger class. The use of examples and nonexamples defines the essential and nonessential attributes of a concept needed to identify it and make accurate generalizations about it.

Recall from our classroom dialogue some of the distinctions between the private ownership of goods and services under socialism compared to capitalism. How could this teacher develop this concept? The teacher would have to make clear that private ownership of goods and services in the context of different economic systems is always a matter of degree. That is, the system determines not only what is owned by

the government but how much and therefore what is unavailable for private ownership. Accordingly, the teacher might elicit a set of interchanges to bring out these points.

Teacher: What types of things could a group of people—say, the size of a nation—agree on that would be absolutely essential for everyone's existence?
Ronnie: Food.
Teacher: Good. What else?
Vanessa: Clothes.
Teacher: Very good.
Carey: Cars.
Teacher: What do you think about cars?
Ricky: If they couldn't agree on the importance of cars for everyone, then they would have to agree on some form of public transportation, like buses and trains.
Teacher: Yes, they would, wouldn't they? The examples show that private ownership within different economic systems is a matter of degree that depends on (a) what everyone values equally and (b) what everyone needs for everyday existence.

The teacher began the discussion by having students think about things that "a group of people—say, the size of a nation—[could] agree on that would be absolutely essential for everyone's existence"—thereby encouraging students to broaden their earlier and perhaps more narrow concepts of *capitalism* and *socialism*. The question first generated some nonexamples (e.g., food and clothes) that could not discriminate private ownership among economic systems, since everyone in different economic systems could be expected to value them equally. Then Ricky suggested something that may be more valued by the majority in a capitalistic system (privately owned cars), whereas some other method of transportation might be more valued by the majority in a socialistic system (an efficient public transportation system).

The class is helped to make one of the more subtle distinctions between capitalism and socialism through the use of examples and nonexamples. Notice also how this teacher used examples and nonexamples to sharpen distinctions and deepen understanding in these ways:

1. Using examples that vary in ways that are important to the concept being defined (e.g., a house is tangible, stocks and bonds are abstract, but both are instances of the concept of tangible goods)
2. Including nonexamples of the concept that nonetheless represent important dimensions of the concept (e.g., a vacation can be bought but is not durable and therefore not an instance of the concept of tangible goods)
3. Explaining why nonexamples *are* nonexamples, even though they may share some of the same characteristics (e.g., food and clothes may be equally valued among economic systems, but cars versus a public transportation system could not discriminate private ownership among economic systems)

USING QUESTIONS

Guiding concept learning, inquiry learning, and problem-centered learning with questions is the fourth indirect instruction strategy. One difference you may have noticed between the direct and indirect instruction dialogues is the way the teacher asks questions. In the direct instruction dialogue, the questions were specific and to the point,

aimed at eliciting a single right answer. But in the indirect instruction dialogue, the questions steered students to seek and discover the answers with minimum assistance from the teacher. In direct instruction, answering questions is how students show what they know so you may provide clues, hints, and probes. In indirect instruction, your questions guide students into discovering new dimensions of a problem or ways of resolving a dilemma.

The indirect instruction dialogue included several questions that guided the inquiry process. The purposes of this teacher's questioning were to focus students' attention and to promote the widest possible discussion of the topic from the students' point of view. In this manner, the class begins with everyone being able to participate, regardless of his or her task-relevant prior knowledge. By accepting almost any answer at the beginning, this teacher used student responses to formulate subsequent questions and begin the inquiry process to shape more accurate responses.

The point of using questioning strategies in indirect instruction then is not to arrive at the correct answer in the quickest and most efficient manner. Rather the point is to begin an inquiry process that not only forms successively more correct answers but also forms those answers using a personal search-and-discovery process chosen by the learner and guided by the teacher. For example, the teacher followed up Robert's response that capitalism means "making money" with the question "What else?" and followed Robert's next response ("owning land") with a leading response ("Not only land but . . ."), encouraging Robert to broaden his answer.

By beginning with a broad question such as "What does the word *capitalism* mean to you?" this teacher could have been confronted just as easily with the task of narrowing, not broadening, Robert's first response. In the next interchange, this problem actually occurs, because Robert replies that capitalism means "owning anything." Now the job is to narrow or limit his response, which is accomplished by presenting the first essential attribute of the concept of *capitalism:* tangible goods.

You can see that a single guided question in the context of indirect instruction is seldom useful in itself. Questions must dovetail into other questions that continually refocus the response (e.g., broaden, then narrow, then broaden slightly again) to keep the search going. The process is much like focusing a camera, because rarely is the camera initially set at the right focus for the subject. Similarly, we could not expect Robert's first response to represent perfectly the concept of *capitalism.* Just as one begins focusing the camera in the appropriate direction, often passing the point at which the subject is in focus, so did the teacher's follow-up probe lead Robert to overshoot the mark and respond with too broad a response (e.g., "owning anything"). The teacher acknowledged the error and slightly narrowed Robert's response by noting, "The word *capital* means 'tangible goods or possessions.' "

In addition to the questions we saw earlier that can guide the inquiry process, there are others that can do the following:

- Present contradictions to be resolved—("Who owns the highways under capitalism?")
- Probe for deeper, more thorough responses—("So what would be a good definition of *tangible goods?*")
- Extend the discussion to new areas—("What things could a group of people—say, the size of a nation—agree are absolutely essential for everyone's existence?")
- Pass responsibility back to the class—("Good question. Who knows the answer to who pays for services provided under a socialist system?")

Questions like these guide the inquiry process to increasingly better responses. This process is one of the most useful for achieving higher-order outcomes, where the back-and-forth (first wider, then narrower) focusing of student responses often is required to attain the appropriate level of generalization. We will have more to say about questioning strategies in the next chapter.

Small-group discussions often require the teacher to become a moderator, visiting each group periodically to answer questions, review and summarize, redirect group work, provide new or more accurate information, and achieve consensus.

LEARNER EXPERIENCE AND USE OF STUDENT IDEAS

The Changing View

Until recently, the use of student ideas was considered the centerpiece of indirect instruction. Using student ideas meant incorporating student experiences, points of view, feelings, and problems into the lesson by making the student the primary point of reference. A completely student-oriented lesson might be initiated by asking students what problems they were having with the content; these problems then would become the focus of the lesson. This approach was intended to heighten student interest, organize content around student problems, tailor feedback to individual students, and encourage positive attitudes and feelings toward the subject.

Although this was a laudable instructional strategy, the goals of incorporating student ideas into the lesson in this format often became the end itself, rather than the means by which learning could be accomplished. Unfortunately, many forms of problem-centered learning, inquiry learning, and concept learning were thought to be synonymous with open, freewheeling discussions that began and ended with student-determined ideas and content.

Although heightening student interest, selecting content based on student problems, and increasing affect are important goals, they are best achieved in a carefully crafted teacher–student dialogue that promotes higher-order thinking. These goals can and should be achieved in the context of classroom dialogue that encourages students to make reference to, use examples from, and draw parallels to and associations with their own experiences to achieve specific instructional goals. Therefore, in the indirect instruction model, use of student ideas is the means of promoting inquiry, attaining essential concepts, and solving problems as a springboard to higher-order thinking.

Using Student Ideas Productively

So how can teachers productively use student ideas in the context of indirect instruction? In this context, you can use student ideas in the following ways:

- Encourage students to use examples and references from their own experience, from which they can construct their own meanings.

- Share mental strategies by which the students can learn more easily and efficiently by seeing and hearing how you think through a question or problem.
- Ask students to seek clarification of and to draw parallels to and make associations with things they already know.
- Encourage understanding and retention of ideas by relating them to students' own sphere of interests, concerns, and problems.

For examples of these uses, recall again the dialogue about economic systems. By asking students to name three countries other than their own that follow a capitalistic economic system, the teacher elicited examples and references from the learners' experience.

Perhaps more important than the questions themselves was the way in which the teacher incorporated students' responses into the lesson. By asking what the word *capitalism* "means to you," this teacher was asking students to express themselves by using parallels and associations they already understood—perhaps by having a job, recalling a conversation with their parents about occupations, or by remembering television images of life in another country. Parallels and associations such as these are likely to be vastly different among students. This is desirable, both for heightening student interest and involvement and for exposing students to a variety of responses, many of which may be appropriate instances of the concept to be learned.

A third way to incorporate student ideas into your lesson is to allow students to respond using their own interests, concerns, and problems. Student interests—and especially individual choices affecting future assignments—can be important motivators for ensuring active student involvement in subsequent assignments that may be lengthy and time consuming.

Video Window

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Indirect Instruction

In this video, you will see Sue teaching a lesson on graphing to her second-grade learners. As you watch Sue's classroom, notice how she incorporates one of the central principles of indirect instruction—the use of questions to guide the search-and-discovery process. Using jellybeans to create an authentic problem that requires her learners to count and organize data, she gets them to actively engage in doing math and graphing with a real-world problem. Notice how, in the spirit of indirect instruction, Sue lets her students discover knowledge and understanding, sometimes through their mistakes—not just by telling them what she wants them to learn. As you look into Sue's classroom, describe specific instances of how her questions aid her learners' search for and discovery of meaning in these ways:

- By resolving problems and contradictions
- By probing deeper for more thorough responses
- By extending the discussion to new areas
- By passing responsibility back to the learner

Go to the Video Examples section of Topic 9: "Group Interaction Models" in the MyEducationLab for your course and complete the activity "Indirect Instruction."

Finally, notice within the context of our dialogue that student ideas remained content centered. The instruction allowed students to participate in determining the form in which learning occurred but not the substance of what was learned. This substance will usually be determined by your curriculum guide and textbook. Our example dialogue therefore contrasts with what is called **student-centered learning**, which allows students to select both the form and the substance. This is sometimes associated with **unguided discovery learning**, wherein the goal is to maintain a high level of student interest. This is accomplished largely by selecting content based on student problems or interests and by providing individually tailored feedback.

Sometimes unguided discovery learning is promoted in the context of independently conducted experiments, projects, portfolios, research papers, and demonstrations, for which the topic and form of inquiry may be selected by the student. However, even when unguided discovery learning is desired, the content still must fit within the confines of the curriculum. Therefore, whether your approach is the guided (as in this example) or unguided use of student ideas (as in research assignments), some preorganization and planning always will be necessary before you solicit and use student ideas.

STUDENT SELF-EVALUATION

The sixth strategy for indirect instruction is to engage students in evaluating their own responses and thereby take responsibility for their own learning. Because there may be many correct answers when teaching with the indirect instruction model, it will be virtually impossible for you to judge them all. In direct instruction, nearly all instances of the learned facts, rules, or action sequences likely to be encountered can be learned during guided and independent practice. But because specifying all possible instances of a concept is neither possible nor efficient with indirect instruction, you must teach students to look critically at their own responses.

You can encourage self-evaluation by gradually giving control of the evaluation function to students and by letting them provide reasons for their answers so you and other students can suggest needed changes. Recall that early in the dialogue, the teacher let the students know that some of the responsibility for determining appropriate answers would fall on them. After writing a list on the board, the teacher said, "OK. Who would like to say which of these are *capital?*" The message is received when Ricky responds and Vanessa modifies Ricky's response:

Ricky: Car and clothes are the only two I see.
Vanessa: I'd add stocks and bonds. They say you own a piece of something, although maybe not the whole thing.

Even after Vanessa's effort to correct Ricky's response, the teacher still does not supply an answer. Instead, he keeps the evaluation of the previous responses going by responding with "Could you see or touch it?"

The goal here was to create a student dialogue focused on the appropriateness of the previous answers. The success of this self-evaluation strategy is most readily seen in the dialogue that occurs between the students and teacher. This strategy promotes a student-to-student-back-to-teacher interchange, as opposed to the more familiar teacher-to-student-back-to-teacher interchange. The teacher's role is to maintain the momentum by offering hints or focusing statements that students can use to evaluate their previous responses. Classes of students who have knowledge of the content can sustain three, four, or even five successive exchanges among themselves before some redirection becomes necessary and control returns to the teacher. This is the mark of an effective and engaging group discussion that promotes higher-order thinking.

In the process of these exchanges, students learn the reasons for their answers in slow, measured steps and often from other students. And by allowing partially correct answers to become the bases for more accurate ones, the teacher can model for the class how to turn incorrect and partially correct answers into better ones. Especially during problem-centered learning, inquiry learning, and concept learning, these layers of refinement, gradually built up by student interchange, help students evaluate and refine their own responses.

Use of Group Discussion

When student-to-student-to-teacher exchanges grow into protracted interactions among a large number of students, a **full-group discussion** has begun (Burbules & Bruce, 2001). In this type of discussion, you may intervene only occasionally to review and summarize main points, or you may schedule periodic time-outs to evaluate the group's progress and to redirect, if necessary.

Group discussions can be useful for encouraging critical thinking, for engaging learners in the learning process, and for promoting the cooperative reasoning that is necessary in a democratic society (Brookfield & Preskill, 2005; Dillon, 1995; Gall & Gall, 1990; Hale & City, 2006). Because group discussion helps students think critically—to examine alternatives, judge solutions, make predictions, and discover generalizations—it is yet another approach to teaching concepts, inquiry, and problem solving. It is our seventh and last indirect instruction strategy.

When your objective is to teach content that is well structured in the text or workbook, a presentation–recitation format may be more efficient and effective than a discussion. This might be the case with topics requiring little personal opinion and judgment, for which agreement may be so high as to preclude the controversy needed to promote alternative viewpoints and solutions.

But sometimes concept learning, inquiry learning, and problem-centered learning can take on a less formal structure. At these times, you may prefer a group discussion to a presentation–recitation format. Here the lack of consensus can make a discussion rewarding. Here are some examples of discussion-oriented questions within which concept learning, inquiry learning, and problem-centered learning can occur:

- In what ways do you believe the cities of tomorrow can accommodate our growing population?
- In time of crisis or war, how can the legislative branch of government be influenced by the executive branch?
- Do you think "Little Red Riding Hood" is fact or fiction? In what ways might it have been real in the mind of its author?
- Technology—such as computers, automobiles, and television—makes our lives more comfortable and pleasant, but it has also allowed us to become so-called couch potatoes. In what ways can technology be used to help us become more fit?
- We once thought antibiotics were the magic bullet that removed the threat of infectious diseases. Now we know that the use of antibiotics has helped create new dangerous and resistant strains of bacteria. What are some other scientific advancements that have solved one problem but created another?
- Cinderella was poor and unloved but had a fairy godmother to help her out. Wilbur from *Charlotte's Web* was the runt of a litter and saved from death first by Fern and then by Charlotte. But most of us who are poor, little, or unloved do not have such magical or determined protectors. What are some ways to overcome these problems

by yourself? Name people from stories, movies, or real life who tapped their own resources to make their dreams come true.

- With changes in technology and economics, many jobs have been eliminated. We no longer have elevator operators or gas station attendants, for instance. Even travel agents are in danger of losing their customers to the Internet. What are some other jobs that may fade away and some that may come into existence with new technological advancements?

Topics such as these, which are not formally structured by the text and for which a high degree of consensus does not yet exist, make good candidates for discussion sessions for solving problems, promoting inquiry, and learning essential concepts. During these discussions, you are the moderator and your **moderating tasks** are as follows:

1. Orienting the students to the objective of the discussion ("Today we will discuss when a nation should decide to go to war. Specifically, we will discuss the meaning of the concept of *aggression* as it has occurred in history. In the context of a war between nations, your job at the end of the discussion will be to arrive at a concept that could help a president decide if sufficient aggression has occurred to warrant going to war.")
2. Providing new or more accurate information where needed ("It is not correct to assume that World War II started with the bombing of Pearl Harbor. Many events occurred earlier on the European continent that some nations considered to be aggression.")
3. Reviewing, summarizing, or putting together opinions and facts into a meaningful relationship ("Jin, Laura, and William, you seem to be arguing that the forcible entry of one nation into the territory of another nation constitutes aggression, and the rest of the class seems to be saying that undermining the economy of another nation also can constitute aggression.")
4. Adjusting the flow of information and ideas to be most productive for the goals of the lesson ("Mark, you seem to have extended our concept of *aggression* to include criticizing the government of another nation through political means, such as media broadcasts, speeches at the United Nations, and so forth. But that fits better the idea of a cold war, and we are trying to study some of the instances of aggression that might have started World War II.")
5. Combining ideas and promoting compromise to arrive at an appropriate consensus ("We seem to have two concepts of *aggression*—one dealing with the forcible entry of one nation into the territory of another and another that has to do with undermining a nation's economy. Can we combine these two ideas by saying that anything that threatens either a nation's people or its prosperity or both can be considered aggression?")

The moderating functions just listed will help you guide and redirect a large-group discussion without overly restricting the flow of ideas. During a large-group discussion, you should frequently perform one or more of these moderating functions to keep the groups on task and moving toward a final oral report or other group product. The more familiar the topic and the greater the consensus, the more you can relinquish authority to the group.

Small-group discussions, involving four to six students per group, may also be used during indirect instruction (Cohen, 1994; Marriott & Kupperstein, 1997; Nash, 2008). When multiple topics must be discussed within the same lesson and time does not permit a full-class discussion of them in sequential order, try using three, four, or five small groups simultaneously. You have three tasks in forming and guiding the groups: (1) to

form groups whose members can work together, (2) to distribute students with diverse learning needs across groups, and (3) to move among the groups to periodically focus the discussion and resolve problems. Stopping the groups periodically, either to inform the entire class of important insights discovered by a group or to apply moderating functions, will help keep the groups close together and maintain your direction and authority (Cragan, Wright, & Kasch, 2008).

Another group format for indirect instruction is to have students work in pairs or teams. This can be an effective format when the discussion entails writing (e.g., a summary report), looking up information (in the text, encyclopedia, etc.), or preparing materials (chart, diagram, graph, etc.) (Gillies, 2007; Johnson & Johnson, 1999; Jolliffe, 2007; Slavin, 2001). In the **pair or team discussions** arrangement, your role as moderator increases in proportion to the number of pairs or teams, so only brief interchanges with each may be possible.

The pair or team approach works best when the task is highly structured, when some consensus about the topic already exists, and when the orienting instructions fully define each member's role (e.g., Student A searches for the information, Student B writes a summary description of what is found, and both students read the summary for final agreement). Pairs or teams frequently become highly task oriented, so pairing or teaming tends to be most productive when the discussion objectives go beyond just delivering an oral report and include presenting a product to the class.

Gunter, Estes, and Mintz (2006) describe a pair arrangement based on the work of Lyman (1981). **Think, pair, share** is a simple technique in which students learn from one another and get to try out their ideas in a nonthreatening context before presenting them to the class. The benefits for the teacher include increased time on task in the classroom and greater quality of students' contributions to class discussions.

There are four steps to think, pair, share, and a time limit on each step is signaled by the teacher:

1. *The teacher poses a question.* The process of think, pair, share begins when the teacher poses a thought-provoking question for the entire class. Questions with single right answers are avoided. Questions must pose problems or dilemmas that students will be willing and able to think about.
2. *The students think individually.* Responding to a signal from the teacher, students are given a limited amount of time to think of their own answers to the problematic question. The time should be decided by the teacher on the basis of knowledge of the students, the nature of the question, and the demands of the schedule.
3. *Each student discusses his or her answer with a fellow student.* The end of the "think" step signals to the students that it is time to begin working with another student to reach consensus on an answer to the question. Each student now has a chance to try out possibilities. Together each pair of students can reformulate a common answer based on their collective insights to possible solutions to the problem.
4. *Students share their answers with the whole class.* In this final step, individuals present solutions individually or cooperatively to the whole class. Where pairs of students have constructed displays of their answers, as in a chart or diagram, each member of the pair can take credit for his or her specific contribution.

The success and quality of the think, pair, share activity will depend on the quality of the question posed in Step 1. If the question promotes genuine thought for students, genuine discussion and sharing will emerge from the successive steps.

Here is a lesson plan for our indirect instruction dialogue, following the written format provided in Chapter 4.

Example Indirect Instruction Lesson Plan

Social Studies

Unit Title: Economic Systems

Lesson Title: Comparisons and Contrasts among Capitalist, Socialist, and Communist Economies

1 **Gaining attention.** Ask if anyone knows where the phrase "government of the people, by the people, for the people" comes from to establish the idea that the principles and rules by which a country is governed also influence its economic system.

2 **Informing the learner of the objective.** *This session:* To relate economic systems to the ownership of goods and services in different countries. *Next session:* To be able to distinguish economic systems from political systems and to show why some economic systems are changing.

3 **Stimulating recall of prerequisite learning.** Ask for a definition of *capitalism*, and then refine it with questioning and probing. Continue probing until students arrive at a definition of *capitalism* as "an economic system that allows the ownership of tangible goods that last for a reasonable period of time." Check understanding by asking for three countries (other than ours) that have capitalist economies.

4 **Presenting the stimulus material.**

A. Ask what the word *socialism* means. Refine the definition by questioning and probing until a definition is arrived at that defines *socialism* as "an economic system that allows the government to control and make available to everyone as many things as possible that (1) everyone values equally and that (2) are seen as essential for everyday existence." Have students compare capitalism and socialism by degree of ownership of public services and degree of taxes paid under each system.

B. Ask what the word *communism* means, and establish its relationship to the idea of *community.* Refine the definition, using the concept of degree of ownership by questioning and probing until the students arrive at still more examples of things owned and controlled by the government under communism.

5 **Eliciting the desired behavior.**

A. Use questions to encourage identification of the public services most commonly owned under socialism—for example, hospitals, trains, and communication systems. Some types of farms and industries will also be accepted when their relation to the public good is understood.

B. Use questions to encourage identification of the public services most commonly owned under communism—for example, food supply, housing, and industries. Emphasize those services and goods that are different from those identified under capitalism and socialism.
C. Use questions to identify the amounts and types of things owned by the government across the three systems—socialism, communism, and capitalism—to establish the concept that differences among the systems are a matter of degree of ownership and degree of taxation.

6 **Providing feedback.** Pose questions in a manner that encourages the student to evaluate his or her own response and the responses of other students. Probe until the student's responses approximate an acceptable answer. On the blackboard, list side by side those goods and services the students have identified as likely to be owned by the government in all three systems and those likely to be owned uniquely by any one or combination of systems. Distinguish between these goods and services and the personal items students may have mentioned, such as clothes or household goods, which cannot be used to distinguish economic systems.

7 **Assessing the behavior.** After students have written an essay describing the economic systems of three countries of their own choosing, each of which represents a different economic system, grade them on their comprehension of the concepts of (1) *degree of ownership* and (2) *degree of taxation,* as cited in the textbook.

COMPARISON OF DIRECT AND INDIRECT INSTRUCTION

The direct and indirect instruction models were presented in separate chapters because each includes distinctive teaching strategies. But neither model need be used to the exclusion of the other. Many times, the two models can be effectively interwoven in a single lesson, as when a small number of facts, rules, or action sequences must be acquired before introducing a concept to be learned or problem to be solved. As you have seen, the models have two different purposes:

- The *direct instruction model* is best suited to the teaching of facts, rules, and action sequences and comprises six teaching strategies: daily review and checking, presenting and structuring new content, guided student practice, feedback and correctives, independent practice, and weekly and monthly reviews.
- The *indirect instruction model* is best suited for concept learning, inquiry learning, and problem-centered learning, and comprises seven teaching strategies: advance organization of content, induction and deduction, use of examples and nonexamples, use of questions, use of student ideas, student self-evaluation, and group discussion.

Table 8.3 places the objectives of the direct and indirect models of instruction side by side for comparison and presents some teaching events that distinguish each model.

Under direct instruction, the objective is rapid attainment of facts, rules, and action sequences. Content is divided into small, easily learned steps through a presentation

Table 8.3 Some Examples of Events under the Direct and Indirect Models of Instruction

Direct Instruction	Indirect Instruction
Objective: To teach facts, rules, and action sequences	*Objective:* To teach concepts, patterns, and abstractions
The teacher begins the lesson with a review of the previous day's work.	The teacher begins the lesson with advance organizers that provide an overall picture and allow for concept expansion.
The teacher presents new content in small steps, also providing explanations and examples.	The teacher focuses student responses using induction and/or deduction to refine and focus generalizations.
The teacher provides an opportunity for guided practice on a small number of sample problems and then prompts and models when necessary to attain 60% to 80% accuracy.	The teacher presents examples and nonexamples of the generalization, identifying critical and noncritical attributes.
The teacher provides feedback and correctives according to whether the answer was correct, quick, and firm; correct but hesitant; incorrect due to carelessness; or incorrect due to lack of knowledge.	The teacher draws additional examples from students' own experiences, interests, and problems.
The teacher provides an opportunity for independent practice with seatwork and strives for automatic responses that are 95% correct or higher.	The teacher uses questions to guide discovery and articulation of the generalization.
The teacher provides weekly and monthly (cumulative) reviews and reteaches unlearned content.	The teacher involves students in evaluating their own responses.
	The teacher promotes and moderates discussion to firm up and extend generalizations when necessary.

format that involves brief explanations, examples, practice, and feedback. Both guided and independent practice help ensure that students are actively engaged in the learning process at a high rate of success. Weekly and monthly reviews reinforce learned content and indicate what may need to be retaught.

Under indirect instruction, the objective is to teach concepts, patterns, and abstractions with a problem-, inquiry-, or concept-centered lesson. Here the teacher prepares for teaching higher-order outcomes by providing an overall framework or content organization into which the day's lesson is placed, allowing for problem solutions, paths of inquiry, and concepts to be developed. Initially crude and inaccurate responses are gradually refined through induction and deduction, focusing on the generalization of what is learned to some larger context. To accomplish this, both examples and nonexamples—some drawn from student interests and experiences—are used to distinguish essential from nonessential attributes. Throughout the teacher uses questions to guide students to inquire about and discover concepts and problem solutions and to evaluate their own responses. When the content is relatively unstructured, discussion groups may replace a more teacher-controlled format, and the teacher becomes a moderator.

CULTURALLY RESPONSIVE INDIRECT INSTRUCTION

Culturally sensitive teachers consider students' cultures and language skills when planning learning objectives and activities (Delpit et al., 2003). They also realize that lesson objectives should include more than just delivering content knowledge. Diverse students are often motivated by objectives that include the opportunity for affective and personal development, as well (Burbules & Bruce, 2001; Burnette, 1999; Lustig & Koester, 2005). Effective teachers thus consider how to include students' backgrounds,

perspectives, and experiences in framing the knowledge to be gained or the activities to be accomplished.

A concept that can help foster the affective and personal nature of your classroom is **social framing**, which is the context in which a message, such as a lesson, is received and understood. Ogbu (1995a,b, 2008) defined a *social frame* as a taken-for-granted context that delimits the sources from which meaning can be derived. When a teacher announces at the start of class, "Today's lesson will expect you to know the events that led up to the Civil War," he or she has implicitly set how you are supposed to participate and respond—a social frame. A social frame can be created that can make a lesson more or less understandable to a cultural or ethnic group that may be accustomed to an alternate frame. For example, Michaels and Collins (1984) report an example of an Anglo teacher who framed a story with linear, topic-centered patterns (e.g., "Today I will read you a series of events that happened in the lives of three characters"), whereas her African American students framed the task according to topic-associating patterns (e.g., "She's going to tell us the kinds of things that can happen to people"). While one group looked primarily for a sequential list of events that unfolded from the beginning to the end of the story, the other group made notes about the events and the memories they evoked. Thus frames that are ambiguous or less appropriate for one group than another can alter how and what content is heard or seen.

Bowers and Flinders (1991) and Lustig and Koester (2009) make a case for understanding the context in which different cultures expect information to be transmitted that is particularly relevant during indirect instruction. They recommend that the teacher (1) present content from the frame most dominant in the classroom, (2) clarify the nature of the frame through which learners must see and interact with the content (e.g., as facts to be learned, skills to be performed, or concepts to think about), and/or (3) negotiate, when necessary, the frame with students at the start of the lesson. Walqui (2000) points out that using frames for which English-language learners could expect more interactive instructional approaches resulted in these students showing deeper language processing and conceptual learning. These frames also provided learners with a greater opportunity for affective and personal development.

Bowers and Flinders (1991) suggest three ways of establishing a frame at the start of a lesson that encourage students to respond in like manner: self-disclosure, humor, and dialogue. Mendler, Curwin, and Mendler (2007) suggest that each is an effective technique for adding an affective and personal dimension to your frame:

- *Self-disclosure* involves being open about your feelings and emotions that lead up to the lesson. ("I've been struggling to make this topic meaningful, and here's what I've come up with.") Doing so will encourage similar statements of self-disclosure from students, which can be used to frame the lesson.
- *Humor* at the start of a lesson establishes a flexible, spontaneous, expressive mood from which frames can become established. ("Here's a funny thing that happened to me that's connected to what we're going to study today.") Using humor will encourage students to share their own personal episodes, which can be used to provide a context for the lesson.
- *Dialogue* involves the back-and-forth discussion of lesson content and is characterized by random and simultaneous responding. Here every student can expect to be heard, and the teacher expresses lesson content idiosyncratically in the words of the learners. The teacher uses the responses of students to further structure and elaborate lesson content.

Each of these framing techniques is believed to enhance student engagement during indirect instruction. The techniques are effective with students across cultural and ethnic groups, some of whom may be less responsive to the traditional frames of prepackaged lesson plans and textbooks.

A FINAL WORD

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Go to Topics 9, 10, and 11: "Group Interaction Models," "Inductive Models," and "Inquiry Models" in the MyEducationLab for your course, where you can apply and practice your understanding of the core teaching skills identified in the chapter with Building Teaching Skills and Dispositions learning units.

This chapter and the preceding one presented a variety of teaching strategies. When used with the appropriate content and purpose, these strategies can significantly improve your teaching effectiveness. Although both the direct and indirect models of instruction are significant contributions to teaching and learning, neither should exclusively dominate your instructional style. It would be unfortunate if your teaching exemplified only the direct model or the indirect model, because the original purpose of introducing these models is to increase the variety of instructional strategies at your disposal.

These models and their strategies provide a variety of instructional tools that you can use in many combinations to match your particular objectives and students. Just as different entrees have prominent and equal places on a menu, so should the direct and indirect models have prominent and equal places in your classroom.

The underlying point of Chapters 7 and 8 is that you should alternately employ the direct and indirect models to create tantalizing combinations of educational flavors for your students. Your own objectives are the best guide to what combination from the menu you will serve on any given day. In the chapters ahead, we extend this basic menu to provide still greater variety in the teaching methods you will have at your command.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 8 content. After reading the case history, go to Chapter 8 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Mr. Peterson's eighth-grade social studies class consists of approximately 30 students and is culturally diverse. They are currently studying a unit on economic systems. They have already established the similarities and differences between the private and public sectors of the economy. Today Mr. Peterson wants students to consider a factor that influences all economies.

Mr. Peterson: Amy, how many blacksmiths do you know?
Amy: Well, none.
Josh: What about the horseshoers who work at the racetrack?
Amy: But they don't heat up the iron like the village smithy, do they?
Mr. Peterson: You're right, Amy. Most of them just fit ready-made shoes nowadays. [Mr. Peterson pauses as he looks dramatically at the wall calendar.] Well, before we know it, it will be summer break, and I'll be needing a summer job to keep me busy. What do you think I should try this summer, Roberto? Maybe I'll be a gas station attendant. I always did like cars.
Roberto: [A bewildered pause.] A gas station attendant? You mean those guys that used to wipe your windshield and ask if you wanted regular or premium? Hey, Mr. Peterson, they're not around anymore.
Mr. Peterson: All right. What about being an elevator operator?

▶

Rosalia: You mean like the ones in the old movies who asked, "What floor, please?" and then opened the door with a lever or something? [She smiles.] I think you're trying to have some fun with us, Mr. Peterson. Those jobs just don't exist anymore.

Mr. Peterson: Now, why do you think those jobs—the blacksmith, the gasoline attendant, and the elevator operator—have all but disappeared?

Parish: Well, we drive cars to work today. We don't ride horses except for fun.

Amber: You can just slide your credit card into the machine at the pump and get your own gas.

Rosalia: And all you have to do in an elevator is push a button for your floor—and the door opens automatically.

Mr. Peterson: So what's the common denominator? [A pause with no response.] What has made all these occupations obsolete? What do you think, Monique?

Monique: Changing times, I guess.

Mr. Peterson: But what has changed, Monique? Do you mean hairstyles or pop music or the latest shade of nail polish?

Monique: No. [She smiles as she looks down at her bright turquoise nails.] I guess I mean modern times—you know, machines and things.

Gilbert: They call it "high tech," Monique.

Mr. Peterson: Machines? High tech? Any other ideas?

Rosalia: Well, I don't know how high tech cars are. After all, Gilbert, they've been around for a century. Maybe just changing technology.

Mr. Peterson: A very good term, Rosalia. You used Monique's idea of "changing times" and Gilbert's of "high tech." Gilbert's was too narrow to include the blacksmith example, and I showed Monique that "changing times" included too much, everything from pop music to nail polish. So to summarize, we could say that . . .

Roberto: Changes in technology influence the job market by eliminating some jobs.

Mr. Peterson: I couldn't have said it better, Roberto. Now tomorrow, we'll consider the role of technology in creating new jobs.

SUMMING UP

The key terms and main points in this chapter include the following:

Comparing Direct and Indirect Instruction

1. Indirect instruction is an approach to teaching and learning in which concepts, patterns, and abstractions are taught in the context of strategies that emphasize concept learning, inquiry learning, and problem-centered learning.
2. In indirect instruction, the learner acquires information by transforming stimulus material into a response that requires him or her to rearrange and elaborate on the stimulus material.
3. *Generalization* is a process by which the learner responds in a similar manner to different stimuli, thereby increasing the range of instances to which particular facts, rules, and sequences apply.
4. *Discrimination* is a process by which the learner selectively restricts the acceptable range of instances by eliminating things that may look like the concept but differ from it on critical dimensions.
5. The processes of generalization and discrimination together help students classify different-appearing stimuli into the same categories on the basis of essential attributes. Essential attributes act as magnets, drawing together all instances of a concept

without the learner having to see or memorize all instances of it.

6. The following are instructional strategies of the indirect model:
   - Use of advance organizers
   - Conceptual movement—inductive and deductive
   - Use of examples and nonexamples
   - Use of questions
   - Use of student ideas
   - Student self-evaluation
   - Use of group discussion

Content Organization

7. An *advance organizer* gives learners a conceptual preview of what is to come and helps them store, label, and package the content for retention and later use.
8. Three approaches to organizing content and composing advance organizers are concept learning, inquiry learning, and problem-centered learning.

Conceptual Movement: Induction and Deduction

9. Induction starts with a specific observation of a limited set of data and ends with a generalization about a much broader context.
10. Deduction proceeds from principles or generalizations to their application in specific contexts.

Using Examples and Nonexamples

11. Providing examples and nonexamples helps define the essential and nonessential attributes needed for making accurate generalizations.
12. Examples and nonexamples can be used in the following ways:
    - Providing more than a single example
    - Using examples that vary in ways that are irrelevant to the concept being defined
    - Using nonexamples that also include relevant dimensions of the concept
    - Explaining why nonexamples have some of the same characteristics as examples

Using Questions

13. In indirect instruction, the role of questions is to guide students into discovering new dimensions of a problem or new ways of resolving a dilemma.
14. Some uses of questions during indirect instruction include the following:
    - Refocusing
    - Presenting contradictions to be resolved
    - Probing for deeper, more thorough responses
    - Extending the discussion to new areas
    - Passing responsibility to the class

Learner Experience and Use of Student Ideas

15. Student ideas can be used to heighten student interest, to organize subject content around student problems, to tailor feedback to fit individual students, and to encourage positive attitudes toward the subject. Because these goals should not become ends unto themselves, however, a plan and structure should be in place for using student ideas in the context of strategies to promote concept learning, inquiry learning, and problem-centered learning.
16. Student-centered learning, sometimes called *unguided discovery learning,* allows the student to select both the form and the substance of the learning experience. This is appropriate in the context of independently conducted experiments, research projects, science fair projects, and demonstrations. However, the preorganization of content is always necessary to ensure that the use of student ideas promotes the goals of the curriculum.

Student Self-Evaluation

17. Self-evaluation of student responses occurs during indirect instruction when students are given the opportunity to reason out their answers so you and other students can suggest needed changes. Students can most easily conduct self-evaluation in the context of student-to-student-to-teacher exchanges, wherein you encourage students to comment on and consider the accuracy of their own and each other's responses.

Use of Group Discussion

18. A group discussion involves student exchanges with successive interactions among a large number of students. During these exchanges, you may intervene only occasionally to review and summarize, or you may schedule periodic interaction to evaluate each group's progress and redirect the discussion when necessary.
19. The best topics for discussion include those that are not formally structured by texts and workbooks and for which a high degree of consensus does not yet exist among your students.
20. Your moderating functions during discussion include the following:
    - Orient students to the objective of the discussion.
    - Provide new or more accurate information when needed.
    - Review, summarize, and relate opinions and facts.
    - Redirect the flow of information and ideas back to the objective of the discussion.

- Combine ideas and promote compromise to reach a consensus.

A Final Word

21. Direct and indirect instruction are often used together, even within the same lesson. You should not adopt one model to the exclusion of the other. Each contains a set of strategies that can compose an efficient and effective method for the teaching of facts, rules, and sequences and to solve problems, inquire, and learn concepts.

KEY TERMS

Advance organizer, 258
Constructivism, 259
Deduction, 275
Discrimination, 263
Examples, 277
Full-group discussion, 283
Generalization, 263
Induction, 274
Integrated bodies of knowledge, 261
Moderating tasks, 284
Nonexamples, 277
Pair or team discussions, 285
Small-group discussions, 284
Social framing, 289
Student-centered learning, 282
Think, pair, share, 285
Unguided discovery learning, 282

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. What three ingredients are brought together in the indirect model of instruction? Provide a content example in which all three are present.
*2. What types of behavioral outcomes are the direct and indirect instructional models most effective in achieving?
*3. Explain use of the word *indirect* in the indirect instruction model. Provide an example to illustrate your point.
*4. Why shouldn't direct instruction be used all the time? Give an example in which it would clearly not be appropriate.
*5. Explain what is meant by the terms *generalization* and *discrimination*. Give an example of a single learning task that requires both these processes.
*6. Identify which of the following learning tasks require only facts, rules, or action sequences (Type 1) and which require the outcomes expected from concept learning, inquiry, or problem solving (Type 2):
   a. Naming the presidents
   b. Selecting the best speech
   c. Shifting the gearshift in a car
   d. Writing an essay
   e. Describing the main theme in George Orwell's *1984*
   f. Hitting a tennis ball
   g. Winning a tennis match
   h. Inventing a new soft drink
   i. Reciting the vowel sounds
   j. Becoming an effective teacher
*7. Describe two problems that would result if a concept had to be learned using only the cognitive processes by which facts, rules, and sequences are acquired.
8. For each of the following, provide specific examples to show how the concept might best be taught inductively or deductively. Pay particular attention to whether your instruction should begin or end with a generalization.
   - Democracy
   - Freedom
   - Education
   - Effective teaching
   - Parenting
*9. For the concept of *effective teaching,* identify five essential attributes and five nonessential attributes that together could provide a definition.

Using what you have written, write a paragraph explaining what the concept of *effective teaching*.

*10. Using what you have learned in this and the previous chapter, identify the different purposes for asking questions in the direct and indirect models of instruction.

*11. What type of learning might be represented by group discussions that begin and end with student-determined ideas and content? How is this different from the use of student ideas in the context of the indirect instruction model?

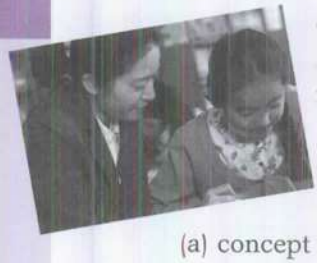
*12. For which of the following teaching objectives might you use the direct model of instruction, and for which might you use the indirect model?

a. Sing.
b. Use a microscope properly.
c. Appreciate Milton's *Paradise Lost*.
d. Become aware of the pollutants around us.
e. Solve an equation with two unknowns.
f. Read at grade level.
g. Type at the rate of 25 words per minute.
h. Write an original short story.
i. Create an award-winning science fair project.
j. Distinguish *war* from *aggression*.

Are there any for which you might use both models?

PROFESSIONAL PRACTICE

Field Experience and Practice Activities



Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B.

1. Prepare a 2-minute introduction to a lesson of your own choosing that provides students with an advance organizer.
2. Provide one example each of an advance organizer that reflects (a) concept learning, (b) inquiry learning, and (c) problem-centered learning in an area you will be teaching.

*3. In your own words, define *induction* and *deduction*. Give an example of each, using content from a subject you will be teaching.

*4. Think of a lesson that you have observed that promoted student ideas. What techniques did the teacher use to create this outcome? Which techniques would be most effect for the students and content you will be teaching?

5. Identify a group discussion topic in your teaching area for which moderating techniques would be needed. Describe when during the discussion each technique might be applied.
6. Provide an example of social framing using a topic you are likely to teach. Write a brief lesson introduction to indicate the words you might use to convey this frame to students at the beginning of class.

Digital Portfolio Activities

The following digital portfolio activities relate to INTASC principles 4 and 6.

1. In Field Experience and Practice Activity 2, you provided examples of advance organizers for lessons based on concept learning, inquiry learning, and problem-centered learning that you are likely to teach. Place these example organizers in a digital portfolio folder labeled "Advance Organizers" and add other advance organizers you observe or read about that could be used in the areas you will teach.

2. In Field Experience and Practice Activity 4, you were asked to identify techniques for promoting student ideas during indirect instruction that you have observed or will be teaching. Place these in a digital portfolio folder titled "Group Discussions" as examples of the techniques to apply when you are conducting a group discussion to promote student ideas.

Classroom Observation Activities

The following classroom observation activities relate to INTASC principles 4 and 6.

1. Seeing some of the many types of advance organizers and how they are delivered verbally and visually will be helpful to you in planning your own advance organizers. To record your Classroom Observation, go to Chapter 8 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 8.1. The Checklist for Observing Advance Organizers is divided into verbally delivered organizers and visual organizers (e.g., on board, transparency, or handout) and indicates whether each organizer is used at the beginning, middle, or end of the class or lesson. Observe in several of your college classes, if you cannot make a school visit, and record the uses of advance organizers that you see. Place the completed checklist in your "Advance Organizers" digital portfolio folder for use when you begin systematic classroom observation.
2. One aspect of a good group discussion is that the teacher is able to use student ideas to expand the discussion to related concepts and include other students. Several authors have described different ways of using student ideas:
   - *Acknowledging*—using the student's idea by repeating the logic of the idea expressed by the student
   - *Modifying*—using the student's idea by rephrasing it or conceptualizing it in the teacher's own words
   - *Applying*—using the student's idea to teach an inference or predict the next step in the logical analysis of the problem
   - *Comparing*—using the student's idea by drawing a relationship between it and ideas expressed earlier
   - *Summarizing*—using what was said by an individual student or a group of students as a summarization of concepts

   Go to Chapter 8 in the Book Specific Resources section in the MyEducationLab for your course. Go to the Classroom Observation section and select Observation Activity 8.2, titled Observing Use of Student Ideas. This form lists the five strategies for using student ideas and then provides space for checking the number of times the teacher uses each one. Look for the use of student ideas in a school or college classroom (maybe the one you are in) using the recording form provided. Place this form in your digital portfolio "Group Discussions" folder for use in future classroom observations.

9

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. What is an effective question?
2. What are some different types of questions?
3. What is a *question-asking sequence?*
4. How do I ask questions at different levels of cognitive complexity?
5. How do I ask questions that promote inquiry and problem solving?

INTASC

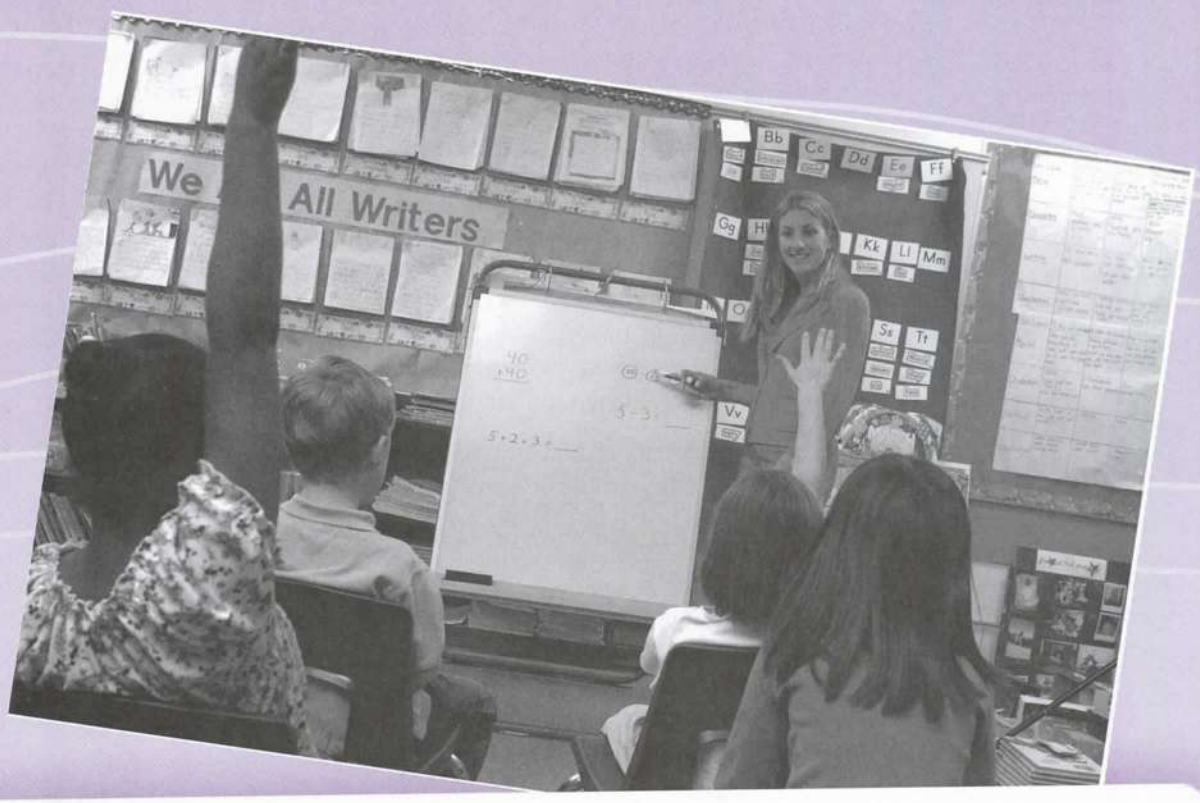
principle 1 The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students.

principle 3 The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.

principle 4 The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.

principle 6 The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

Questioning Strategies



In the classroom dialogues of previous chapters, you saw the important role of asking questions in the effective teacher's menu of instructional techniques. This is no coincidence, because most exchanges between teachers and students involve questions in some form. This chapter builds on earlier examples to define an effective question *and to discuss the varied ways questions can be asked and the types of questions you should ask more frequently than others.*

Also discussed is the closely related topic of probes. *Like questions, probes are effective catalysts for achieving the five key instructional goals of (1) lesson clarity, (2) instructional variety, (3) task orientation, (4) student engagement in the learning process, and (5) student success. Subsequent chapters will show you how to combine questioning techniques with other teaching strategies.*

WHAT IS A QUESTION?

In the context of a lively and fast-paced exchange in a classroom, questions are not always obvious. As observed by Dantonio and Beisenherz (2000) and Brown and Wragg (1993), students routinely report difficulty in identifying some types of questions during a classroom dialogue—and even whether a question has been asked. For example, imagine hearing these two questions:

Raise your hand if you know the answer.
Aren't you going to *answer the question*?

The first is expressed as a command (italics), yet it contains an implicit question. The second sounds like a question, yet it contains an implicit command. Will your students perceive both of these statements as questions? Will both evoke the same response?

Voice inflection is another source of confusion; it can indicate a question even when the syntax of the sentence does not. For example, imagine hearing the following two sentences spoken with the emphasis shown:

You *said* the president can have two terms in office?
The president can have *two* terms in office?

A certain voice inflection can turn almost any sentence into a question, whether you intend it or not. In addition, a real question can be perceived as a rhetorical question because of inflection and word choice:

We all have done our homework today, *haven't we?*

Whether this is intended as a question or not, all the students who failed to complete their homework will certainly assume the question to be rhetorical.

Effective questions are those for which students actively compose responses and thereby become engaged in the learning process (Borich, 2008a; Chuska, 2003; Walsh & Sattes, 2004). The previous examples show that effective questions depend on more than just words. Their effectiveness also depends on voice inflection, word emphasis, word choice, and the context in which they are asked. Questions can be asked in many ways, and each way can determine whether the question is perceived by your students, as well as how.

In this chapter, any oral statement or gesture intended to evoke a student response is considered a question. And if it evokes a response that actively engages a student in the learning process, it is an effective question. With this distinction in mind, let's explore the many ways of asking questions that actively engage students in the learning process.

What Consumes 80% of Class Time?

In almost any classroom at any time, you can observe a sequence of events in which the teacher structures the content to be discussed, solicits a student response, and then reacts to the response. These activities performed in sequence are the most common behaviors in any classroom. They represent the following chain of events:

1. The teacher provides structure, briefly formulating the topic or issue to be discussed.
2. The teacher solicits a response or asks a question of one or more students.
3. The student responds or answers the question.
4. The teacher reacts to the student's answer.

The teacher behaviors in this chain of events include the activities of **structuring, soliciting,** and **reacting.** At the heart of this chain is soliciting, or question-asking behav-

ior. Questions are the tool for bridging the gap between your presentation of content and the students' understanding of it. The purpose of questioning must not be lost among the many forms and varieties of questions presented in this chapter. Like all the ingredients of direct and indirect instruction, questions are tools to encourage students to think about and act on the material you have structured.

The centerpiece of this chain—soliciting or questioning—is so prevalent that as many as 100 questions per class hour may be asked in the typical elementary and secondary classroom. Sometimes as much as 80% of all school time can be devoted to questions and answers. This enormous concentration on a single strategy attests both to its convenience and its perceived effectiveness. But as noted, not all questions are effective questions. That is, not all questions actively engage students in the learning process.

Are We Asking the Right Questions?

Some research data indeed show that not all questions actively engage students in the learning process. Early studies estimated that 70% to 80% of all questions require the simple recall of facts; only 20% to 30% require the higher-level thought processes of clarifying, expanding, generalizing, and making inferences (Corey, 1940; Haynes, 1935). Evidently, little has changed since these early studies. More recent work in the United States and England indicates that of every five questions asked, about three require data recall, one is managerial, and only one requires higher-level thought processes (Atwood & Wilen, 1991; Brown, 2001; Brown & Wragg, 1993; Wragg, 2001).

This lopsided proportion of recall questions to thought questions is alarming. The behaviors most frequently required in adult life, at work, and in advanced training—those at the higher levels of cognitive complexity involving analysis, synthesis, and evaluation—seem to be the least practiced behaviors in the classroom (Chuska, 2003; Dantonio & Beisenherz, 2000; Power & Hubbard, 1999; Wiske, 1997).

WHAT ARE THE PURPOSES OF QUESTIONS?

It would be easy to classify all questions as either *lower order* (requiring the recall of information) or *higher order* (requiring clarification, expansion, generalization, and inference). But such a broad distinction would ignore the many specific purposes for which questions are used. Most reasons for asking questions can be classified into the following general categories:

1. *Getting interest and attention.* "If you could go to the moon, what would be the first thing you would notice?"
2. *Diagnosing and checking.* "What is the meaning of the Latin word *via?*"
3. *Recalling specific facts or information.* "What are the names of the main characters in *The Adventures of Huckleberry Finn?*"
4. *Managing.* "Did you ask my permission?"
5. *Encouraging higher-level thought processes.* "Putting together all that we have learned, what household products exhibit characteristics associated with the element sodium?"
6. *Structuring and redirecting learning.* "Now that we have covered the narrative form, let's talk about what expository writing is."
7. *Allowing expression of affect.* "What did you like about *Of Mice and Men?*"

Most of the questions in these categories have the purpose of shaping or setting up the learner's response. In this sense, a well-formulated question serves as an advance organizer, providing the framework for the response to follow.

WHAT ARE CONVERGENT AND DIVERGENT QUESTIONS?

Questions can be narrow or broad, encouraging either a specific, limited response or a general, expansive one. A question that limits an answer to a single or small number of responses is called a **convergent** (or *direct* or *closed*) **question.** For these questions, the learner has previously read or heard the answer and so has only to recall certain facts.

Convergent questions set up the learner to respond in a limited, restrictive manner: "What is the meaning of the Latin word *via?*" "What are the names of the main characters in *The Adventures of Huckleberry Finn?*" The answers to these questions are easily judged right or wrong. Many convergent, or closed, questions are used in direct instruction. As mentioned, up to 80% of all questions may be of this type.

Another type of question encourages a general or open response. This is the **divergent** (or *indirect* or *open*) **question.** It has no single best answer, but it can have wrong answers. This is perhaps the most misunderstood aspect of a divergent question. Not just any answer will be correct, even in the case of divergent questions raised for the purpose of allowing students to express their feelings. If Carlos is asked what he liked about *Of Mice and Men* and he says "Nothing" or "The happy ending," then either Carlos has not read the book or he needs help in better understanding the events that took place. A passive or accepting response on your part to answers like these is inappropriate, regardless of your intent to allow an open response.

You can expect far more diverse responses from divergent questions than from convergent questions, which may explain why only 20% of all questions are divergent. It is easier to determine the right or wrong answer to a convergent question than to sift through the range of acceptable responses to a divergent question. Even so, it is your responsibility to identify inappropriate responses, to follow up on them, and to bring them back into the acceptable range. Thus you often will need to follow up on divergent questions with more detail, new information, or encouragement. In this sense, divergent questions become a rich source of lively, spontaneous follow-up material that can make your teaching fresh and interesting.

Note that the same question can be convergent under one set of circumstances and divergent under another. Suppose you ask a student to decide or evaluate, according to a set of criteria, which household products exhibit characteristics of the element sodium. If the student only recalls products from a previously memorized list, the question is convergent. But if the student has never seen such a list and must analyze the physical properties of products for the first time, the question is divergent.

Convergent questions also can inadvertently turn into divergent questions. When the answer to a question thought to involve simple recall ("What is the meaning of the Latin word *via?*") has never been seen before and the student arrives at the right answer through generalization and inductive reasoning (e.g., by thinking about the meaning of the English word *viaduct* or the phrase *via route 35*), the question is divergent.

A convergent question in one context may be a divergent question in another and vice versa. The question, "What do you think of disarmament?" may require the use of evaluation skills by eighth-graders but only the recall of facts by twelfth-graders who have just finished memorizing the details of the Strategic Arms Limitation Treaty. Also both of the questions, "What do you think about disarmament?" and "What do you think about the Dallas Cowboys?" may require some analysis, synthesis, or decision making, but for most of your students, the disarmament question will require a higher level of thought than the Dallas Cowboys question.

As has been shown, effective questions depend on more than just words. They also depend on the context of the discussion in which the question is raised, voice inflection, word emphasis, and word choice.

What Does Research Say about Asking Convergent and Divergent Questions?

Classroom researchers have studied the effects on student achievement of asking convergent and divergent questions (Cecil, 1995; Dillon, 2004; Gall, 1984; Hubbard & Power, 2003). Remember that far more convergent questions are raised in classrooms than divergent questions; the ratio is about 4:1. The rationales for using higher-level, divergent-type questions include promotion of critical thinking, formation of concepts and abstractions, and encouragement of analysis–synthesis–evaluation (Audet & Jordan, 2005; Bransford, Brown, & Cocking, 2000; Chuska, 2003).

Interestingly, research has not clearly substantiated that the use of higher-level questions is related to gains in student achievement—at least not as measured by tests of standardized achievement. Although some of the above studies have reported modest improvements in achievement scores with the use of divergent questioning strategies, others have not. Some studies have even reported larger achievement gains with convergent questioning than with divergent questioning strategies. Although these studies found a large imbalance in favor of convergent questions, four important factors must be considered when looking at their results:

1. Tests of achievement—and particularly tests of standardized achievement—use multiple-choice items that generally test for behaviors at lower levels of cognitive complexity. Therefore the achievement measures in these studies may have been unable to detect increases in behaviors at the higher levels of cognitive complexity that might have resulted from the use of divergent questions.
2. The diversity of responses normally expected from divergent questions, as well as the added time needed to build on and follow up on responses, may prohibit large amounts of class time from being devoted to higher-order questioning. Because less instructional time is usually devoted to divergent questioning than to convergent questioning, some study results may simply reflect the imbalance in instructional time, not their relative effectiveness.
3. The content best suited for teaching complex behaviors may constitute only a small amount of the content in existing texts, workbooks, and curriculum guides. Although this situation is changing as a result of constructivist views on teaching and learning, much of the typical curricula in math, science, English, and even the social sciences emphasize facts and understandings at the knowledge and comprehension levels. Until more curricula are written to encourage or require higher-level thought processes, the time teachers actually devote to these behaviors may not increase.
4. The thinking and problem-solving behaviors most closely associated with divergent questions may take much longer to detect in learners than less complex behaviors. Less complex behaviors (e.g., learning to form possessives, memorizing Latin roots, knowing multiplication tables) are quickly elicited with convergent questioning strategies and are readily detected with fill-in, matching, or multiple-choice exams at the end of a lesson or unit. But more complex and authentic behaviors (e.g., being able to derive meaning from stories such as *Charlotte's Web*, learning to distinguish economic systems from political systems, learning to analyze household products for their capacity to pollute the air we breathe, recognizing forms of quadratic equations) may take a unit, a grading period, or longer to build to a measurable outcome. This time span is beyond that of most, if not all, of the studies that have compared the effects of convergent and divergent strategies on school achievement.

Thus the seeming imbalance in the use and effectiveness of divergent and convergent questioning strategies may have little to do with the effectiveness of the strategies themselves. Because factual recall always will be required for higher-order thought

processes, convergent questions always will be a necessary precondition for achieving higher-level behaviors (Bruning, Schraw, Norby, & Ronning, 2004; Mayer, 2002). Also, because more instructional time is required for higher-order questioning, consistent use of moderate amounts of divergent questioning may be more practical and effective than intense but brief episodes of divergent questioning. The most appropriate convergent/divergent question ratio may be about 70:30, when lesson content emphasizes lower levels of cognitive complexity, to about 60:40, when lesson content emphasizes higher levels.

Many of the same studies that fail to link higher-order questioning with increases in school achievement indicate that higher-order questioning tends to encourage students to use higher thought processes in composing question responses. Research (Dillon, 2004) suggests that teachers who ask questions requiring analysis, synthesis, and evaluation tend to elicit these cognitive processes from their students more frequently than teachers who use fewer higher-level questions. Therefore asking divergent questions seems desirable, regardless of whether their immediate effects show up on standardized achievement tests. Most researchers would agree that the effects of higher-level questioning on the cognitive processes of learning justify its use with most lessons (Eggen & Kauchak, 2006; Ormrod, 2007a).

WHO ARE THE TARGETS OF QUESTIONS?

Questions at various levels of cognitive complexity can be directed to individuals, to groups, or to the entire class. Occasionally posing questions over the heads of some learners and under the heads of others will keep all students alert and engaged in the learning process (Stipek, 2003). In homogeneously grouped classes, questions can be spread across individuals, groups, and the full class but differentiated to fit the cognitive complexity most appropriate for the learners being taught. For example, general questions can be composed requiring more or less cognitive complexity and prerequisite knowledge, as illustrated in the following examples:

Less Complex	More Complex
"Tell me, Lupe, if you sat down to breakfast, what things at the breakfast table would most likely contain the element of sodium?"	"Lupe, what are some forms of the element sodium in our universe?"
"After the death of Lenny in *Of Mice and Men,* what happens to the other main character?"	"What is an example of dramatic irony in *Of Mice and Men?*"
"After thinking about the words *photo* and *synthesis,* what do you think *photosynthesis* means?"	"How does photosynthesis support plant life?"
"Ted, if we have the equation $10 = 2/x$, do we find x by multiplying or dividing?"	"Ted, can you solve this problem for x? $10 = 2/x$."

Notice that these examples vary not only in the cognitive processes they require but also in how they are framed, or phrased. Advance organizers, hints, and clues will be more appropriate for some types of learners than for others (Ngeow, 1998).

One way of framing questions for heterogeneous classes—and therefore differentiating your instruction—is to design them so different responses at various levels of complexity are required. You can accept less complex responses as being just as correct as more complex answers, if they match the level of the question being asked. Although

Table 9.1 Characteristics of More and Less Complex Questions

More Complex Questions	Less Complex Questions
Require students to generalize the content to new problems	Require students to recall task-relevant prior knowledge
Stymie, mystify, and challenge in ways that do not have predetermined answers	Use specific and concrete examples, settings, and objects with which students are familiar
Are delivered in the context of an investigation or problem that is broader than the question itself	Use a step-by-step approach, in which each question is narrower than the preceding one
Ask students to go deeper, clarify, and provide additional justification or reasons for the answers they provide	Rephrase or reiterate the answers to previous questions
Use more abstract concepts by asking students to see how their answers may apply across various settings or objects	Suggest one or two probable answers that lead students in the right direction
Are part of a sequence of questions that build to higher and more complex concepts, patterns, and abstractions	Are placed in the context of a game (e.g., 20 questions) with points and rewards

the responses from some learners may not be complete, you can evaluate them in terms of the cognitive complexity required by the question and the students' ability to respond to it. Therefore the elaboration given and depth of understanding required may be less for one type of learner than for another. Table 9.1 suggests specific questioning strategies.

W

Questions also can vary according to the sequence in which they are used. Recall that the most basic **question sequence** involves structuring, soliciting, and reacting. However, many variations are possible.

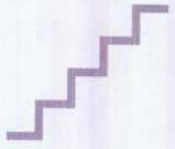
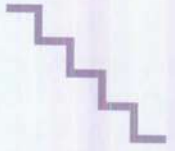
One of the most popular sequences employs divergent questions that lead to convergent questions. Many teachers begin the structuring–soliciting–reacting process by starting with an open question that leads to further structuring and then asking subsequent questions that involve recall or simple deduction. This general-to-specific approach can take several twists and turns. For example, in the following dialogue, the teacher begins by encouraging speculative responses and then narrows the focus by asking a question requiring simple deduction:

Teacher: What do astronauts wear on the moon?
Students: Spacesuits.
Teacher: So what element in our atmosphere must not be present on the moon?

The same approach is used when a teacher poses a problem, asks several simple recall questions, and then reformulates the question to narrow the problem still further:

Teacher: If the native Alaskans originally came from Siberia on the Asian continent, how do you suppose they got to Alaska?
Students: [No response.]
Teacher: We studied the Bering Strait, which separates North America from Asia. How wide is the water between these two continents at the closest point?

Table 9.2 Some Sequences of Questions

Type		Description
Extending		A string of questions of the same type and on the same topic
Extending and lifting		Initial questions request examples and instances of the same type, followed by a leap to a different type of question; a common sequence is likely to be recall, simple deduction and descriptions leading to reasons, hypothesis
Funneling		Begins with open questions and proceeds to narrow down to simple deductions and recall or to reasons and problem solving
Sowing and reaping		Problem posed, open questions asked, followed by more specific questions and restatement of initial problem
Step-by-step up		A sequence of questions moving systematically from recall to problem solving, evaluation or open ended
Step-by-step down		Begins with evaluation questions and moves systematically through problem solving toward direct recall
Nose-dive		Begins with evaluation and problem solving and then moves straight to simple recall

Source: From "Asking Questions" by G. Brown and R. Edmondson, in *Classroom Teaching Skills* (pp. 97–119), edited by E. Wragg. Copyright © 1984 by Nichols Publishing Company.

Student: About 60 miles. The Little and Big Diomede Islands are in between.
Teacher: If this expanse of water were completely frozen, which some scientists believe it was years ago, how might Asians have come to the North American continent?

Teachers frequently employ this type of *funneling:* adding conditions of increasing specificity to a question. However, no evidence indicates that one sequencing strategy is any more effective in promoting student achievement than any other. The specific sequence you choose should depend on your behavioral objectives, the instructional content being taught, and the ability level of your students.

Other types of questioning sequences that teachers can implement in a cycle of structuring, soliciting, and reacting, as suggested by Brown and Edmondson (1984), are illustrated in Table 9.2. These offer useful additions to your questioning strategies menu.

WHAT LEVELS OF QUESTIONS ARE USED?

As we have seen, as an effective teacher, you must be able to formulate divergent and convergent questions, to target questions to specific types of learners, and to arrange questions in meaningful sequences. You also must be able to formulate questions at different levels of cognitive complexity.

Table 9.3 Question Classification Scheme

Level of Behavioral Complexity	Expected Student Behavior	Instructional Processes	Key Words
Knowledge (remembering)	The student is able to remember or recall information and recognize facts, terminology, and rules.	Repetition, memorization	Define, describe, identify
Comprehension (understanding)	The student is able to change the form of a communication by translating and rephrasing what has been read or spoken.	Explanation, illustration	Summarize, paraphrase, rephrase
Application (transferring)	The student is able to apply the information learned to a context different from the one in which it was learned.	Practice, transfer	Apply, use, employ
Analysis (relating)	The student is able to break a problem down into its component parts and to draw relationships among the parts.	Induction, deduction	Relate, distinguish, differentiate
Synthesis (creating)	The student is able to combine parts to form a unique or novel solution to a problem.	Divergence, generalization	Formulate, compose, produce
Evaluation (judging)	The student is able to make decisions about the value or worth of methods, ideas, people, or products according to expressed criteria.	Discrimination, inference	Appraise, decide, justify

One of the best known systems for classifying questions according to cognitive complexity is the taxonomy of objectives in the cognitive domain that was presented in Chapter 3. This system has the advantage of going beyond the simple recall-versus-thought dichotomy frequently used in the research cited previously to provide learning outcomes at intermediate levels of cognitive complexity as well. Considering a continuum of question complexity, which fills the space between these ends of the scale, is useful in the art of asking questions.

Recall that the basic taxonomy of the cognitive domain contains six levels of cognitive complexity:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Table 9.3 identifies the types of student outcomes associated with each level. Look at each level to get a feel for the question-asking strategies that go along with it.

Knowledge

Recall from Chapter 3 that knowledge objectives require the student to recall, describe, define, or recognize facts that already have been committed to memory. Here are some action verbs you can use to formulate questions at the knowledge level:

define	identify	name
describe	list	recite

Sample questions include these:

- What is the definition of *capitalism*?
- How many digits are needed to make the number 12?

- Recite the first rule for forming a possessive.
- What is the definition of a *triangle*?

Notice that each of these questions can be answered correctly simply by recalling previously memorized facts. None requires understanding what was memorized or being able to use the learned facts in a problem-solving context. However, when facts are linked to other forms of knowledge, such as those in subsequent lessons and units, they become stepping stones for gradually increasing the complexity of teaching outcomes.

To avoid the overuse or disconnected use of questions at the knowledge level, ask yourself, Do the facts required by my questions represent task-relevant prior knowledge for subsequent learning? If your answer is no, you might consider assigning text, workbook, or supplemental materials that contain the facts, instead of incorporating them into your question-asking behavior. If your answer is yes, then determine in what ways learners will use the facts in subsequent lessons and raise questions that eventually will help form more complex behaviors.

Your students may not need to be able to recite the names of the presidents, the Declaration of Independence, or the elements in the periodic table, because these facts may not be task-relevant prior knowledge for more higher-order outcomes. However, your learners will likely need to recite the multiplication tables, the parts of speech, and the rules for adding, subtracting, multiplying, and dividing signed numbers, for these facts will be used countless times in completing exercises and solving problems at higher levels of cognitive complexity. Always take time to ask yourself, Are the facts I am about to teach relevant for attaining the desired outcomes of subsequent lessons? By doing so, you will avoid asking knowledge questions that may be trivial or irrelevant.

Comprehension

Comprehension questions require some level of understanding of facts the student has committed to memory. Responses to these questions should show that the learner can explain, summarize, or elaborate on the facts that have been learned. Here are some action verbs you can use in formulating questions at the comprehension level:

convert	extend	rephrase
explain	paraphrase	summarize

Here are some sample questions:

- In your own words, explain the concept of *capitalism.*
- How many units are there in the number 12?
- In converting a possessive back to the nonpossessive form, what must be rephrased so the first rule applies?
- What steps are required to draw a triangle?

In responding to each of these questions, the student acts on previously learned material by changing it from the form in which it was first learned. For example, the teacher does not ask students to define *capitalism;* rather the request is, "In your own words, explain the concept of *capitalism.*" This requires translation or conversion of the original definition (the teacher's) into another one (the student's).

There is an important step in moving from knowledge-level questions to comprehension-level questions. Knowledge-level questions require no cognitive processing at the time of the response, but comprehension-level questions do. In the former case, the learner actually may think about the material only once—at the time it was originally learned. In the latter case, the learner must actively think about the content twice—once when the facts are memorized and again when they must be composed into a response in a different form. Although fact questions must logically precede comprehension ques-

tions, comprehension questions are superior to knowledge questions in terms of encouraging longer-term retention, understanding, and eventual use of the learned material in more authentic contexts.

Application

Application questions extend facts and understanding to the next level of authenticity. They go beyond the memorization and translation of facts. Application questions require the student to apply the facts to a problem, context, or environment that is different from the one in which the information was learned. Thus the student can rely on neither the original context nor the original content to solve the problem.

Here are some action verbs you can use in formulating questions at the application level:

apply	employ	solve
demonstrate	operate	use

Here are some sample questions:

- What countries from among those listed have a capitalist economic system?
- Show me 12 pencils.
- Consider the first rule for forming possessives and apply it to the errors in the following newspaper article.
- Draw a triangle for me.

Your job in forming application questions is to present your learners with a context or problem different from that in which they learned the material. Application questions encourage the transfer of newly learned material to a new and different environment.

Answering application questions requires two related cognitive processes: (1) the simultaneous recall and consideration of all the individual units (facts) pertaining to the question and (2) the composing of units into a single harmonious sequence, so that the response becomes rapid and automatic. Application questions ask students to compose previously learned responses under conditions approximating real-world problems. You can see that action sequences require two precedents: (1) learned facts and understandings acquired from knowledge and comprehension questions and (2) the use of previously learned facts and rules in new contexts. The number and quality of your application questions will determine how rapid and automatic your learners' action sequences become.

As for other types of higher-order questions, the number of application questions you ask may be less important than your consistency in asking them. Many beginning teachers inappropriately believe that application questions should be reserved for the end of a unit or even the end of a grading period. But as you have seen, they are essential whenever a rapid, automatic response involving facts or rules is desired or when an action sequence is the lesson goal. Also remember that practice immediately following the presentation of content will better promote your learners' ability to reproduce that behavior at a later time.

The quality of your application questions will be determined largely by how much you change the problem, context, or environment in which the students learned the facts or rules. If the change is too small, transfer of learning to an expanded context will not occur, and your "parrots" will recite facts and rules from the earlier context. But if the change is too great, the new context may require a response beyond the grasp of most of your learners. The key to asking questions that require the transfer of learning to new problems or contexts is to be sure you have taught all the lower-order behaviors relevant for exhibiting the behavior in a new context. The easiest way to accomplish this is to change the context only a bit at first and then gradually shift to more unfamiliar contexts.

Analysis

Questions at the analysis level require the student to break a problem into its component parts and to draw relationships among the parts. Some purposes of questions at the analysis level are to identify logical errors; to differentiate among facts, opinions, and assumptions; to derive conclusions; and to make inferences or generalizations—in short, to discover the reasons behind the information given.

Here are some action verbs you can use in formulating questions at the analysis level:

break down	distinguish	relate
differentiate	point out	support

Here are some sample questions:

- What factors distinguish capitalism from socialism?
- Which of the boxes do not contain 12 things?
- Differentiate Rule 1 possessive errors from Rule 2 possessive errors in the following essay.
- In which of the following pictures do you see a triangle?

Analysis questions tend to promote behaviors in the form of concepts, patterns, and abstractions. They generally signal the start of the processes of concept learning, inquiry learning, and problem-centered learning and the beginning of the change from direct to indirect instructional strategies. However, the majority of analysis questions will lack a single best answer, which is common with the teaching of facts, rules, and action sequences. Consequently, you will have to evaluate a much broader range of responses at the analysis level. Even though you may not be able to anticipate all these responses, you can prepare yourself psychologically by shifting to a less regimented, more deliberate, and slower pace, thus giving yourself more time to evaluate students' answers and to compose thoughtful responses. And you should expect some responses for which a definitive response on your part may not be possible within the confines of your question-and-answer session.

Synthesis

Questions at the synthesis level ask the student to produce something unique or original—to design a solution, compose a response, or predict an outcome to a problem for which he or she has never before seen, read, or heard a response. This level often is associated with directed creativity (Anderson & Krathwohl, 2001; Marzano & Kendall, 2006), in which not all responses may be equally acceptable. The facts, rules, and action sequences, along with any analysis questions that have gone before, may define the limits and directions of the synthesis requested.

Here are some action verbs you can use in formulating questions at the synthesis level:

compare	formulate	create
predict	devise	produce

Here are some sample questions:

- What would an economic system be like that combines the main features of capitalism and socialism?
- What new numbers can you make by adding by 12s?
- Produce a paragraph showing possession without using the apostrophe *s*.
- What are some of the ways you could make a triangle without using a ruler?

Even more diversity in answers can be expected with synthesis questions than with analysis questions. Therefore, your preparation for diversity is critical to how your students receive your synthesis questions. For example, a question asking for ways to identify undiscovered elements other than by using the periodic table of chemistry opens up many possible responses. Some may not be acceptable ("Consult an astrologer"), but others may be ("Analyze minerals from the moon and other planets"). You will want to accept all reasonable answers, even though your own solutions may be limited to only a few, and keep in mind that some initially less acceptable responses can be built into more accurate, plausible, or efficient responses with additional questioning.

Recall that Table 9.2 showed different types of questioning sequences. These types of sequences can be used to expand on or restrict the initial question to better focus a student response and improve its accuracy, plausibility, or efficiency, as this dialogue illustrates:

Teacher: In what ways other than using the periodic table might we predict the undiscovered elements?

Carlos: We could go to the moon and see if there are some elements there we don't have.

Jessica: We could dig down to the center of the earth and see if we find any of the missing elements.

Daniel: We could study debris from meteorites—if we can find any.

Teacher: Those are all good answers. But what if those excursions to the moon, to the center of the earth, and to find meteorites are all too costly and time consuming? How might we use the elements we already have here on Earth to find some new ones?

Jessica: Oh! Maybe we could try experimenting with combinations of the elements we do have to see if we can make new ones out of them.

This simple exchange illustrates a funneling strategy: Broad, expansive answers are accepted and then followed up with narrower questions on the next round. In this manner, multiple responses that typically result from synthesis questions can be used to gradually structure and deepen an avenue of inquiry, thereby contributing to still higher-order outcomes.

Evaluation

Questions at this highest level of cognitive complexity require the student to form judgments and make decisions using stated criteria. These criteria may be subjective (when a personal set of values is used in making a decision) or objective (when scientific evidence or procedures are used in evaluating something). In both cases, however, it is important that the criteria to be expressed is clearly understood, although not necessarily valued, by others.

Here are some action verbs you can use in formulating questions at the evaluation level:

appraise	decide	justify
assess	defend	judge

Here are some sample questions:

- Citing evidence of your own choosing, argue whether capitalist or socialist countries have a higher standard of living.
- Which of the following numbers contain multiples of 12?
- Using Rules 1 and 2 for forming possessives and assigning 1 point for each correct usage, what grade would you give the following student essay?
- Given the following fragments of geometric shapes, decide which can be used to construct a triangle.

Evaluation questions have the distinct quality of confronting the learner with authentic problems much as they appear in the real world, as indicated by the list of higher-order thinking and problem-solving behaviors in Appendix C. Because making decisions and judgments is a primary task in adult life, it is essential that classroom experiences link learners to the world in which they will live, regardless of their age or maturity.

Unfortunately, evaluation questions often are reserved for the end of a unit. Moreover, evaluation questions are sometimes considered more suitable for the middle and high school levels than the elementary grades. Both misconceptions have reduced the impact of evaluation questions on learners. If learners are to cope with real-world problems, they must learn to do so starting at the earliest grades and then throughout their schooling. Therefore your ability to ask evaluation questions that can bring the world to your learners at their own level of knowledge and experience is one of the most valued abilities that you, an effective teacher, can have.

This ability, however, does not come easily. To be sure, many of the characteristics of the previously addressed higher-order questions—application, analysis, and synthesis—are present in evaluation questions. But with an evaluation question, criteria must be applied in deciding the appropriateness of a solution. Notice in the preceding examples that the criteria (or their source) are identified: "Citing evidence of your own choosing," "Which of the following," "Using Rules 1 and 2," "Given the following fragments." The more specific your criteria and the better your learners know them, the more actively engaged they will become in answering the question by using specified criteria from which to make a judgment.

Summary of Question Types

You now know the levels of questions that can be asked of learners and some factors to consider in selecting the appropriate type of question. To summarize:

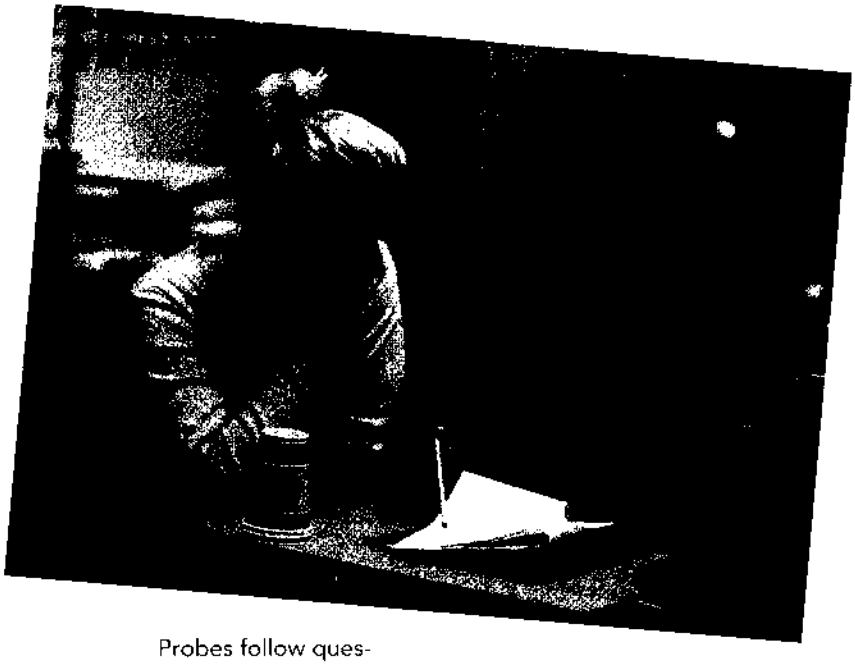
- *Type 1 behaviors* (those calling for the acquisition of facts, rules, and action sequences) generally are most efficiently taught with convergent questions, which have a single best answer (or a small number of easily definable answers). Type 1 behaviors are most effectively learned with a direct instruction model that focuses convergent questions at the knowledge, comprehension, and application levels of cognitive complexity.
- *Type 2 behaviors* (those calling for the acquisition of concepts, patterns, and abstractions) generally are most efficiently taught with divergent questions, for which many different answers may be appropriate. These behaviors are most effectively learned with an indirect instruction model that poses divergent questions at the analysis, synthesis, and evaluation levels of cognitive complexity.

Now that you are acquainted with these broad distinctions among types of questions, we turn to several specific techniques that can help you deliver these questions to your students with ease and perfection.

WHAT IS A PROBE?

A **probe** is a question that immediately follows a student's response to a question for one of these purposes:

- To elicit clarification of the student's response
- To solicit new information to extend or build on the student's response
- To redirect or restructure the student's response in a more productive direction



Probes follow questions and are used to clarify a student's response, solicit new information, or redirect a response in a more productive direction.

Use probes that elicit clarification to have students rephrase or reword a response so you can determine its appropriateness or correctness. **Eliciting probes**—such as "Can you say that in another way?" and "How does that answer apply in the case of _____?"—encourage learners to show more of what they know, thereby exposing exactly what they understand (Dann, 1995). The brief and vague responses often given in the context of a fast-paced and lively classroom discussion can mask partially correct answers or answers that are correct but were arrived at with flawed reasoning. When you are unsure how much understanding underlies a correct response, slow the pace by probing for clarification.

Use **soliciting probes**, which ask for new information, following a response that is at least partially correct or indicates an acceptable level of understanding. This time, you are using the probe to push the learner's response to a more complex level (e.g., "Now that you have decided the laboratory is the best environment for discovering new elements, what kind of experiments would you conduct there?" or "Now that you have taken the square root of that number, how can you extend the same idea to find its cube root?").

A soliciting probe builds higher and higher plateaus of understanding by using the previous response as a stepping stone to greater expectations and more complete responses. This involves treating an incomplete response as part of the next higher-level response—not as a wrong answer. The key to probing for new information is to make your follow-up question only a small extension of your previous question; otherwise the leap will be too great and the learner will be stymied by what appears to be an entirely new question. Using this type of probe, therefore, requires much the same process for finding the right answer as does the previously correct question, only this time applied to a different and slightly more complex problem.

Use **redirecting probes** to channel the flow of ideas instead of using awkward and often punishing responses, such as "You are on the wrong track," "That's not relevant," and "You are not getting the idea." Probes for redirecting responses into more productive areas can accomplish the needed shift less abruptly and more positively, without discouraging students from offering other responses. A probe that accomplishes this purpose moves the discussion sideways, setting a new condition for a subsequent response without negating a previous response.

Probing to redirect or restructure a discussion can be a smooth and effortless way of getting learners back on track. Notice in the following example how the teacher blends the use of all three types of probes in the context of a single discussion, as indicated by the use of bold italic type:

Teacher: What do we call the grid system by which we can identify the location of any place on the globe? [To begin the questioning.]

Jason: Latitude and longitude.

Teacher: Good. What does *longitude* mean? [***To solicit*** new information.]

Jason: It's the grid lines on the globe that . . . go up and down.

Teacher: What do you mean by *up and down*? [***To elicit*** clarification.]

Jason: They extend north and south at equal intervals.

Teacher: OK. Now tell me, where do they begin? [***To solicit*** new information.]

Jason: Well, I think they begin wherever it's midnight and end where it's almost midnight again.

Video Window

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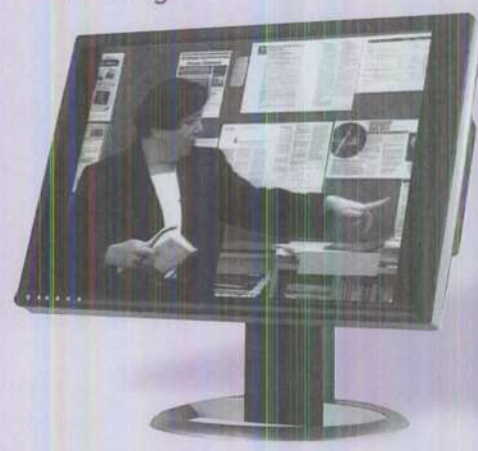
Higher-Order Questioning

In this video, you will see a high school literature class in which *The Scarlet Letter* is being taught. Instead of just telling learners about the story, this teacher draws from her students the significance of its characters with an in-class activity that asks them to feel and think like the main characters in the story. The dialogue of the classroom is lifted to a higher level than simply telling or discussing, setting the stage for students to acquire the higher-order outcomes of application, analysis, synthesis, and evaluation. Find specific instances in which this teacher asks questions at these higher levels. From viewing the reaction of the students, do you think they enjoyed this activity more than listening to a lecture on *The Scarlet Letter?* Why or why not?

Go to the Video Example section of Topic 7: "Strategies for Teaching" in the MyEducationLab for your course to view the video "Higher-Order Questioning."



Teacher: Let's think about that for a minute. Wouldn't that mean the point of origin would always be changing according to where it happened to be midnight? [***To redirect.***]

Jason: I see, so the grids must start at some fixed point.

Teacher: Anybody know where they begin? [***To solicit*** new information.]

La Jonne: Our book says the first one marked *0* starts at a place called *Greenwich, England.*

Teacher: How can a grid that runs continuously north and south around the globe *start* anyplace, La Jonne? [***To elicit*** clarification.]

La Jonne: I meant to say that it *runs through* Greenwich, England.

Teacher: Good. Now let's return to Jason's point about time. If we have a fixed line of longitude, marked *0,* how might we use it to establish time? [***To solicit*** new information.]

Jason: Now I remember. Midnight at the *0* longitude—or in Greenwich, England—is called *0 hours.* Starting from there, there are timelines drawn around the world, so that when it's midnight at the first timeline, it will be 1 o'clock back at Greenwich, England, and when it's midnight at the next timeline, it will be 2 o'clock back at Greenwich, England, and so on.

Teacher: What does that mean? [***To elicit*** clarification.]

Jason: Each line equals 1 hour—so . . . so there must be 24 of them!

Teacher: It should be no surprise to learn that time determined in reference to the 0 grid of longitude is called *Greenwich Mean Time* or *Coordinated Universal Time.*

How Should Wait Time Be Used?

An important consideration during questioning and probing is how long to wait before initiating another question. Sometimes your wait time can be as effective in contributing to the desired response as the question or probe itself, especially when you give students

Wait-time 1 refers to the amount of time a teacher gives a learner to respond to a question. Classrooms with short wait-time 1s do not give learners sufficient time to think before answering the question.

time to thoughtfully compose their answers. A wait time that is either too short or too long can be detrimental, and one that is too long also wastes valuable instructional time. Obviously, the wait time will be longer when students are weighing alternative responses (which often occurs during indirect instruction) than when their responses must be correct, quick, and firm (which often occurs during direct instruction).

Rowe (1986, 1987) and Tobin (1987) distinguish two different wait times. **Wait-time 1** refers to the amount of time a teacher gives a learner to respond when first asked a question. In a classroom with a short wait-time 1, learners do not have much time to think before answering the question. In such a classroom, the teacher is repeating the question or calling on another learner to answer the same question after only a 2- or 3-second period of silence.

Wait-time 2 refers to the interval of time after a learner's first response until the teacher or other students affirm or negate the answer and the teacher then moves on. In a classroom with a long wait-time 2, the teacher waits several seconds before asking a follow-up question, correcting the answer, or otherwise commenting on what the learner said, giving that learner and others time to rethink, extend, or modify a response. A classroom with a short wait-time 2 is characterized by frequent interruptions of learners before they finish answering.

The following dialogue illustrates wait-time 1 and wait-time 2:

Teacher: From our discussion yesterday about volcanoes, what is a *caldera?*

[Wait-time 1: The teacher gives students time to think about the question and read nonverbal cues indicating the possible need for a probe, which is especially important for divergent and higher-order questions.]

Nelda: I remember. It's the crater formed by the collapse of the central part of the volcano. I'm not sure, but I think it's used to vent all the steam and gases that spew out. . . .

[Wait-time 2: The teacher waits for Nelda or another student to think about and affirm or negate what was said, which is especially important for responses that are hesitant or only partially correct.]

Yes, that's it. Now I remember the picture in the text with all the smoke coming out of it.

Martin: She's right. That's how we drew it on the board. Everyone remember?

Teacher: And what else did the picture on the board show?

IN PRACTICE

FOCUS ON EFFECTIVE CLASSROOM QUESTIONING

In 2001, the Northwest Regional Educational Laboratory conducted an extensive study of the research on teacher questioning in the classroom. This study included research that had been conducted across the K–12 grades, the majority of which was concerned with the effects on student learning produced by questions at higher and lower cognitive levels. Here are some of the major findings from a report by Kathleen Cotton, drawn from 37 research documents and reported in *School Improvement Research Series: Research You Can Use, Close-Up #5* (available at www.nwrel.org/index.html).

The Research on Classroom Questioning Findings

Researchers who have conducted general investigations of the role of classroom questioning have drawn the following conclusions:

General Findings

- Instruction that includes posing questions during lessons is more effective in producing achievement gains than instruction carried out without questioning.
- Students perform better on test items previously asked as recitation questions than on items they have not been exposed to before.
- Oral questions posed during classroom recitations are more effective in fostering learning than written questions.
- Questions that focus student attention on primary elements in the lesson result in better comprehension than questions that do not.

Placement and Timing of Questions

- Asking questions frequently during class discussions is positively related to learning facts.
- Posing questions before reading and studying material is effective for students who are older, have higher ability, and/or are known to be interested in the subject matter.
- Very young children and poor readers tend to focus on content better if questions are posed about the content before the lesson is presented.

Cognitive Level of Questions

Should we ask questions that require the literal recall of content and only very basic reasoning? Or should we ask questions that call for speculative, inferential, and evaluative thinking? When researchers looked at the cognitive level of teachers' questions in relation to the subject matter, the students, and the teachers' intent, their conclusions indicated the following:

- On average during a classroom recitation, approximately 60% of the questions asked are lower-level cognitive questions, 20% are higher-level cognitive questions, and 20% are procedural questions.
- Lower-level cognitive questions are more effective than higher-level questions with young (primary-level) children, particularly those who are disadvantaged.
- Lower-level cognitive questions are more effective when the teacher's purpose is to impart factual knowledge and assist students in committing this knowledge to memory.
- In settings where a high incidence of lower-level questions is appropriate, a greater frequency of questions is positively related to student achievement.
- When predominantly lower-level questions are used, their level of difficulty should be such that most will elicit correct responses.
- In most classes above the primary grades, a combination of higher- and lower-level cognitive questions is superior to the exclusive use of one or the other.
- Students whom teachers perceive as slow or poor learners are asked fewer higher-level cognitive questions than students perceived as more capable learners.
- Increasing the use of higher-level cognitive questions (to more than 20%) produces superior learning gains for students above the primary grades and particularly for secondary students.

- Teaching students to draw inferences and giving them practice in doing so results in higher-level cognitive responses and greater learning gains.
- For older students, increases in the use of higher-level cognitive questions (to 50% or more) are positively related to increases in class participation, on-task behavior, and length of student responses.

Researchers conclude their report by stating that providing better preservice training in using wait time and asking higher-order questions both have the potential for increasing students' classroom participation and achievement.

Increasing either type of wait time has the following effects on learner responses:

- Learners give longer answers to questions.
- Learners volunteer more responses.
- There are fewer unanswered questions.
- Learners are more certain of their answers.
- Learners are more willing to give speculative answers.
- The frequency of learner questions increases.

Generally, you should wait *at least 3 seconds* before asking another question, repeating the previous question, or calling on another student. During indirect instruction, when divergent questions may require thinking through and weighing alternatives, *up to 15 seconds* of wait time may be appropriate.

These research findings provide impressive testimony to the important effect that wait time can have on your learners' responses. If only one piece of advice were given to beginning teachers concerning wait time, it would be to slow down and pause longer between questions and answers. See In Practice: Focus on Effective Classroom Questioning.

Finally, remember that questioning is a principal means of engaging students in the learning process, as it gets them to think through and problem solve with the material you are presenting. Following are suggestions for using questions to promote your learners' thinking and problem solving:

- *Plan the types of questions you will ask.* Although talk-show hosts make it appear as if their questions are spontaneous and unrehearsed, this seldom is the case. In reality, ad-libbing and spontaneity can lead to as much dead time on the air as they can in your classroom. The types of questions you select, their level of difficulty, and the sequence in which you ask them should be based on your lesson objectives.
- *Deliver questions in a style that is concise, clear, and to the point.* Effective oral questions are like effective writing: Every word is needed. Pose questions in the same natural, conversational language you would use in talking with a friend.
- *Allow time for students to think (wait-time 1).* Research on question asking points to the fact that many teachers do not allow learners sufficient time to answer a question before calling on someone else or moving to the next question. Gage and Berliner (1998) report that on average, teachers wait only about 1 second for learners to respond. These researchers recommend that increasing wait time to 3 to 4 seconds for lower-level questions and to as much as 15 seconds for higher-level questions.
- *Keep students in suspense.* First deliver the question, and then mention a student's name. Similarly, randomly select the students you want to answer your questions. You want your learners to anticipate that they can be called on at any time. This both increases accountability and maintains attention and alertness.

- *Give the student sufficient time to complete his or her response before redirecting the question or probing (wait-time 2).* Wait-time 2 is the time you wait following a student's answer before probing for deeper understanding or redirecting the question when the answer is incomplete or wrong. Teachers who make a deliberate effort to maintain lesson momentum often interrupt before a learner has finished responding.
- *Provide immediate feedback to the learner.* A correct answer should be acknowledged and followed by encouragement, elaboration on the response, further probing, or another question. The important point is to communicate to the learner that you have heard and evaluated the answer. Often learners (unbeknown to the teacher) perceive that their answers have been ignored. Incorrect, incomplete, or inadequate answers should be followed by a probe or redirection of the question to another student. As discussed in the following section, research suggests that learners of different achievement levels, socioeconomic levels, and cultures benefit from different questioning, redirecting, and probing techniques.

WHAT IS CULTURALLY RESPONSIVE QUESTIONING?

Sociolinguistics is the study of how cultural groups differ in the courtesies and conventions of language, rather than in the grammatical structure of what is said. Sociolinguistics examines the rules of **culture-specific questioning** that govern social conversation: with whom to speak, in what manner, when to pause, when to ask and answer questions, how to interrupt a speaker, and so on. Sociolinguists study, for example, aspects of communication as revealed by the average length of utterances, time between utterances, speech rhythms, and rules for when, how, and about what people converse.

Researchers have pointed out that classrooms and schools are governed by linguistic, sociocultural, and social interaction codes that can diverge from those found in the homes, peers, and communities of immigrant children. Delgado-Gaitan (2006) and Delgado-Gaitan and Trueba (1991), for example, point out that pedagogical practices in the schools they studied in California contradicted culturally sanctioned patterns of sharing, leadership, and oral storytelling among Mexican American students. Rather than change interaction patterns to accommodate the students, teachers in mainstreamed classes attributed students' lower performance to "deficiencies" and insisted on Anglo norms of interaction that were at odds with the students' culture. Among the aspects of communication and interaction most frequently studied are wait time, rhythm, participation structure, and language (Minami & Ovando, 2003).

Wait Time

Tharp (1989) reports that different cultures often have different wait times. Navajo children, for example, are raised in a culture that allows longer responses (wait-time 2) than Anglo culture. Some studies show that Navajo children speak in longer sentences and volunteer more answers when given more time to respond. In contrast, Tharp reports that in Hawaiian culture, interrupting is a sign of interest in the speaker and in what he or she is saying. Conversely, a long wait-time 2 suggests to Hawaiian learners that the speaker is uninterested or bored with the conversation.

Other studies of Hispanic and African American learners appear to suggest that optimal wait times are culture and even context specific (Hill, 1989). Although this research does not make specific prescriptions, it does suggest that teachers must determine how to pose a question and the appropriate wait time between questions and answers within the cultural context and learning history of their learners.

Rhythm

Conversational *rhythm* pertains to the tempo, inflections, and speed of conversations between two speakers. Young (1970) and Piestrup (1973) were among the first to observe that African American children and their mothers converse using rapid rhythms and a "contest" style of interaction. Mothers encourage their children to be assertive. Directions for household chores and children's responses to them take on an almost debate-like tone with the mother directing or calling and the children responding. Tannen (2005), Auer, Couper-Kuhlen, and Muller (1999), and Franklin (1992) suggest that this style of interaction creates a high-energy, fast-paced home environment, which contrasts with the low-energy, slow-paced environment of the typical classroom.

Franklin (1992) speculates that this contrast between the pace of conversation at home and in school may be one reason some African American children are inappropriately referred for behavior problems in the classroom. Similarly, M. G. Anderson (1992) states that many Anglo teachers overreact to the conversational style of African American adolescents, which may explain the disproportionate referral of these children to programs for learners with behavior disorders. Anderson recommends that teachers allow African American learners to use in the classroom the conversational style they bring from home. This includes speaking more rhythmically, displaying greater variation in intonation, and engaging in more fast-paced verbal interplay.

Participation Structure

The typical classroom conversation occurs in a one-to-one, question-and-answer structure or format. The teacher looks directly at a student, asks him or her a question, and waits for an answer before making a follow-up response. Tharp and Gallimore (1991) observe that such a participation structure results in very little participation by Hawaiian and Navajo children. For these children, both at home and in the community, the typical participation structure when adults are present involves a relatively small group of children together with an encouraging, participating, but nondirective adult in an informal setting. In research, when the classroom participation structures were based on those found in their cultures, both Hawaiian and Navajo children, who rarely participated in classroom discussions or question-and-answer formats, became surprisingly verbal.

Sociolinguists point out that children are more comfortable in classrooms where the sociolinguistic patterns (wait times, rhythms, participation structures, etc.) are compatible with those of their home and community. Some teachers and schools may view African American and Hispanic children as less verbal (Delgado-Gaitan, 2006; Delgado-Gaitan & Trueba, 1991). Yet when observed in a familiar home or neighborhood environment, they use vibrant, expressive, and creative language patterns. Researchers have observed that the sociolinguistic patterns of the typical U.S. classroom make certain minority-group learners uncomfortable. This in turn causes those learners to participate less in class, to participate in ways that Anglo American teachers view as deficient or inappropriate, and to achieve less. Supporting this finding, Gibson (1991) concludes that immigrant children's school success can be explained more by a strong home culture and positive sense of ethnic identity (which should be preserved at school) than by assimilation.

Language

Because much questioning is conducted in the formal language of the classroom, you should know your learners' language abilities. Approximately 5 million students—about 10% of the school-age population—have a primary language other than English. For some, English is their dominant language in the *receptive mode* (listening, reading); for others, English is their dominant language in the *expressive mode* (talking, writing).

It is not unusual to find bilingual learners who choose, for example, Spanish as their dominant means of speaking but English as their dominant means of listening (Banks & Banks, 2006; Moran & Hakuta, 2001). This allows the teacher to speak and be understood in English, even though at least some of the learners' communications to the teacher might be in Spanish. Knowing your learners' dominant means of expression will provide more opportunities to engage all of them in the learning process. If a learner does not use English as his or her dominant language, either in the expressive or receptive mode, and you do not speak the learner's language, you can do the following:

1. Emphasize other forms of communication—including the visual, kinesthetic, and tactile modalities—to supplement your teaching objectives, thus bringing a multisensory approach to your teaching.
2. Be sensitive to cultural differences. For example, providing frequent, meaningful praise and encouragement can set the stage for learning more efficiently than repeatedly reciting rules and warnings, which may not be fully understood by some of your learners.
3. Evaluate the reading level and format of the materials you use. When selecting or differentiating materials, you may find a Spanish version of comparable content and reading level. After a trial period, evaluate the materials again and adjust the reading level accordingly.
4. Do not confuse language proficiency with subject-matter achievement or ability. Bilingual children, in comparison to monolingual children, show superior performance on tests of analytical reasoning, concept formation, and cognitive flexibility. Other research shows that learners who are fluent in two or more languages have a better knowledge of language structure and detail, understand that words are arbitrary symbols for other words and actions, and can better detect grammatical errors in written and spoken communication (Galambos & Goldin-Meadow, 1990; Portes & Rumbaut, 2006). It is also important to note that some early researchers suggested that children from economically impoverished areas who speak a nonstandard form of English (e.g., Black English) may suffer impaired cognitive development as a result. But this hypothesis has been conclusively refuted (Masahiko & Ovando, 2001; Poplack, 2000). We now know that all languages, including dialects and other forms of nonstandard English, are equally complex and equally effective for use in learning and problem solving (Oakes & Lipton, 2006). Linguists have demonstrated that languages cannot be ranked in terms of intellectual sophistication. Consequently, intellectual impairment or slow cognitive development cannot result from the primary language a learner speaks, regardless of how nonstandard that language is.

WHAT ARE COMMON PROBLEMS IN USING QUESTIONS?

Based on classroom observations of the question-asking behavior of beginning teachers, here are some of the most frequently observed problems to watch for, along with suggested remedies.

Do You Use Complex, Ambiguous, or Double Questions?

One of the most common question-asking problems of beginning teachers involves use of the complex, ambiguous, or double question. This is a question so long and complicated that students have easily lost track of the main idea by the time they have heard the entire question. Sometimes a teacher unknowingly packs two (or even more) questions within this complicated structure.

Because such a question is delivered orally and not written, students have no way of rereading the question to gain its full intent. It is unfortunate that this type of question sometimes is so complicated that even the teacher cannot repeat it precisely when

requested, thus providing different versions of the same question. Consider the following three examples of needlessly complex questions and their simpler but equally effective revisions:

Example 1

Complex form: "We all know what the three branches of government are, but where did they come from, how were they devised, and in what manner do they relate?"

This question is actually three questions in one and requires too long a response if each point in the question is to be responded to individually. In addition, the first two questions may be redundant (or are they?), and the third is sufficiently vague to bewilder most students. Finally, what if some students do not know or cannot recall the three branches of government? For those students, everything that follows is irrelevant, opening the door to boredom and off-task behavior.

Simpler form: "Recall that there are three branches of government: the executive, judicial, and legislative. What governmental functions are assigned to each branch by the Constitution?"

Example 2

Complex form: "How do single-celled animals propagate themselves and divide up to create similar forms of animal life that look like them?"

If you were to ask this question, some of your students surely would ask you to repeat it, in which case you might not remember your own complex wording. This question fails to get to the point quickly and appears to ask the same thing three times: "How do single-celled animals propagate . . . divide up . . . create similar forms of animal life?" This redundancy could easily be mistaken as asking three separate questions by students struggling to understand single-celled reproduction at an elementary level. State your question in only one way and rephrase it later, if need be, when students know the same question is being rephrased.

Simpler form: "By what process do single-celled animals reproduce?"

Example 3

Complex form: "What do you think about the Civil War, the Iraq War, or war in general?"

Depending on what part of this question students want to hear, you may get noticeably different answers. The intention is to ask a question that will provide enough options to get almost any student involved in composing a response, but unless you intend only to start a controversy, the range of responses will probably be so broad that moving to the next point will be impossible. This question may leave students arguing feverishly for the entire period, without being able to focus on the real purpose for raising the question in the first place (e.g., as an introduction to the Civil War, to unpopular wars, or to the concept of *war*). This question is too broad, too open, and too divergent to be of practical value for framing a day's lesson.

Simpler form: "What factors justify a war among groups within the same nation?"

Here are basic rules for avoiding complex, ambiguous, or double questions:

- Focus each question on only one idea.
- State the main idea only once.
- Use concrete language.
- State the question in as few words as possible.

Do You Accept Only the Answers You Expect?

Another common mistake of beginning teachers is to accept almost exclusively the answers they expect. Recall the discussion in Chapter 2 regarding the bias that teachers sometimes have about whom they call on and interact with in classroom exchanges. Bias can extend to favorite answers as well as to favorite students. When teaching new content, you naturally strive to become more secure and confident by limiting the answers to those with which you are most familiar. Your first reaction will be to discourage responses at the edge of what you consider to be the appropriate range. This range is directly related to the openness of your questions. Open questions encourage diversity, and it is this diversity that often catches the beginning teacher off guard and forces an expansive question into a limited one. Note in the following dialogue how this teacher's posture is changed by the nature of the response:

Teacher: OK, today we will study the European settlers who came to America and why they came here. Why did they come to America?
Student 1: To farm.
Teacher: No, not to farm.
Student 2: To build houses and churches.
Teacher: No, that's not right either.

If this exchange were to continue for very long, it would no doubt turn off many students, if only because they know their responses cannot be entirely wrong, even if they are not what the teacher wants. What *does* the teacher want? The desired answer is probably that the early settlers came to America because of religious persecution in their European communities. The last student's response, "To build houses and churches," was a perfect opportunity for a probe that simply asked "Why churches?" Unfortunately, this teacher missed that opportunity in favor of waiting for the exact response, because he or she was unable or unwilling to build on the existing responses. This teacher may have a long wait, in which case valuable instructional time may be lost by calling on student after student in the hope that the single acceptable answer will eventually emerge.

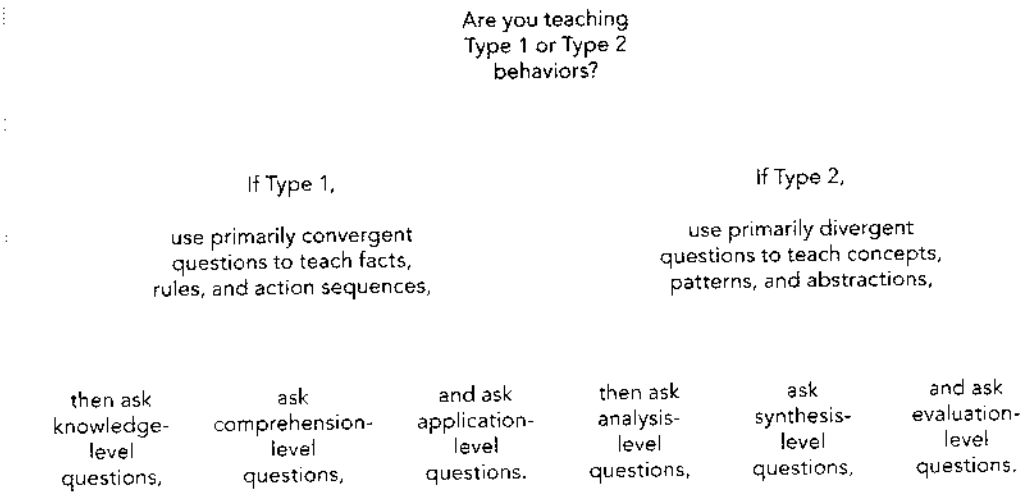
Answers that are just what you are looking for are always desirable, but remember that partially correct answers and even unusual and unexpected ones can become effective additions to the discussion through the use of probes. The solution to this problem is to use probes that build gradually toward your targeted responses.

Why Are You Asking This Question?

Perhaps the most serious fault of all in question asking is not being certain of why you are asking a question. Remember, questions are tools that support the teaching and learning processes. Thus your first decision in composing questions is to determine whether your lesson is teaching facts, rules, and action sequences or concepts, patterns, and abstractions. If the former is your goal, compose convergent questions at the knowledge, comprehension, and application levels. If the latter is your goal, then ask divergent questions at the analysis, synthesis, and evaluation levels. This decision strategy is summarized in Figure 9.1.

If you have not determined where you are on Figure 9.1, you will likely ask the wrong types of questions, and your questions will lack logical sequence. They may jump from convergent to divergent and move back and forth from the simple recall of facts to the acquisition of concepts and patterns. Your students will find your questions disconcerting, because your ideas will not be linked by any common thread (at least, not by one they can follow), and you will be seen as vague or lacking the ability to connect content in meaningful ways. Therefore it is important that you decide in advance where your questioning strategy is going and then move toward this goal by choosing appropriate questions and levels of cognitive complexity.

Figure 9.1 Decision Tree for Deciding Types of Questions to Ask



Finally, it is important to note that just because your goal may be Type 1 or Type 2 behaviors, this does not mean you cannot vary your questioning strategy across the levels shown in Figure 9.1. Questions should vary across types of learning (e.g., from knowledge to application or from analysis to synthesis). Keep in mind your ultimate goal for the lesson, and choose the best combination of questions to reach that goal.

Do You Answer the Question Yourself?

Another common problem is posing a question and then answering it yourself. Sometimes a student begins a response but is cut off, only to hear the remainder of the response supplied by the teacher:

Teacher: So who was the president who freed the slaves?
Student: Abraham—
Teacher: Lincoln! Yes, that's right.

Sometimes the reverse occurs: A student begins a response that the teacher knows is wrong and then is cut off by the teacher, who gives the correct response:

Teacher: So who was the president who freed the slaves?
Student: George—
Teacher: No, no! It was Abraham Lincoln.

Needless to say, both outcomes demoralize the student, who either is deprived of the chance to give a complete right answer or is shown to have a response so incorrect that it is not even worth hearing in its entirety. Neither of these outcomes may be intended, but this is how your students will see it.

Your job is to use student responses to build to other more complex outcomes. Probes to elicit new information, to go beyond an already correct answer, and to provide hints and clues after a wrong answer are particularly useful, because they extend to your students the right to give a full and deliberate response—right or wrong. Teachers who frequently interrupt student responses because of a desire for perfect answers, a dominant personality, or talkativeness may ultimately produce frustrated learners who never learn to give full and thoughtful responses or to participate voluntarily.

Do You Use Questions as Punishment?

Our final problem, and perhaps the most difficult, is the use—or rather abuse—of questions to punish or to put students on the defensive. Being asked a question can be a punishment as well as a reward. For example, questions can be used as punishment in the following ways:

1. A student who forgot to do the homework is deliberately asked a question from that homework.
2. A student who never volunteers is always asked questions.
3. A student gives a wrong response and then is asked an even harder question.
4. A student who disrupts the class is asked a question for which the answer cannot possibly be known.
5. A student who gives a careless response is asked four questions in a row.

Nearly every teacher has, at one time or another, used questions in one or more of these ways. Interestingly, some teachers do not always see these uses as punishment. Regardless of intent, however, such questions are punishment in that they (1) are unlikely to engage the student actively in meaningful learning and (2) leave the student with a worse self-image, less confidence, and more anxiety (perhaps even anger) than before. These are behaviors that can only impede the learning process and therefore have no place in your repertoire of questioning strategies. Each of the student-centered problems reflected in the preceding examples could have been handled more effectively by doing one of these things:

1. Making a list of students who do not do homework
2. Providing example questions beforehand to students who never volunteer
3. Giving another try and providing hints and clues to students who give wrong responses until they give partially correct answers
4. Assigning disciplinary warnings or reprimands to students who disrupt class
5. Passing quickly to another student after receiving a careless answer from a student

Ample means are available for dealing with misbehavior, and such means are far more effective than using questions. Questions are instructional tools that should be prized and protected for their chosen purpose. To misuse them or to use them for any other purpose may affect how your students perceive your questions ("Did I get the hard question because the teacher thinks I'm smart or because I'm being punished?"). Such conflicts can drain students of the energy and concentration needed to answer your questions and may forever cast doubts on your motives.

Conversely, questions can be implicit rewards when used correctly. The opportunity to shine, to know and display the correct answer in front of others, and to be tested and get an approving grade are rewarding experiences for any learner. Consequently, every learner, regardless of ability level or knowledge of a correct response, should periodically have these experiences.

Do not ignore students who have difficulty responding, and do not accept wrong answers. Instead, occasionally try a broader criterion than correct/incorrect to help all students share in the emotional and intellectual rewards of answering questions. For example, try rewarding the most novel, most futuristic, most practical, and most thought-provoking answers along with the most accurate response. This will let every learner share in the challenge and excitement of answering questions.

Thus questioning is another tool that can be used to differentiate your instruction and add to your teaching menu. Because of the almost endless variety of questions, using them may well be the most flexible tool on your menu.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 9 content. After reading the case history, go to Chapter 9 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Mr. Cole's middle school science class is heterogeneous in many ways. There is an ethnic and racial mix of Anglo, Hispanic, and African American students and a small number of Asian American students. Several are recent immigrants who understand and read English better than they speak it. Ability levels run from very low to high, with a large portion of students being in the middle. Currently, the class is studying the effects of invention and discovery on society:

Mr. Cole: My great uncle played football in college. But when he was in his twenties, he got pneumonia and died in three days. Could that happen today, Carla?

Carla: Well, my grandfather died of pneumonia last winter, but I don't think it happened that fast. I guess it could happen.

Mr. Cole: You're probably right, Carla. People still die from diseases like pneumonia, especially if they are elderly and have another illness. Maybe that was true with your grandfather?

Carla: [Her eyes wide with surprise.] He was sick for a long time.

Mr. Cole: But what about healthy athletes in their twenties? Do many of them die from pneumonia today? What do you think, Thomas?

Thomas: No, today we just give them antibiotics, and they get well pretty fast. I get your hint, Mr. Cole. Antibiotics are another invention that has really helped society.

Curtis: I had bronchitis last year, and the antibiotics didn't seem to help much at all. They aren't that great, in my opinion.

Ramona: My baby sister gets ear infections, and the medicine used to clear them up right away. But now, it doesn't help all that much.

Mr. Cole: So I see some of you have mixed experiences with antibiotics. Why do you think that is? Millie, you have your hand up. What do you think?

Millie: I saw this program on TV a couple of weeks ago that said we take antibiotics too much and that's why they don't work as well now. Some germs have gotten used to them. There are some kinds of infections now that don't go away with antibiotics anymore.

Mr. Cole: Maybe there can be too much of a good thing, then. Could it be that some inventions seem good at first, but after awhile, we see that maybe they solve one problem and create another? Antibiotics cure simple pneumonia, but they can also produce what are called *resistive strains,* which are even more difficult to kill. Let's think about some other inventions that also created problems as well as solved them. I'll give you some time to think of a good example. [Thirty seconds goes by.] Jason, what have you thought of?

Jason: Well, what about cars? Sure, we can get around a lot better, but they cause a lot of pollution, too.

Curtis: Not to mention all the people who die in accidents each year.

Millie: I say computers. Some people are addicted to the Internet and don't spend time with their family anymore. Plus people get a lot of junk e-mail they don't want.

Thomas: It really creeps me out to get a phone call from a computer. I mean, people selling you stuff on the telephone is bad enough, but a computer . . .

Millie: What about that time the computer here at school gave everybody "incompletes" by mistake? [The class groans in remembrance.]

SUMMING UP

The main points in this chapter include the following:

What Is a Question?

1. An effective question is one for which students actively compose a response and thereby become engaged in the learning process.
2. An effective question depends on voice inflection, word emphasis, word choice, and the context in which it is raised.
3. The three most commonly observed teacher behaviors in the classroom are structuring, soliciting, and reacting.
4. *Soliciting*—or question-asking behavior—encourages students to act on and think about the structured material as quickly as possible after it has been presented.
5. It has been estimated that 70% to 80% of all questions require the simple recall of facts, but only 20% to 30% require clarifying, expanding, generalizing, and making inferences. In other words, as few as one of every five questions may require higher-level thought processes, even though behaviors at the higher levels of cognitive complexity are among those most frequently required in adult life, at work, and in advanced training.

What Are the Purposes of Questions?

6. Common purposes for asking questions include the following:
   - Getting interest and attention
   - Diagnosing and checking
   - Recalling specific facts or information
   - Managing
   - Encouraging higher-level thought processes
   - Structuring and redirecting learning
   - Allowing expression of affect

What Are Convergent and Divergent Questions?

7. A question that limits possible responses to one or a small number is called a *convergent, direct,* or *closed question.* This type of question teaches the learner to respond in a limited, restrictive manner.
8. A question that has many right answers or a broad range of acceptable responses is called a *divergent, indirect,* or *open question.* Divergent questions, however, can have wrong answers.
9. The same question can be convergent under one set of circumstances and divergent under another, as when so-called creative answers to a divergent question have been memorized from a list.
10. Research has not shown that the use of higher-order questions is related to improved performance on standardized achievement tests. However, higher-order questions have been found to elicit analysis, synthesis, and evaluation skills, which are among the skills most sought in adult life.

Who Are the Targets of Questions?

11. Questions can be specifically worded for cognitive complexity as well as directed to individuals, groups, or the entire class.

What Sequences of Questions Are Used?

12. Questions may be used in the context of many different sequences, such as *funneling,* where increasingly specific conditions are added to an original question, narrowing it to one that requires simple deduction.

What Levels of Questions Are Used?

13. In addition to being divergent or convergent and targeted to specific types of learners, questions can be formulated at different levels of cognitive complexity, including the knowledge, comprehension, application, analysis, synthesis, and evaluation levels of the cognitive domain.
14. Knowledge questions ask the learner to recall, describe, define, or recognize facts that already have been committed to memory.

15. Comprehension questions ask the learner to explain, summarize, or elaborate on previously learned facts.
16. Application questions ask the learner to go beyond the memorization of facts and their translation and to use previously acquired facts and understandings in a new and different environment.
17. Analysis questions ask the learner to break a problem into its component parts and to recognize a relationship among the parts.
18. Synthesis questions ask the learner to design or produce a unique or unusual response to an unfamiliar problem.
19. Evaluation questions ask the learner to form judgments and make decisions, using stated criteria for determining the adequacy of the response.

What Is a Probe?

20. A *probe* is a question that immediately follows a student's response to a question; its purpose is to elicit clarification, to solicit new information, or to redirect or restructure a student's response.
21. The key to probing for new information is to make the follow-up question only a small extension of the previous question.

How Should Wait Time Be Used?

22. The time you wait before initiating another question or turning to another student may be as important in actively engaging the learner in the learning process as the question itself. Teachers should observe a wait time of at least 3 seconds before asking another question, repeating the previous question, or calling on another student.
23. Longer wait times have been associated with longer responses, greater numbers of voluntary responses, greater behavioral complexity of responses, greater frequency of student questions, and increased confidence in responding.

What Is Culturally Responsive Questioning?

24. Researchers point out that classrooms and schools are governed by linguistic, sociocultural, and social interaction patterns that can diverge from those found in the homes, peers, and communities of immigrant children.
25. *Cultural-specific questions* are those that take into account the wait time, rhythm, participation structure, and primary means of expression predominant in a given culture.

What Are Common Problems in Using Questions?

26. To avoid the problems commonly observed in the question-asking behavior of beginning teachers, do the following:
    - Do not ask overly complex or ambiguous questions, which may require several different answers.
    - Be prepared to expect correct but unusual answers, especially when raising divergent questions.
    - Always establish beforehand why you are asking a particular question. Know the complexity of behavior you may expect as a result of asking the question.
    - Never supply the correct answer to your own question without first probing. Never prevent a student from completing a response to a question, even if incorrect. Use a partially correct or wrong answer as a platform for eliciting clarification, soliciting new information, or redirecting.
    - Never use questions as a form of embarrassment or punishment. Such misuse of questions rarely changes misbehavior. Moreover, questioning is an academic tool that should be prized and protected for its chosen purpose. To misuse questioning or to use it for any other purpose may affect how your students perceive your questions.

KEY TERMS

Convergent question, 300
Culture-specific questioning, 316
Divergent question, 300
Effective questions, 298
Eliciting probes, 311
Probe, 310
Question sequence, 303
Reacting, 298
Redirecting probes, 311
Sociolinguistics, 316
Soliciting, 298
Soliciting probes, 311
Structuring, 298
Wait-time 1, 313
Wait-time 2, 313

DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. What is the definition of an *effective question,* as used in this chapter? Provide a question that you believe represents this definition.
*2. Approximately what percentage of all school time may be devoted to questions and answers? What is your opinion as to why this percentage is so high?
*3. Approximately what percentage of questions asked requires the simple recall of facts, and approximately what percentage requires clarifying, expanding, generalizing, and making inferences? What is your opinion as to why the latter percentage is so low?
*4. In your own words, what is a *convergent question* and what is a *divergent question?* Address how they are alike and different with respect to right answers and wrong answers.
5. Using the same question content, give an example of both a convergent and a divergent question.
*6. According to research, how does the asking of higher-order questions affect (a) a learner's standardized achievement score and (b) a learner's use of analysis, synthesis, and evaluation skills in thinking through a problem?
7. Compose a question that is more cognitively complex and another that is less cognitively complex. How do these two questions differ in cues, hints, and advance organizers?
8. Using Table 9.2 as a guide, compose a sequence of related questions that extend and lift student responses.
9. Using the same content as in Question 8, prepare one question that elicits the appropriate level of behavioral complexity at each level of the cognitive domain—knowledge, comprehension, application, analysis, synthesis, and evaluation.
*10. What is meant by the term *wait time?* Generally speaking, why should beginning teachers work to increase their wait time?
*11. Identify and give examples of the five most troublesome question-asking problems for beginning teachers. Which problem do you have most often?

PROFESSIONAL PRACTICE

Field Experience and Practice Activities

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B.

1. From your fieldwork or observation, provide examples of what a teacher said to (a) structure a topic to be discussed, (b) solicit a student response, and (c) react to the student's response. For a topic you will be teaching, show how this chain of events would unfold using a brief teacher and student dialogue.
*2. List the seven specific purposes for asking questions. Then, give examples of questions that represent three of the most popular purposes you have observed. Identify any you have observed that are not among the seven.
*3. Write a brief classroom dialogue of teacher questions and student responses that illustrates the funneling of student responses.
4. From a classroom dialogue you have observed, provide one example each of probes that (a) elicit clarification, (b) solicit new information, and (c) redirect or restructure a student's response. In which order did these occur?

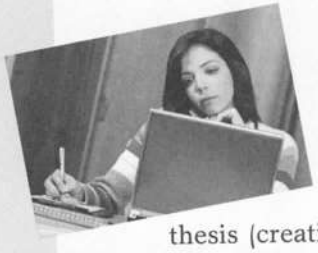
5. From your fieldwork or observation, recall three questions that you would consider culturally responsive. Explain why.

Digital Portfolio Activities

The following digital portfolio activities relate to INTASC principles 4, 5, and 6.

1. In Field Experience and Practice Activity 2, you were asked to give examples of the seven purposes for asking questions. From this chapter, identify one example question for each of the seven purposes, and place all of the examples into your digital portfolio in a folder labeled "Questioning Strategies." Your example questions will be valuable reminders of the variety of ways in which questions can shape and set up a student's response to more accurately reveal what he or she does and does not know. These examples will also provide a future reference for you during lesson and unit planning.
2. Prepare one question each at the knowledge, comprehension, application, analysis, synthesis, and evaluation levels for a subject you will teach. Place these questions in the "Questioning Strategies" folder of your digital portfolio, and refer to them as models of questions that elicit increasingly complex learning outcomes.

Classroom Observation Activity



The following classroom observation activity relates to INTASC principles 4, 5, and 6.

One of the most popular ways to discriminate among different types of questions is to consider the six levels of student outcomes a question can elicit: knowledge (remembering), comprehension (understanding), application (transferring), analysis (relating), synthesis (creating), and evaluation (judging). Go to Chapter 9 in the Book Specific Resources section in the MyEducationLab for your course. Select the Classroom Observation section and Observation Activity 9.1, titled Distinguishing among Six Types of Questions. You will notice that these six types of questions are grouped into lower-order questions (comprising knowledge, comprehension, and application) and higher-order questions (comprising analysis, synthesis, and evaluation). The form also provides the opportunity to record the amount of time a teacher waits (wait time) between the question and student response before answering the question or moving on to another student. Use this form to record the numbers and levels of questions in either a school or university classroom, as well as your observed wait times. If you observe in both a school and a university classroom, compare your results to see if more higher-order questions are used in one setting over the other and how the wait times differ. Place this record in your "Questioning Strategies" folder for use in future classroom observations.

10

This chapter will help you answer these questions and meet the following INTASC principles for effective teaching.

1. How can I get my learners to unleash their imaginative and intuitive capacities through self-directed learning?
2. How do I get learners to accept responsibility for their own learning?
3. How can I teach my learners to go beyond the content given—to think critically, reason, and problem solve?
4. How can I engage my learners in project-based learning?
5. How can I promote the goals of self-directed learning using differentiated instruction?

INTASC

principle 1 The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of subject matter meaningful for students.

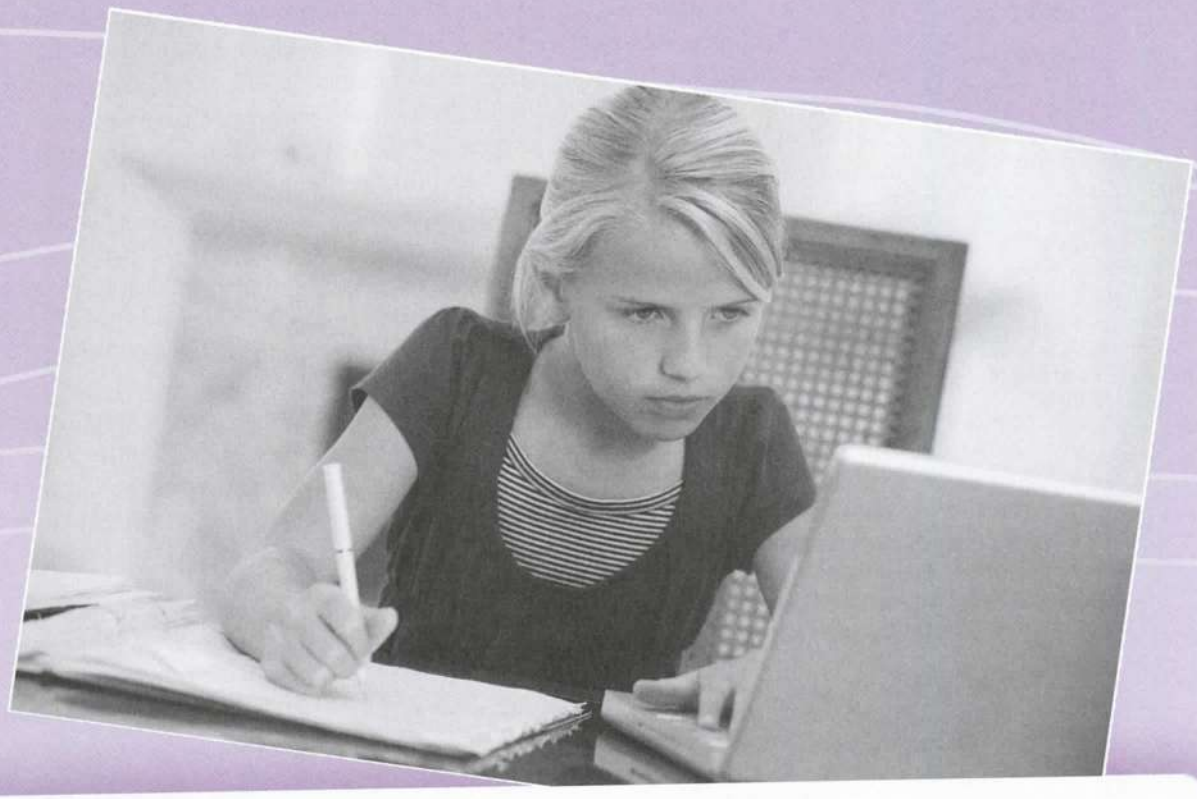
principle 2 The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.

principle 3 The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.

principle 4 The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.

principle 6 The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

Self-Directed Learning



In this chapter, you will study an important method for engaging your students in the learning process. Here you will learn how to teach learners to go beyond the content given—to think critically, reason, and problem solve—by using a self-directed approach to learning. You will see how to use self-directed strategies to actively engage your students in the learning process and to help them acquire the reasoning, critical-thinking, and problem-solving skills required in today's complex society.

SELF-DIRECTED LEARNING

Much of today's classroom learning is focused on activities by which the learner acquires facts, rules, and action sequences. The majority of lessons require outcomes only at the lower levels of cognition: knowledge, comprehension, and application. This may explain why some national studies of the state of education in the United States (American Association for the Advancement of Science, 1996, 2005; National Council for the Social Studies, 2002, 2006; National Council of Teachers of English, 1996, 2006; National Council of Teachers of Mathematics, 2000, 2005) found many students unable to think independently of the teacher or to go beyond the content in their texts and workbooks. These studies suggest that the manner in which most schooling occurs may not be teaching students to become aware of their own learning, to think critically, and to derive their own patterns of thought and meaning from the content presented, as suggested by the cognitive outcomes identified in the Higher-Order Thinking and Problem-Solving Checklist in Appendix C (Beyer, 1995; Borich & Tombari, 2004; Hester, 1994).

Self-directed learning is an approach to both teaching and learning that actively engages students in the learning process to acquire higher-order thinking skills. Self-directed learning helps students construct their own understanding and meaning and helps them to reason, problem solve, and think critically about the content (Burke, 2006; Costa & Kallick, 2003; Keirns, 1998). Self-directed learning requires you to perform this sequence of activities:

1. Provide information about when and how to use mental strategies for learning.
2. Explicitly illustrate how to use these strategies to think through solutions to real-world problems.
3. Encourage your learners to become actively involved in the subject matter by going beyond the information given—to restructure it based on their own ways of thinking and prior understandings.
4. Gradually shift the responsibility for learning to your students through practice exercises, question-and-answer dialogues, and/or discussions that engage them in increasingly complex thought patterns.

Consider the following excerpt, which illustrates how some of these teaching functions might be accomplished in a typical lesson:

Teacher: [A poem has been written on the board; the teacher reads it to the class.]

Man is but a mortal fool
When it's hot, he wants it cool
When it's cool, he wants it hot
He's always wanting what is not.

Today I want to illustrate some ways to understand a poem like the one I've just read. This may seem like a simple poem, but its author put a lot of meaning into each of its words. Now let me give you an approach to studying poems like this and gaining from them the meanings intended by their authors. First let's identify the key words in this poem. Earl, what do you think are some of the most important words?

Earl: Well, I'd say the word *man* because it's the first.

Teacher: Any others? [Still looking at Earl.]

Earl: Not that I can see.

Teacher: Anita?

Anita: The words *hot* and *cool* have to be important, because they appear twice and they rhyme with the last words of the first and last lines.

Teacher: Any other key words? Rick?

Rick: Well, I think *a mortal fool* is supposed to be telling us something, but I don't know what.

Teacher: Good. So now we've identified some words we think are especially important for understanding this poem. Why don't we look up in the dictionary the meanings of any of these words we don't know or are unsure of? That will be our *second* step. Ted, look up the word *mortal* for us while we begin work on our third step. The *third* step is to paraphrase what you think this author is saying. Susan, can you paraphrase what he is saying?

Susan: I think he's saying we're always changing our minds, and that's why we look so stupid sometimes.

Teacher: We are all human, so we certainly change our minds a lot, don't we? Rhonda looks like she wants to say something. Rhonda?

Rhonda: Well, I'd say it's not that we're stupid that we change our minds but that it's just part of who we are. We can't help wanting what we can't have.

Teacher: So you've added a little something to Susan's interpretation. What do you think, Susan? Do you agree?

Susan: Yeah, we're not stupid; we're just mortals.

Teacher: Chris, do you want to add anything?

Chris: I'd say that we're not stupid at all. That to really enjoy something, we must have experienced its opposite. Otherwise we wouldn't know how good it is.

Teacher: Now that brings us to our *fourth* and last step. Let's try to relate what Chris just said to our own experience. Anyone ready? Earl?

Earl: I agree with Chris, because I remember thinking how much I welcomed winter because of how hot it was last summer.

Teacher: [Marcia is waving her hand.] Marcia, what do you have to say about that?

Marcia: But now that it's winter, I can't wait for the cold weather to end, so I can go swimming again. [Class nods in agreement.]

Teacher: It looks as though Chris was right. We sometimes have to see both sides of something—hot/cold, good/bad, light/dark—to fully appreciate it. Now Ted, what did you find for *mortal* in the dictionary?

Ted: It says "having caused or being about to cause death," "subject to death," and "marked by vulnerability."

Teacher: Which of those do you think best fits the use of *mortal fool* in our poem?

Ted: Well, hmm . . . the last one, because it kind of goes with what we have been saying about how we choose one thing and then another . . . like when we get too cold, we dream of summer, and then when summer comes, we think it's too hot.

Teacher: I agree. It fits with what we all have experienced in our lives—and that means we are on the right track to interpreting the poem as the author intended. Now let's go one step further. Putting all of our ideas together, what is this poet saying? [Nodding to Alex.]

Alex: Well, I'd say life's a kind of circle. We keep going around and around—back to where we've come and then trying to escape to where we've been. Maybe that's one kind of vulnerability—like it said in the dictionary.

Teacher: That's good thinking, Alex. Earl, because we began with you, I'll let you have the final word.

Earl: I think Alex got it, because now I understand why the author thinks we're all fools. We're like a dog going in circles chasing our tail, always wanting what we don't have. That explains the first and the last lines, doesn't it? Because we are human, we are vulnerable to always "wanting what is not." Yes, so we're mortal fools. I get it.

Teacher: Very good. Now let's think for a moment about the four steps we just went through to understand this poem. I will repeat them slowly while you write

them down. They will become your guide for reading the rest of the poems we study.

Notice how this teacher contributed something to each of the four components of self-directed learning. First she provided the learners with a mental strategy for learning—in this case, a framework of four easy-to-follow steps for interpreting poetry. These steps were sufficiently familiar and practical enough to be followed by almost any student, regardless of prior knowledge or experience. Notice that the steps were not just divisions of the task but steps that ultimately forced learners to go beyond the content presented to find their own meaning and understanding, based on personal experience and individual thinking. In other words, there were no wrong answers with this strategy—only answers that could be improved to lift the learner to the next rung of the learning ladder.

Second the strategy provided was not just routinely given to the learners by listing its steps on the board; the steps were illustrated in the context of a real problem. The application was real world and typical of other examples to which students would be asked to apply the strategy.

Third the learners were invited to become participants in the learning, not just passive listeners, waiting to be told what to do. Because the teacher started a question-and-answer dialogue to provide a structure for the learners' opinions and experiences, students became an active part of the process by which new knowledge was being generated. They were, in a sense, their own teachers without knowing it. This was made possible through the format of an unscripted discussion, which removed any fear of producing a wrong response that otherwise might have prevented some learners from participating.

And fourth, note that as the lesson evolved, more and more of the most important conclusions were provided by the students, not the teacher. The highest level of interpretation, with which the lesson ended, came almost entirely from the summarizing remarks of students. By the end of the lesson, the teacher's role was more that of a monitor and co-inquirer than an information provider; that role had been assumed by the students as they actively applied each of the steps given earlier in the lesson.

Now let's look more closely at some of the mental strategies that learners can actually use to acquire meaning and understanding from text.

Metacognition

One strategy for self-directed learning is **metacognition**, or mental processes that assist learners to reflect on their thinking by internalizing, understanding, and recalling the content to be learned. They include so-called invisible thinking skills—such as self-interrogation, self-checking, self-monitoring, and analyzing—as well as memory aids (called *mnemonics*) for classifying and recalling content.

Metacognitive strategies are most easily conveyed to learners through a process called *mental modeling* (Boyles, 2004; Duffy, Roehler, & Herrman, 1988; Dunlosky & Metcalf, 2008). **Mental modeling** helps students internalize, recall, and then generalize problem solutions to different content at a later time. The teacher does not just convey information but demonstrates the decision-making process as it occurs. By contrast, the mechanical memorization of steps rarely helps learners solve similar problems in other contexts or allows content to be recalled when the present topic has lost its immediate importance (e.g., no exam in sight, no homework due).

Mental modeling is particularly important when asking students to engage in complex tasks. For instance, an Internet search requires higher-order thinking skills to devise a search strategy, evaluate its result, discard inapplicable items, and synthesize findings. Each of these tasks poses a challenge for learners that can be addressed through modeling

ways for them to organize their thinking (Keene, 2007; Rekrut, 1999). As you observe in classrooms, you will want to watch for instances of mental modeling; note particularly effective approaches you see and how they help learners increase responsibility for their own learning by implementing and monitoring a previously modeled way of thinking.

Mental modeling involves three important steps (Duffy & Roehler, 1989):

1. Showing students the reasoning involved
2. Making students conscious of the reasoning involved
3. Focusing students on applying the reasoning

These steps usually are carried out through verbal statements that walk learners through the process of attaining a correct solution. They begin with verbal markers such as the following:

> Now, I will show you how to solve this problem by talking out loud as I go through it, identifying exactly what is going on in my mind. Think about each decision I make, where I stop to think, and what alternatives I choose—as though you are making the same decisions in your own mind.

Notice that the teacher is not giving learners the mechanics of getting a right answer: do step A, then B, then C. More importantly, the teacher is providing an actual live demonstration of the mental procedures that may underlie the routine completion of a problem.

Research on what makes a good demonstration (Borich & Tombari, 1997, 2004; Good & Brophy, 1995) indicates that skilled demonstrators of mental procedures do the following:

- *Focus learners' attention.* Effective demonstrators begin the demonstration only when their learners' attention is focused on them. Then they direct students' attention to the thinking or reasoning skill they want students to learn.
- *Stress the value of the demonstration.* Effective demonstrators briefly and concisely point out why their learners should observe what they are about to demonstrate. They relate the thinking skill to the content to be learned.
- *Talk in conversational language while demonstrating.* Effective demonstrators back up to cover unfamiliar concepts and repeat actions when needed, use analogies to bridge content gaps, and use examples to reinforce learning. They then probe for understanding.
- *Make the steps simple and obvious.* Effective demonstrators break complex actions into simple steps that can be followed one at a time. They point out what to do next and then describe the action as it is being performed by thinking out loud while acting.
- *Help learners remember the demonstration.* Effective demonstrators go slowly ("Stop me if I'm going too fast"), emphasize certain actions ("Now I'll ask myself a question"), highlight distinctive features ("Notice where I pause"), and give simple memory aids to help learners retain what they have seen and heard.

These mental procedures help students internalize, recall, and then generalize problem solutions to different content at a later time. Effective demonstrators do not just convey information according to the preceding steps but actually demonstrate the decision-making process as it occurs within their own thoughts. They then monitor the process as it occurs in the learner, provide feedback, and adjust the complexity and flow of content as needed. This leads to a second important concept for self-directed learning, which is *mediation.*

T

The on-the-spot adjustments to content flow and complexity that you make to accommodate individual learning needs are called *teacher mediation.* Your role during **teacher-mediated learning** is to adjust the instructional dialogue to help students restructure

their learning and move them closer to the intended outcome. In other words, the interactive dialogue you provide helps learners construct their own meaning from the content. This aids retention and the generalization of the reasoning process to other contexts.

The knowledge and skills that learners are to acquire are not given to them in the form of finished products. Instead you provide cognitive stimulation at just the proper times for students to acquire the end products through their own reasoning. The need to adjust both the flow and the content seldom can be anticipated. It requires mediation—your on-the-spot judgment of what new information will bring a learner's response to the next level of which he or she is capable at that moment. This next level reflects the content difficulty and cognitive complexity from which the student can most benefit at that moment.

The Zone of Maximum Response Opportunity

This level of content difficulty and cognitive complexity is the learner's **zone of maximum response opportunity** (Kozulin, Gindis, Ageyev, & Miller, 2003; Vygotsky & Kozulin, 1986).* It is the zone of behavior that, if stimulated by you, will bring a learner's response to the next level of refinement. Thus a response directed at the zone of maximum response opportunity must be at or near the learner's current level of understanding but also designed to lift his or her following response to the next higher level. Your directed response need not elicit the correct answer, because at that precise moment, the learner may be incapable of benefiting from it. It should, however, encourage the learner to refine an initially crude response.

Following are two classroom dialogues. Note that the first teacher hits the learner's zone of maximum response opportunity, but the second teacher misses it:

Teacher: When you see a proportion or ratio, such as 4:5 [writes it on board], think of the number on top as "what is" and the number on the bottom as "what could be." Think about a box of cereal that you have for breakfast. If I wrote the proportion of cereal in the box as 3:4 [writes it on board], I would say to myself, "The full box is equal to the number 4—that's the 'what could be' part. But this morning, after I fixed my breakfast, what's left is only the number 3, which is the 'what is' part. That's how I can tell the box is still pretty full, because the number for 'what is' is close to the number for 'what could be.'"

Now Megan, explain to me what it means when it says on a label that the proportion of vitamin C for one 4-ounce glass of orange juice is half the minimum daily requirement.

Megan: I'm not sure.

Teacher: OK, what words can we use to describe the number on top?

Megan: You said it's "what is."

Teacher: What does that mean?

Megan: I guess it's how much vitamin C is really in the glass.

Teacher: And now for the bottom?

Megan: You said the bottom is "what could be." Does that mean that it's all you need?

Teacher: Yes, it does—good. Now think of another example—one of your own—in which something was less than it could have been.

Megan: Well, I finished Ms. Enro's social studies test before the end of the period.

Teacher: And how long was the period?

Megan: Umm, about 40 minutes, I guess.

*The zone of maximum response opportunity is called the "zone of proximal development" by Vygotsky (Kozulin, 1990).

Video Window

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Demonstrating

In this video, you will see Scott presenting a science demonstration to his middle school students. Watch how he engages all of his students in the demonstration, giving them a sense of ownership by letting them experience for themselves the scientific principle being studied and thereby heightening their curiosity and motivation to learn more. Find instances in which Scott applies the following criteria for presenting an effective demonstration:

- Focuses his learners' attention
- Stresses the value of the demonstration
- Talks in conversational language while demonstrating
- Makes the steps simple and obvious
- Helps learners remember the demonstration

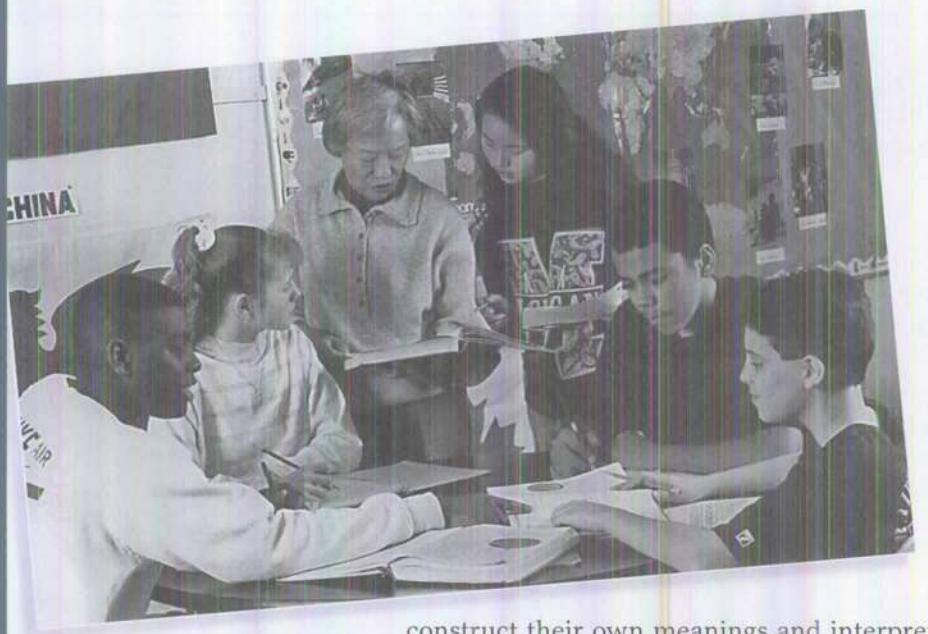
Go to the Video Example section of Topic 7: "Strategies for Teaching" in the MyEducationLab for your course to view the video "Demonstrating."

Teacher: Using our words, what would you call that part of the problem?
Megan: "What could be." OK, I get it. Then the time I actually took is what really happened? Yeah, I finished the test in about 20 minutes.
Teacher: So how would you express that proportion in numbers?
Megan: It would be 20, for "what is," over 40, for "what could be." The top is half of the bottom, so I guess one glass of orange juice gives you half the vitamin C you need in a day.
Teacher: OK. Let's retrace the steps you just followed for another problem.

Now let's imagine that Megan relives this episode in another classroom. After the same introductory remarks, Megan is asked the identical question:

Teacher: Now Megan, explain to me what it means when it says on a label that the proportion of vitamin C for one 4-ounce glass of orange juice is half the minimum daily requirement.
Megan: I'm not sure.
Teacher: Look, if the number 1 is on the top and the number 2 is on the bottom, it must mean the top is less than the bottom. Right?
Megan: Right.
Teacher: So if the top number represents "what is" and the bottom number "what could be," then "what is" is one-half less than "what could be." And that can only mean the glass contains half of the minimum daily requirement of vitamin C. Got it?
Megan: Yep.

Well, maybe Megan does "get it" and maybe she doesn't. Notice in the first example that by retracing the mental steps for Megan to recall, the teacher hit Megan's zone of maximum response opportunity, because her prior understanding and responses were taken into account in moving the dialogue closer to the intended goal of the lesson. By differentiating the questioning from that which might be given to another learner with



Diversity among self-directed learners can be activated by teacher interaction and the gentle interplay that taps the learner's zone of maximum response opportunity and provides appropriate stepping stones to higher levels of learning.

a different zone of maximum response opportunity, the teacher provided a peg with which Megan lifted herself to the next rung of the learning ladder.

The second teacher simply provided the right answer. Doing so gave Megan no opportunity to construct her own response by using the mental steps provided and thereby derive a process to use for independently arriving at other right answers in similar circumstances. The first teacher focused on developing for the learner a process of reasoning—a line of thinking—that gave the content its own individual meaning yet was consistent with the intended goal of the lesson.

Through classroom dialogues such as these, you can encourage your learners to construct their own meanings and interpretations—for example, to substitute their own unique constructions for what is and what could be—and to share them with others through discussion and classroom dialogue. Such diversity among self-directed learners activates their unique learning histories, specialized abilities, and personal experiences, thus engaging them in the learning process.

Hitting the Zone of Maximum Response Opportunity

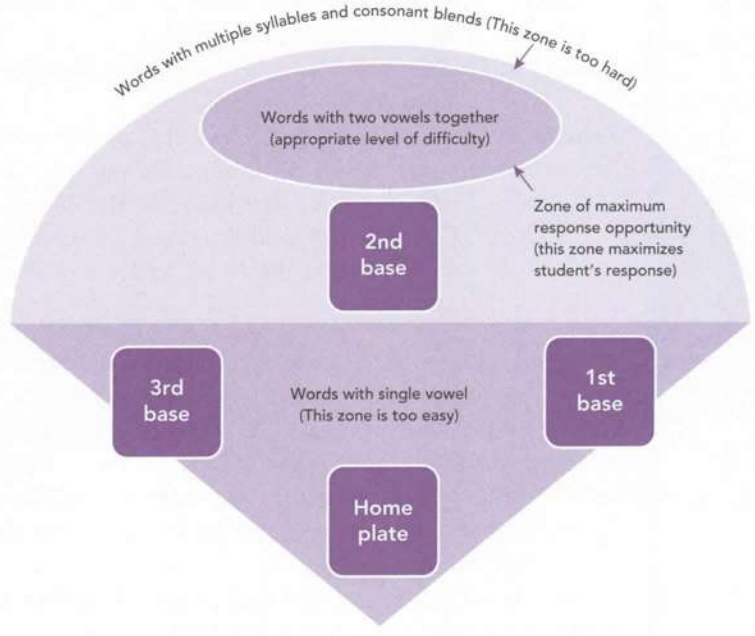
The zone of maximum response opportunity is important in self-directed learning, because you can rarely provide the most appropriate responses to all learners at all times. This is the key difference between *individualized learning* (e.g., in programmed and computerized instruction) and self-directed learning. In *individualized learning,* the content writer anticipates the most probable errors and provides remedial or alternative learning routes (called *branching*) for all learners, regardless of their zones of maximum response opportunity. Because the instruction assumes that relatively homogeneous groups of learners will work through the content, the same types of errors are anticipated for all learners. In some cases, the remedial steps or alternative branching provided may fall within a learner's zone of maximum response opportunity, but in some cases, they may not.

Because self-directed learning frequently occurs during a student response–teacher reaction sequence, it affords the opportunity to more accurately aim your spoken or written reaction at the learner's zone of maximum response opportunity. However, a variety of teacher reactions can fall within the learner's zone of maximum response opportunity with equal effect. After all, your target is not a point but a zone that in some instances may be as broad as the outfield in a major league ballpark. In this broad field, a hit is a hit, whether it falls in left field, center field, or right field, as long as it is within the appointed zone.

This is an important point, because aiming your reaction to a student response too sharply—to a fixed point, like lower center field—may so restrict your response that it will exclude the learning history, specialized abilities, and personal experiences of the learner. In addition, it may not consider your own content knowledge, specialized abilities, and instructional style. Figure 10.1 illustrates the zone of maximum response opportunity for a lesson in reading.

Thus the concept of a zone and the opportunity to target your instruction to fall within it afford both you and your students some latitude within which to construct and create meanings and understandings that consider individuals' unique needs. In this manner,

Figure 10.1 Zone of Maximum Response Opportunity for a Reading Lesson



self-directed learning promotes a gentle interplay between the minds of the learner and teacher, pulling and pushing each other in a student response–teacher reaction sequence designed to help the learner climb to the next rung of the learning ladder.

Functional Errors

Another concept important to self-directed learning is **functional errors.** Student errors play an important role in the interplay between learner and teacher (Stipek, 1996, 2001). If your reaction promotes an inaccurate and meaningless response, the interplay may not be so gentle, at least not in the learner's mind. But if your reaction creates (or even intentionally promotes) a student response that is inaccurate but *meaningful,* the interplay returns to a gentler state.

The latter condition describes a class of student errors called *functional errors.* Whether these errors are unexpected or planned for, they enhance the learner's understanding of content. Functional errors provide a logical stepping stone for climbing to the next rung of the learning ladder, which may eliminate an erroneous thought process from occurring again in the learner's mind. For example, such an error may be necessary so the student will not arrive at the right answer for the wrong reason, thereby compounding the mistake in other contexts.

Consider the following dialogue, in which a student error becomes a functional stepping stone to the next level of understanding:

Teacher: As you recall from yesterday, we were studying the reasons behind the Civil War. Under what president of the United States did the Civil War begin?

Alexis: Our book says Jefferson Davis.

Teacher: Well, it so happens Jefferson Davis was a president at the time. But that's not the right answer. Now how do you think Jefferson Davis could be a president but not the president of the United States at the time of the Civil War?

Alexis: Well, maybe at the start of the war, there were two presidents, Jefferson Davis and someone else.

Teacher: As a matter of fact, there were two presidents, but only one could be president of the United States.

Alexis: Well, if he wasn't president of the United States, he must have been president of the other side.

Teacher: What was the name of the government that represented the other side?

Alexis: Yeah, now I remember. It was the Confederacy. It was Abraham Lincoln who was the president of the North, which must have been called the *United States*, and Jefferson Davis who must have been the president of the South, called the *Confederacy*. I guess I got confused with all the different names.

Even though the student's response was incorrect, this teacher's reaction fell within the student's zone of maximum response opportunity, because from it directly followed a correct response. Notice also how the teacher encouraged the learner to supply the correct answer, using her previous mistake as an aid to obtaining it. This strategy actually led to discussing information that went beyond the question itself—to putting Jefferson Davis in geographic perspective and in correctly naming the governments representing both the North and South.

But what if this teacher had made a less thoughtful reaction, encouraging not only another inaccurate response but worse, a dead end not useful for refining or extending the student's initial response? What might such a reaction look like?

Teacher: Under what president of the United States did the Civil War begin?

Alexis: Our book says Jefferson Davis.

Teacher: I said president of the *United States,* not president of the *Confederate States of America.* See the difference?

Alexis: I guess so.

Teacher: Well, OK. Then let's go on to Mark.

The interplay here becomes considerably less gentle, as the specter of failure is left hanging over the learner and the teacher has no easy way out of this awkward ending. This is why self-directed learning requires teacher responses to be always at or slightly above the learner's current level of understanding and to promote a student response, correct or incorrect, that is functional for achieving the intended goal of the lesson. This is also why scripted approaches to instruction (like programmed instruction and some computer software) cannot replace the gentle interplay between student response and teacher reaction supported by the classroom dialogue and group discussion methods of self-directed learning.

RECIPROCAL TEACHING

One way you can apply self-directed learning in your classroom is with a strategy called *reciprocal teaching* (Brown & Campione, 1994; Lubliner & Palincsar, 2001; Oczkus, 2005; Palincsar & Brown, 1989). **Reciprocal teaching** provides opportunities to explore the content to be learned via classroom dialogue. At the center of reciprocal teaching are group discussions, in which you and your students take turns as leader in discussing the text.

Chuska (2003) and Slavin (1990, 2001) have observed that most classroom discussions amount to little more than recitation of facts by students with the aid of question-and-answer sequences in which all or most of the answers are known. This leaves little opportunity for students to construct their own meaning and content interpretation so they can attain higher levels of understanding. In practice, many classroom discussions pro-

mote little meaningful dialogue that actually helps students struggle with the adequacy of their ideas and opinions on their way to obtaining acceptable solutions. More often, these discussions are driven by text content, with rapid-fire questions that stay close to the facts as presented in the text.

Reciprocal teaching is a strategy that turns a typical discussion into a more productive and self-directed learning experience. It accomplishes this through four activities: predicting, questioning, summarizing, and clarifying. These unfold into the following sequence, described by Oczkus (2005) and Palincsar and Brown (1989):

1. *Predicting.* Discussion begins by generating predictions about the content to be learned from the text based on the following:
   a. Its title or subheading in the text
   b. The group's prior knowledge or information pertaining to the topic
   c. Experience with similar kinds of information

Following the group's predictions about what they expect to learn from the text, the group reads and/or listens to a portion of it.

2. *Questioning.* The teacher chooses one individual to lead a discussion of each portion of the text that is read. Afterward the discussion leader asks questions about the information. Students respond to the questions and raise additional questions.
3. *Summarizing.* The discussion leader then summarizes the text, and the teacher invites other students to comment or elaborate on the summary.
4. *Clarifying.* If any points in the text were unclear (e.g., concepts or vocabulary), they are discussed until clarity is achieved. In this case, students may make more predictions and reread portions of the text for greater clarity.

The following dialogue (based on Palincsar & Brown, 1989) illustrates the four activities of predicting, questioning, summarizing, and clarifying that comprise reciprocal teaching:

Teacher: [Reading from the text.] "The pipefish change their color and movements to blend with their surroundings. For example, pipefish that live among green plants change their color to a shade of green to match the plants."
Claire: [Leading the discussion.] One question that I had about this paragraph is, What is special about the way the pipefish looks?
Teacher: [Clarifying.] Do you mean the way that it is green?
Andy: [Elaborating.] It's not just that it's green. It's that it's the same color as the plants around it, all around it.
Claire: [Continuing.] Yes, that's it. My summary of this part tells how the pipefish looks and that it looks like what is around it. My prediction is that this is about its enemies and how it protects itself and who the enemies are.
Monty: [Adding to the summary.] They also talked about how the pipefish moves . . .
Keith: [Rejoining.] It sways back and forth . . .
Andy: [Adding.] . . . along with the other plants.
Teacher: [Questioning.] What do we call it when something looks like and acts like something else? The way we saw the insect called a *walking stick* yesterday? We clarified this word when we talked about the walking stick.
Angel: Mimic.
Teacher: That's right. We said we would say that the pipefish mimics the . . .
Students: [Together.] . . . plants.
Teacher: OK! Let's see if Claire's predictions come true. [The class turns to the text.]

Notice in this discussion how the teacher supports student participation in the dialogue. The teacher's aim is to engage as many students as possible in the learning process by

providing reactions to student responses that are in their zones of maximum response opportunity. This is accomplished by elaborating on student responses and allowing ample opportunity for students to participate in the dialogue, from their own perspectives (Mayer & Wittrock, 1996). This gives the teacher ample data on which to form a reaction that is within the students' zone of maximum response opportunity.

As the discussion continues, more responsibility for reading and developing the dialogue is given to the students until over time, the teacher becomes more of an adviser or coach, who refines responses instead of providing them. At that point, more and more of the discussion represents the internalization of the text by the students, who now express it through their unique learning histories, specialized abilities, and experiences.

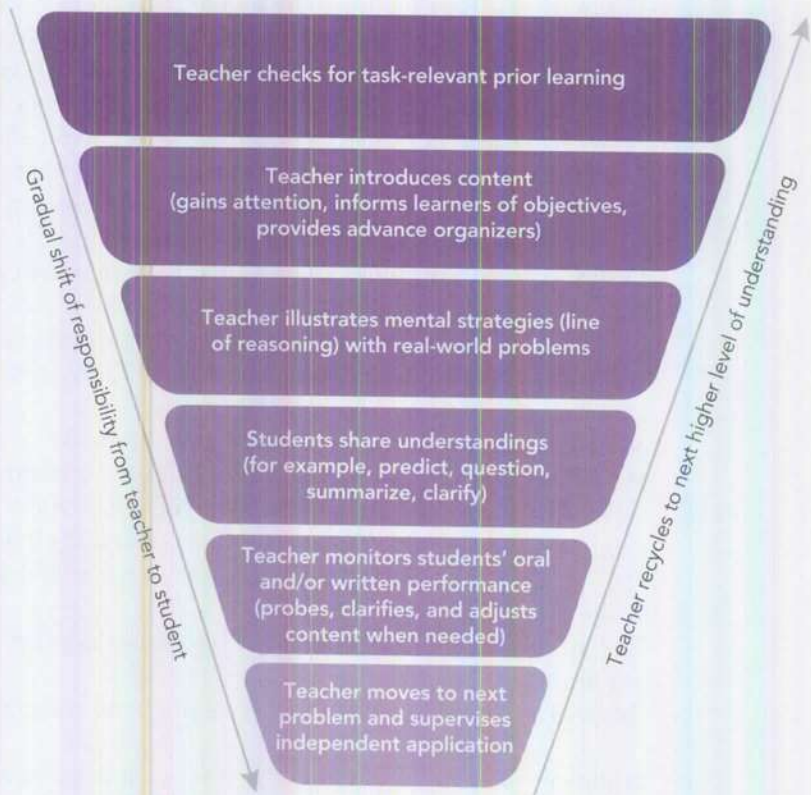
The ultimate goal of reciprocal teaching is to sufficiently engage students in the learning process so they become conscious of their reasoning process. This occurs through their own and other students' modeling, as well as the teacher's modeling of that process, and is refined in the context of classroom dialogue. Doing so requires your continuous attention to the ongoing dialogue and to the meanings students are deriving from the text, so you can continually adjust the instructional content to meet learners' current level of understanding.

As students gradually accept the shift in responsibility from teacher to student, you reduce the amount of explaining, explicitness of cues, and prompting that may have marked the earlier part of the lesson. Figure 10.2 identifies some classroom activities that can guide the gradual shift of responsibility from teacher to learner during self-directed learning.

Oczkus (2005) and Palincsar and Brown (1989) offer this summary of the teacher's role during reciprocal teaching.

- The teacher and students share responsibility for acquiring the strategies employed in reciprocal teaching.

Figure 10.2 Shifting Responsibility from Teacher to Learners



- The teacher initially assumes major responsibility for teaching these strategies ("thinks aloud" how to make a prediction, how to ask a question, how to summarize, how to clarify) but gradually transfers responsibility to the students for demonstrating use of the strategies.
- The teacher expects all students to participate in the discussion and gives all of them the opportunity to lead it. The teacher encourages participation by supporting students through prompting, providing additional information, or raising/lowering the demand on students so learners will achieve meaningful responses.
- Throughout each self-directed lesson, the teacher consciously monitors how successfully comprehension is occurring and adjusts the content as needed to the zone of maximum response opportunity.

Social Dialogue Versus Class Discussion

As the preceding dialogues demonstrated, classroom conversations between the teacher and students are central to self-directed learning. The verbal interactions within a classroom are vastly different from those that occur outside it. In many classrooms, verbalizations are adult dominated, leaving students with little alternative but to respond to teacher requests for facts and information. These traditional teaching settings may offer few opportunities for students to elaborate or comment on the topic at hand.

Outward verbalizations by the learner, if properly scaffolded, can be turned into inner speech that eventually replaces the teacher's prompts and self-guides the learner through similar problems.

However, self-directed learning strategies use classroom dialogue differently. Instead of being a verbalization intended to confirm the teacher's authority, classroom dialogue is purposefully guided to gradually shift responsibility to the learner. The teacher scaffolds knowledge, building the dialogue layer by layer and each time increasing the challenge to the learner to think independently of earlier constructions provided by the teacher.

Scaffolding must be done carefully to keep the challenge within the learner's zone of maximum response opportunity. This requires that you be aware of the learner's present level of understanding (for example, familiarity with the task) and the level at which he or she can reasonably be expected to perform (for example, from past learning performance). Attention to these details lets you scaffold the cognitive demands placed on the learner. You do so to increasingly shift the learner from just *responding* to textual material to *internalizing* its meaning by elaborating, extending, and commenting on it.

As we have seen, the strategy of reciprocal teaching uses group discussion and rotating discussion leaders to achieve this goal. It does so not just by getting students to talk, as do many traditional discussions, but by getting them to elaborate on the processes by which they are learning the content. The clear articulation and rehearsal of these mental strategies (1) guides the learner in subsequent performances and (2) helps you adjust the flow and level of prompts, cues, and questions to hit inside the learner's zone of maximum response opportunity.

The Role of Inner Speech

As we have seen, an important aspect of classroom dialogue in self-directed learning is the increasing responsibility it places on the learner for creating original responses in the form of comments, elaborations, and extensions to what is being read or being

said. These verbalizations, if properly scaffolded, are believed to create an inner speech within the learner (Kozulin, 1990; Resnick & Klopfer, 1989; Simmons, 1995; Vygotsky, 1962). This **inner speech** ultimately leads to a private internal dialogue in the mind of the learner that takes the place of the teacher's prompts and questions and self-guides the learner through similar problems.

As the responsibility for unique and original productions beyond the text gradually shifts to the learner, he or she increasingly acquires the ability to speak internally, modeling the same line of reasoning and mimicking the same types of questions, prompts, and cues used by the teacher at an earlier stage. In other words, the verbal interactions that the teacher increasingly asks of the learner become internalized in the form of private speech used by the learner in the absence of direct teacher involvement.

The teacher's role now turns to one of monitoring. The teacher prompts and cues only when necessary to keep students on track. Ultimately, by internalizing the scaffolded verbalizations of the teacher and recalling them at will in private dialogue, students become their own teachers, mimicking the logic and reasoning process modeled by the teacher. Self-direction can be stimulated by many different techniques in addition to reciprocal teaching, including many forms of cooperative and group learning.

The role of inner speech in guiding the behavior of both children and adults is central to self-directed learning strategies.

SAMPLE DIALOGUES OF SELF-DIRECTED LEARNING

Let's look at three classroom dialogues that exhibit characteristics of self-directed inquiry. In different teaching contexts, these dialogues illustrate the following:

- How a teacher models the process by which meaning and understanding can be derived from textual material
- How questions, prompts, and cues can be used to scaffold responses, gradually shifting the responsibility for learning to the student
- How the teacher thereafter can monitor student responses for continued understanding

First, we will look at a fourth-grade classroom in which Ms. Koker is teaching reading. We will observe how she models the process by which meaning and understanding can be derived from text. Our discussion begins with Ms. Koker reading an excerpt from a short story to the class from the daily reader:

Ms. Koker: [Reading from the text.] "One of the coldest climates on Earth occurs in the northern part of Alaska. In this land, a small but hardy group of Native Americans lives and prospers in small villages where hunting and fishing is a way of life. This small group of villagers . . ."

Debbie: [Interrupting.] Ms. Koker, I don't know what the word *hardy* means.

Ms. Koker: What do you think it means, Debbie? [Asking her to make a prediction.]

Debbie: Well, something that's hard—like maybe ice.

Ms. Koker: Let's see if you are right. Let's think of some other words that might mean almost the same thing as *hard.* [Introducing the idea of synonyms.]

Tim: Something that's hard is strong.

Mickey: Yeah, and it also lasts a long time.

Kim Lee: If you're strong, you can't be hurt.

Ms. Koker: OK, now let's see if any of these ideas fit with the sentence "In this land, a small but hardy group of Native Americans lives and prospers in small villages where hunting and fishing is a way of life." What do you think,

Tim? [Encouraging the idea of fitting synonyms into the text to clarify meaning.]

Tim: Well, if we took out the word *hardy* and put in the word *strong,* I think it would mean the same thing.

Ms. Koker: What do you think, Itsuko?

Itsuko: It makes sense, because when you're strong you can't be hurt—say, by all the cold up north—and then you will live a long time. [Summarizing.]

Mickey: But how do we know they live a long time, just because they are strong? [Asking for clarification.]

Ms. Koker: That's a good point. We really don't know that yet, so what do you think? [Calling for a prediction again.]

Tina: I think they won't live as long as us because of all the cold weather.

Ms. Koker: So how do you think they stay warm? Let's read on to see.

Notice that Ms. Koker was modeling a strategy for deriving meaning from text. To accomplish this, she introduced the idea of synonyms; she asked Debbie what the word *hardy* meant and then asked students to insert the synonym into the text to check its appropriateness. Thus Ms. Koker was conveying a model—a mental strategy—that students can use time and again, unaided by the teacher, whenever they encounter an unknown word.

Next let's observe Mr. Willis's junior high science class to see how he uses questions, prompts, and cues to encourage self-direction. In the following discussion, Mr. Willis is teaching a fundamental law of physics by providing questions and reactions that are scaffolded to his learners' zones of maximum response opportunity:

Mr. Willis: Here you see a balloon, a punching bag, and a tire pump. Watch carefully as I let the air out of the balloon [lets air out], punch the bag [punches it], and press down on the pump handle [pushes handle]. What did you notice about all three actions? Chet?

Chet: You got tired. [Class laughs.]

Mr. Willis: You're right about that, especially when I did the punching and pumping. [Reaching to Chet's current level of understanding.] Yes, you saw a reaction in me: I got tired. What other reactions did you see?

Chet: The balloon flitted across the room.

Mr. Willis And what else?

Chet: The punching bag moved forward—and, well, the pump handle went down and then a little up.

Mr. Willis: You saw several reactions, didn't you? What were they?

Chet: Something happened to the object you were playing with and . . . well . . . I guess something else was going on, too.

Mr. Willis: Anita, what did you see in all three cases?

Anita: Movement in two directions, I think.

Mr. Willis: What were the movements?

Anita: Well, for the balloon, it went forward, but it also pushed the air backward . . . over your face. And for the punching bag, it went forward . . . *umph* [mimics the sound] . . . and stopped. I don't know what other movement there was.

Mr. Willis: [Pushing to the next higher level of understanding.] Think about what happened both after and before I punched the bag. To help you, make two columns on a piece of paper and label them with the words *Before* and *After.* Now write down what you saw in each of these three instances—the balloon, the punching bag, and the pump. Let's all take a minute to do this.

Anita: [After about a minute.] Now I remember. The punching bag came back to hit your hand again. That was the second movement.

Mr. Willis: [Checking for understanding among the others.] And what about the tire pump? Michael, you have your hand up.

Michael: When you pushed the pump handle down to inflate the tire, it came back up.

Mr. Willis: You're both right. There were two identifiable movements, which we will call an *action* and a *reaction.* The fundamental law of physics we have been discussing is that "Whenever there is an action, there must be a reaction." Now let's check to see if this is true for some other movements by identifying on your paper the action and reaction associated with the following. I'll say them slowly so you have time to write:

The space shuttle taking off from Cape Canaveral
An automobile moving down the street
A gunshot
A football being kicked over a goalpost

Notice how Mr. Willis used questions targeted to his students' current level of understanding. This allowed students to respond in some meaningful way, which gave Mr. Willis the opportunity to build on an earlier incomplete response to reach the next higher level of understanding. For example, Mr. Willis used Chet's first crude response, aided by the prompt "What other reactions did you see?" to introduce the concept of an action followed by a reaction. Each time the questioning turned to a new student, Mr. Willis targeted his question, prompt, or cue higher but still within that learner's zone of maximum response opportunity.

Also by thinking through the solution on paper—called *think sheets*—students were actively engaged in working through their responses. At the same time, this approach provided a strategy from which students might more easily derive actions and reactions for the new problems presented at the end of the dialogue. Mr. Willis's use of questions, prompts, and cues at various levels of difficulty kept this class moving through the lesson with increasingly more sophisticated responses.

Now let's look in on a third classroom. Mrs. LeFluir is teaching Spanish to a high school class not just by altering the level of questioning, as did Mr. Willis, but by altering the tasks from which learners experience the application of content firsthand. Without realizing it, Mrs. LeFluir's class is experiencing the difference between *declarative knowledge*—facts, concepts, rules, and geneneralizations intended for oral or written regurgitation—and *procedural knowledge*—action sequences or procedures used in a problem-solving or decision-making task.

Mrs. LeFluir: Today, we will study the gender of nouns. In Spanish, all nouns are either masculine or feminine. Nouns ending in *o* are generally masculine, and those ending in *a* are generally feminine. Tisha, can you identify each of the following nouns as either masculine or feminine? [Writes these words on the board.]

libro
pluma
cuaderno
gramática

Tisha: [Correctly identifies each.]

Mrs. LeFluir: Now let's see how you identified each of the words and what each word means.

Tisha: Well, I followed the rule that if it ends in an *o,* it is masculine, but if it ends in an *a,* it is feminine. I think the words are *book, pen, notebook,* and *grammar.*

Mrs. LeFluir: Good. Now for the next step, you have all used the indefinite articles *a* and *an* many times in your speaking and writing. In Spanish, the word *un* is

used for *a* or *an* before a masculine noun, and *una* is used for *a* or *an* before a feminine noun. In Spanish, the article is repeated before each noun. Using the vocabulary words on the board, let's place the correct form of the indefinite article in front of each word. [Shifting the task demand.] Why don't you take the first one, Ted?

Ted: It would be *un libro.*

Mrs. LeFluir: Maria.

Maria: *Una pluma.*

Mrs. LeFluir: Juan and Marcos, take the next two.

Juan: *Un cuaderno.*

Marcos: *Una gramática.*

Mrs. LeFluir: OK. Now we are ready to put our knowledge to work. I will give you a sentence in English, and you translate it into Spanish, being sure to include the correct form of the indefinite article. [Shifting the task demand again.] For this, you will need to remember your vocabulary from last week. If you need to, look up the words you don't remember. Mark, let's start with you. Come up to the board and write, "Do you want a book?"

Mark: [Writes on board.] *¿Desea usted un libro?*

Mrs. LeFluir: Good. And how did you decide to use *un* instead of *una?*

Mark: The noun ended in *o.*

Mrs. LeFluir: [Continues with three other examples.]

Do you need grammar?
Do you want to study a language?
Do you need a notebook?

[After the students respond, she shifts the task demand again by moving to the following activity.] Now read each sentence on the transparency, and write down the correct form of the indefinite article that goes before the noun. [Shows transparency.]

Yo necesito _____ *gramática.*
Nosotros estudiamos _____ *lengua.*
¿Necesita Tomás _____ *libro?*
¿Es _____ *pluma?*

[After the students respond, she moves to a final activity and yet another task demand.] Now for each of the following sentences, I will speak in English, and I want you to repeat the same sentence entirely in Spanish. Be sure once again to include the correct form of the indefinite article.

Notice in this episode the different activities required of the students and how they differ in cognitive complexity. Mrs. LeFluir gradually changed the demands on her learners by shifting the tasks to which they were to respond. Her lesson began by asking only for the simple restatement of the rules (declarative knowledge) but ended by engaging students in an oral sequence of actions of the kind that might be required in having a conversation in Spanish (procedural knowledge). She gradually shifted her tasks from declarative to procedural in small enough degrees to ensure that all her students (or at least most of them) could follow.

This process also conveyed a language-learning model that will be helpful in subsequent contexts by providing a learning strategy that flows from memorization of rules and vocabulary, through completion and fill-in, to oral delivery. Notice that this sequence was completed even for this elementary lesson. This tells the learners that oral and written delivery—not the repetition of rules—is the goal to which all previous learning must contribute and toward which they must strive in their own individual learning and practice.

The systematic varying of task demands within a unit comprises an **activity structure.** Activity structures are most effective for self-directed learning when they vary the demands or problems being placed on the learner in ways that gradually require him or her to assume responsibility for learning the content at a higher level of understanding. When needed, activity structures can be differentiated for individual or small groups of learners by giving some learners additional declarative exercises representing fewer cognitive demands while others move more quickly from declarative to procedural exercises that represent a greater range of cognitive demands. The following section describes the steps in teaching self-directed inquiry to individual learners.

Steps in Teaching Self-Directed Inquiry to Individual Learners

1. Provide a learning task, and observe how the student approaches it (e.g., reading a short selection in a history text that will be the basis for a writing assignment).
2. Ask the student to explain how he or she approaches the task of learning the textual information in preparation for the writing assignment. (This helps the student analyze his or her own cognitive approach.)
3. Describe and model for the learner a more effective procedure for organizing what he or she reads. For example, explain and demonstrate how to use the study questions at the end of the selection to help focus reading; highlight the main ideas in each paragraph of the selection with a fluorescent marker; and write outline notes of key points on a separate sheet or on note cards as a study guide for later review. This gives the student new strategies for cognitively organizing the writing assignment to come.
4. Provide the student with another similar task (e.g., another reading assignment) for practicing the new cognitive strategies. Model self-questioning behavior as you demonstrate the analysis of this similar problem—for example, "What are the key questions you will need to answer?" and "What is the main idea in this paragraph?" Write the questions on a small card for the student to use as a reminder.
5. Provide another opportunity for the student to practice the skills using self-direction, this time decreasing your role as monitor.
6. Check the result of the learner's comprehension and cognitive organization, giving reminders and corrective feedback.

OTHER COGNITIVE STRATEGIES

When you use a mental strategy to help you learn on your own, you have learned what psychologists call a **cognitive learning strategy,** or a general method of thinking that improves learning across a variety of subject areas. Cognitive learning strategies accomplish this by helping the learner to retain incoming information *(reception),* recall task-relevant prior knowledge *(availability),* and build logical connections among incoming knowledge *(activation).* These strategies (Blanton, 2005; Borich & Tombari, 1997; Goetz, Alexander, & Ash, 1992) include the following:

- Mnemonics (memory aids)
- Elaboration/organization (note taking)
- Comprehension-monitoring strategies
- Problem-solving strategies
- Project-based strategies

Let's take a look at each of these.

Mnemonics

Early cognitive psychologists, such as Ausubel (1968) and Bruner (1996), advocated that teachers organize their lessons around a limited set of powerful ideas called *key understandings* and *principles* (Brophy, 1992). Nevertheless, they recognized that all learners have to learn facts, as well, in order to grasp key understandings and principles. Some cognitive strategies for helping to learn facts, dates, rules, classifications, and so on are discussed in the following sections.

Jingles or Trigger Sentences. *Jingles* or *trigger sentences* can cue sequential letters, patterns, or special historical dates. For example, most music students learn some variation of the statement "Every Good Boy Does Fine" to recall the musical notes EGBDF on the lines of a music treble staff. "Spring forward, fall back" helps us remember which way to adjust the clock at the spring and autumn time changes. And many schoolchildren learn that "In fourteen hundred and ninety-two, Columbus sailed the ocean blue." Such devices also can be used for recalling the steps of a mental strategy.

Narrative Chaining. *Narrative chaining* is the process of weaving a list of key words you wish to remember into a brief story. For example, if you need to memorize the stages of the life cycle of a butterfly in sequence—including the key stages of egg, larva, pupa, and adult—you could invent a narrative such as the following:

> This morning, I cooked an *egg* for breakfast, but I heated it so long that it looked like molten *lava* from a volcano. A *pupil* from a nearby school stopped by, and when he saw my egg-turned-lava, he yelled, "I'm just a pupil! You're the *adult*! Can't you cook an egg better than that?"

In this case, the words *lava* and *pupil* sound enough like *larva* and *pupa* to trigger memory of the correct words in the life cycle sequence.

Number Rhyme or Peg Word. A *number rhyme* or *peg word* uses words that rhyme with a sequence of numbers as a basis for developing imaginative mental pictures that assist in memorizing a set of other less related words. Using the life cycle of the butterfly as an example again, you might employ the number-rhyme system this way:

- *One–Sun:* Imagine a big, fried egg hanging in the sky overhead in place of a brightly shining sun.
- *Two–Stew:* Imagine a bubbling stew erupting from a gigantic volcano under the fried egg, drying to form molten lava.
- *Three–Sea:* Imagine a tiny screaming pupil afloat on a swirling, angry sea where the hot lava sizzles as it meets the seawater.
- *Four–Door:* Imagine a golden door in the side of the volcano that is opened by a gentle, helpful adult who reaches out to pull the pupil from the sea near the lava that was heated by the egglike sun.

Chunking. *Chunking,* or grouping bits of information into sets of five to seven discrete pieces, also can assist in memorization. If the data are also chunked into logical categories, the information is then doubly processed in a mental framework for improved recall. A common example is memorizing a grocery list by splitting it into logical categories (dairy products, vegetables, beverages, etc.) of several items each.

Teaching students to employ such mental organizers gives them creative alternatives by which to manipulate ideas and information and retain mental strategies, thus internally reinforcing their own learning.

Elaboration/Organization (Note Taking)

Elaboration involves teaching learners how to build internal connections between new knowledge and existing knowledge. *Organization* entails showing learners how to order and systematize new information so they can remember it and use it efficiently.

The most practical way to help your learners elaborate and organize new knowledge is to teach them how to take notes (Goetz et al., 1992; Turkel & Peterson, 2003). Note taking can improve information processing in several ways. It enhances reception by prompting learners to attend better to what they are hearing or seeing. Furthermore, note taking assists activation by helping learners make internal connections among information and building a network of external connections with information in memory. You can give your learners several suggestions to help them take notes successfully:

- Read the text before the lesson. This provides advance organizers for the new information.
- Watch for signals that indicate important information (e.g., gestures, key words, cues to the organization of the information).
- Write down main ideas, not isolated facts. Try to be selective and not write down everything.
- When needed, use a more free-form outline format, called *webbing* (Buzan, 2002), using pictures, arrows, and code letters. See Figure 10.3 for an example of webbing.
- Write down examples and questions as you listen.
- Leave blanks or some other prompts to indicate what you missed.
- Review your notes as soon as possible.

Comprehension Monitoring

Comprehension monitoring is a strategy in which students learn to evaluate their own understanding by frequently checking their own progress during the course of a lesson (Gagné et al., 1997; Rozakis & Cain, 2002). A. L. Brown (1994) used this strategy based on the reciprocal teaching method described earlier for helping both poor and good readers. Teachers modeled for learners the following three skills:

1. Survey the text and make predictions about what it says.
2. Ask questions about the main idea of the text as it is being read.
3. Become aware of unclear passages by monitoring one's own understanding, asking "Do I understand what I just read?"

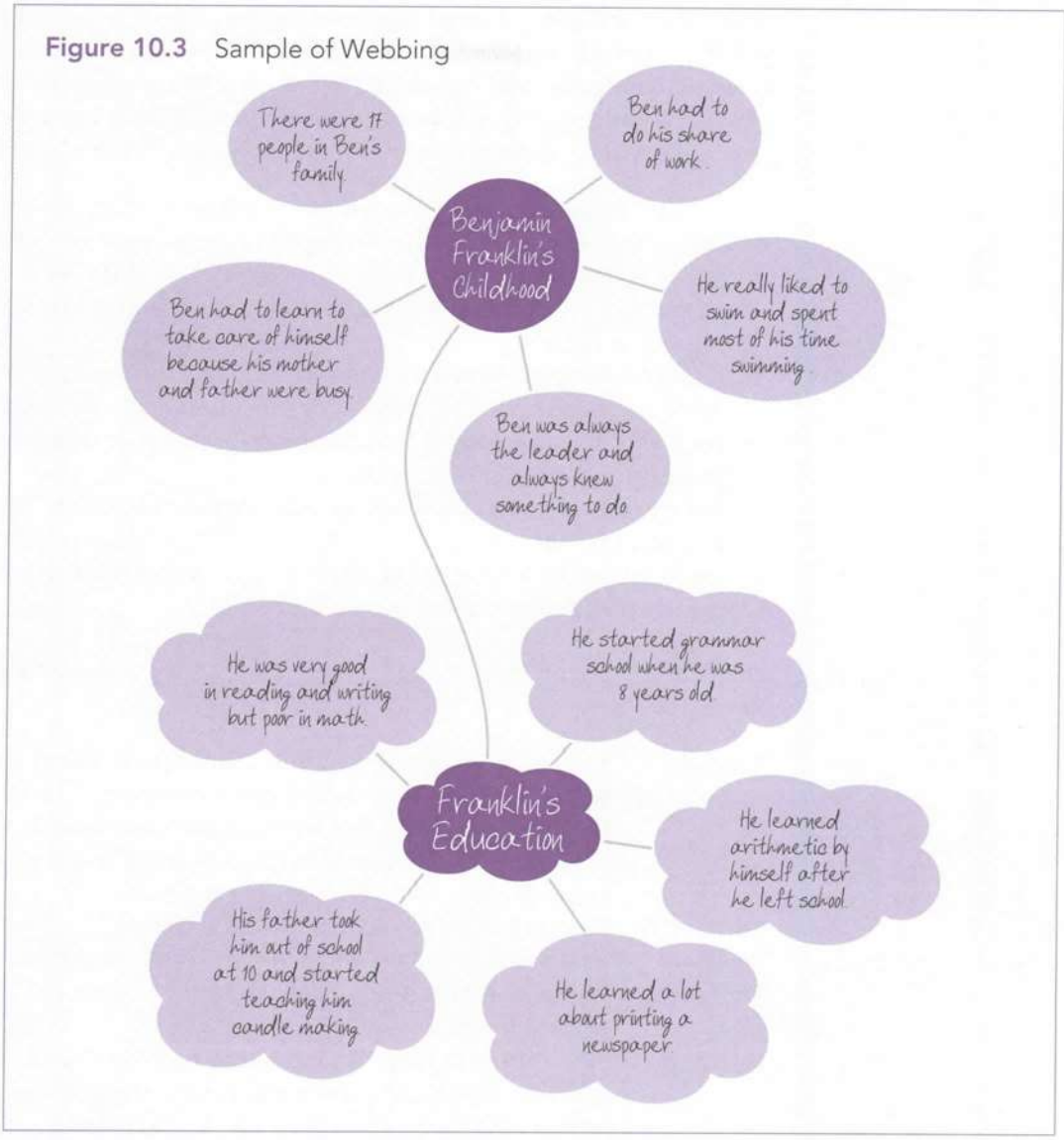
Learners who used this strategy increased their reading comprehension from 50% to 80% after only 4 weeks of instruction. Comprehension-monitoring strategies have in common the following skills:

- *Setting goals:* "What do I have to do?" "Why am I doing this?"
- *Focusing attention:* "What am I supposed to read?" "What activity must I complete?"
- *Self-reinforcement:* "Great, I understand this. Keep up the good work." "This strategy really works."
- *Coping with problems:* "I don't really understand this. I should go back and read it again." "That's a simple mistake. I can fix that."

Problem-Solving Strategies

Cognitive learning strategists recommend that the school curriculum in most subject areas be organized around real-life problems that learners work on for days or weeks (Posamentier & Krulik, 2008; Viadero, 2003). According to some strategists, curricula today are isolated by disciplines (algebra, biology, geography, etc.) that identify lists of topics, facts,

Figure 10.3 Sample of Webbing



Source: Reprinted from *Learning and study strategies: Issues in assessment, instruction, and education*, C. F. Weinstein, E. T. Goetz, and P. A. Alexander (Eds.), D. F. Dansareau, *Cooperative learning strategies*, pp. 103–120, Copyright 1988, with permission from Elsevier.

and skills to be covered by the end of a semester. Such curricula typically place learners in a relatively passive role and encourage rote or other forms of unmeaningful learning.

As an alternative to this approach, growing numbers of educators advocate **problem-based learning** (Barell, 2006; Delisle, 1997; Verduin, 1996). Problem-based learning organizes the curriculum around loosely structured problems (Goetz et al., 1992) that learners solve by using knowledge and skills from several disciplines. Recall that we introduced this general approach in Chapter 4 under the topic of interdisciplinary thematic units and in Chapter 8 under the topic of indirect instruction. In both instances, we emphasized its importance as a teaching strategy. In this chapter, we highlight its importance as a cognitive learning strategy.

To benefit from problem-based learning, however, learners must know how to problem solve. Because problem solving is a cognitive learning strategy in which few learners receive systematic instruction, teachers increasingly will be called on to teach this skill.

There are many systems for solving problems that you may teach to learners (Engel, 1998; Lambros, 2004; McGrath, 2007). These methods are generalizable to all curriculum

areas and to a variety of problems, whether they are well-defined problems (e.g., the word problems typically seen in math curricula) or ill-defined problems with no single answer, with many solution paths, and for which the nature of the problem shifts as learners work on it.

One popular problem-solving system, called IDEAL, involves five stages for teaching problem solving (Bransford & Steen, 1994; Nunn & Kimberly, 2000):

1. ***Identify the problem.*** Learners must first know what the problem or problems are before they can solve them. During this stage of problem solving, learners ask themselves if they understand what the problem is and if they have stated it clearly.
2. ***Define terms.*** Learners check that they understand what each word in the problem statement means.
3. ***Explore strategies.*** Learners compile relevant information and try out strategies to solve the problem. This can involve options such as drawing diagrams, working backward to solve a math or reading comprehension problem, or breaking a complex problem into manageable units.
4. ***Act on the strategy.*** Once learners have explored a variety of strategies, they now select and use one.
5. ***Look at the effects.*** During this final stage, learners ask themselves whether they have come up with an acceptable solution.

The following sample dialogue shows how a fifth-grade teacher taught her learners to use IDEAL:

Teacher: Today we are going to think a little more about the greenhouse problem. Remember what we talked about yesterday. The PTA is giving us money to build a greenhouse, but we have a problem about how we can get the flowers and vegetable plants to grow inside a house when they are supposed to grow outside.

Student 1: First the letter *I*. You *identify* the problem.

Teacher: And what do we do when we identify a problem?

Student 2: We read about the problem and try to figure out what we are supposed to answer or solve.

Teacher: OK. I'll try to identify one of the problems with the greenhouse and then ask one of you to do the same. One of the problems I see is how the plants will get the food they will need. Anybody else?

Student 3: I see a problem: What about when it gets cold?

Teacher: So what's the problem?

Student 3: Well, it's how do you make sure they have the right temperature to live?

Teacher: Good! What was another thing we talked about when you think about problems?

Student 4: Letter *D?* You *define* any words you don't understand in the problem.

Teacher: Why is this important?

Student 4: Well, you want to make sure you really understand the problem. Sometimes we use words and think we know what they mean, but we really don't. So *D* reminds us to make sure we really know what we mean when we say something.

Teacher: Good. I'll give you an example, and then you give me one. What is a *greenhouse?* Are we all agreed on this?

Student 5: And *right temperature.* What does that mean?

Teacher: Great. Now what's the third thing we do when we think about solving a problem? . . .

Teachers who incorporate cognitive strategies into their lessons have two broad goals: to enhance learners' (1) acquisition of knowledge (declarative, procedural, metacognitive) and (2) use of cognitive processes (reception, availability, activation). Teachers increase

the likelihood of achieving these two goals when they teach cognitive learning strategies (mnemonics, elaboration/organization, comprehension monitoring, and problem solving) to their students.

Project-Based Learning

Blumenfeld et al. (1991) and others (Diffily & Sassman, 2002; Harada, Kirio, & Yamamoto, 2008) propose that teachers who build their instruction around projects provide learners with an environment ideally suited for self-directed inquiry. But teachers must do this in ways that assure learners that their success depends on factors they control. **Project-based learning** (1) communicates to learners the importance of the learning process and not just the product, (2) helps them set goals, and (3) uses instructional groupings to elicit the cooperation of others in completing the project.

Like problem-based learning, project-based learning makes extensive use of theories of intrinsic motivation to maintain high levels of student engagement and enthusiasm (Affini, 1996). However, unlike problem-based learning, project-based learning is targeted toward an achievable end product that is visualized before the process is begun.

First let's examine project-based learning and see how it promotes self-directed inquiry through intrinsic motivation. Then we will look at how it guides the inquiry process and the end product.

The Role of Tasks in Project-Based Learning

Project-based learning assigns a critical role in the development of intrinsic motivation to the nature of the classroom learning task. It asks the question, What kinds of tasks are most likely to induce and support learner interest, effort, and persistence?

Project-based learning advocates the use of projects as the most appropriate vehicles for engaging learners, because they can be structured around student interests. Projects have two essential components: (1) They are built around a central question that serves to organize and energize classroom activities, and (2) they require a product or outcome to answer the question successfully. Project-based learning is different from problem-based learning, however, in that it requires the development of a tangible outcome to determine if the end product has been achieved (e.g., a model, poster, demonstration, video, reenactment, or physical construction, such as a science exhibit or collaborative school greenhouse or garden), which because of its complexity often involves the participation of others. Both project- and problem-based learning share the same basic inquiry skills of exploration, discovery, and questioning.

Projects may be built around issues of current societal concern or questions of more historical or intellectual interest. Good projects have these critical characteristics:

- They are of extended duration, requiring several weeks to complete.
- They link several disciplines (e.g., involve math, reading, writing skills).
- They focus on the process as well as the product.
- They involve the teacher as a coach and often require small-group collaboration.

Projects should also (1) present a real-world, authentic challenge; (2) allow for some learner choice and control; (3) be doable, or capable of being carried out within the time and resource limitations of the student and classroom; (4) require some level of collaboration; and (5) produce a tangible product. Let's look more closely at each of these characteristics.

Present a Challenge. A project meets this important criterion when it offers learners an authentic, sometimes novel, and always challenging question to investigate, resolve,

and report on. This is in contrast to doing worksheets, exercise books, end-of-chapter questions, and other routine tasks, which may take up most of learners' academic time.

Allow for Learner Choice and Control. An effective project allows learners options regarding modes of investigation (reading, interviewing, observing, controlled experimentation), styles of reporting (written reports, audiotapes or videotapes, visual displays), solutions to problems, and types of products or artifacts to develop.

Be Doable. Learners will persevere and expend high amounts of effort if they see results. Similarly, they are more likely to believe they can see a project through to a successful conclusion if it is time limited, requires readily available resources, and includes points along the way where they can receive positive feedback, make revisions, and generate further products.

Require Collaboration. Intrinsic motivation is nurtured in classrooms that allow learners to meet their social needs. This theory points out how learners acquire beliefs about their own capabilities from observing others. A project that cannot be completed unless a small group of learners adopt different but essential roles is an ideal vehicle for incorporating the principles of motivational theories.

Result in a Concrete Product. A project that gives learners concrete goals to work toward is more likely to sustain intrinsic motivation. Moreover, the product and the process involved in producing it allows for performance-based assessment (Borich & Tombari, 2004; Tombari & Borich, 1999). This type of assessment allows learners to see the connection between what they do in class and what they have produced. This provides a greater sense of control over their grade, and it better meets their needs for autonomy than a grade based on a paper and pencil test alone.

The Role of the Learner in Project-Based Learning

Educators have urged school reforms that engage learners in hands-on learning activities as the best way to develop self-directed learning (Harada, Kirio, & Yamamoto, 2008; Viadero, 2003). Project-based learning recognizes that learners will acquire important knowledge and skills from a project only if they (1) attribute their success to effort, (2) believe they can accomplish the goals of the project, and (3) perceive themselves as competent. Project-based learning also recognizes that learners are more likely to perceive themselves as competent if they have the prior knowledge, prerequisite skills, and learning strategies necessary for completing the project before they begin.

The Role of the Teacher in Project-Based Learning

Students who fail to see the purpose or personal relevance of class activities perform more poorly than those who do see the connection between their classwork and their lives. Helping learners take ownership of their learning and allowing them some voice in class activities, as well as their evaluation, is often suggested as an important part of increasing motivation and thus decreasing apathy. This appears to hold true across cultural and linguistic lines, as well as across academic disciplines (Anderman & Midgley, 1998; Boss, Krauss, & Conery, 2008; Ngeow, 1998).

Project-based learning recognizes that the teacher is the last piece in the intrinsic motivational puzzle. The teacher's unique role in project-based learning is that of a supporter of the learner's or group's chosen product. Consequently, proponents of project-based learning urge teachers to support their learners' interest, effort, and achievement in these ways:

- Avoid statements that imply that innate ability is all that is required to complete a project.

- Focus learners' attention both on the process of completing the project and on the product that results.
- Make encouraging statements to learners that promote commitment.

See In Practice: Focus on Project-Based Learning.

IN PRACTICE

FOCUS ON PROJECT-BASED LEARNING

Teachers who practice project-based learning, or build their instructional programs around projects, provide learners with an environment ideally suited to the nurturing of motivation (Blumenfeld et al., 1991; Diffily & Sassman, 2002; Harada, Kirio, & Yamamoto, 2008). Cognitive psychologists have proposed three distinct yet overlapping theories of academic motivation: attribution theory, self-efficacy theory, and goal theory. Whether your perspective on motivation aligns with one of these theories or all three, project-based learning offers some solutions to the age-old problem of how to give energy and direction to the classroom behavior of learners.

Attribution Theory

Each of us has succeeded at some endeavors and failed at others. Think about one of your more recent successes or failures. Were you successful or unsuccessful because of the amount of effort that you exerted, your natural ability, luck, or some combination of these? Another way to ask this question is, Do you attribute your success to internal forces, such as effort and ability, or to external forces, such as luck and the difficulty of the task?

Forsterling (2001) and Weiner (1986), leading proponents of attribution theory, believe that people naturally seek to understand why they succeed or fail. Students, for example, when asked to explain why they received a certain grade, typically refer to their hard work or effort, innate ability, the test being easy or hard, or luck. These causes originate either within the learner (effort, ability) or outside the learner (luck, task). A cause originating within the learner is said to have an *internal locus of causality;* one originating outside the learner has an *external locus of causality.*

Motivational theorists such as Weiner (1986) assert that only when learners attribute their success to effort are they likely to exert genuine effort to complete a project or study for a test. If learners attribute their success or failure to ability, luck, or task difficulty—all of which are out of their control—they believe that nothing they can do will improve the situation. Thus how a student thinks about or interprets success or failure, and not the experience of the outcome itself, determines the energy and direction of his or her efforts.

Self-Efficacy Theory

Self-efficacy theory holds that academic motivation hinges on the learner's beliefs that he or she can succeed at school tasks. Bandura (1986), the originator of self-efficacy theory, and Eisenberger (2005) have defined *self-efficacy* as an individual's judgment of his or her capability to organize and execute the courses of actions required to attain desired outcomes. In other words, students are more likely to begin, persist at, and master tasks that they think they are good at. This judgment is what is meant by the term *self-efficacy.*

Judgments about self-efficacy differ from attributions. *Attributions* are perceived causes of success or failure. They influence expectations and behavior, as they are one type of information that learners use when making judgments about self-efficacy. If a learner believes that success in calculus is due to being born with mathematical ability and feels that he or she possesses little of such ability, he or she will have low self-efficacy for calculus.

Bandura (1986) has identified several other sources of information that learners use to make judgments about self-efficacy. One is verbal persuasion, through which the teacher expresses faith and confidence to

(continued)

learners that they can be successful. Another is seeing peers succeed at a particular task. If a learner sees someone whom he or she likes and admires receive high marks or praise from a teacher for solving a difficult geometry theorem, the learner is more likely to believe that he or she can do likewise.

But the most important piece of information used by learners when making self-efficacy judgments is past experiences of success or failure with a particular task. The learner who has received high marks for three previous essays will have higher self-efficacy for the next writing project than the learner who consistently earns low grades. Thus a student weighs a variety of information in addition to attributions when coming to a judgment of self-efficacy for a particular subject. Once made, the judgment directly affects the learner's level of effort and persistence, as well as the level of achievement obtained.

Goal Theory

Goal theory, the third perspective on motivation, focuses on the learner's academic goal orientation as a source of motivation. Dweck and Reppucci's (1973) work with fifth-grade math students showed that uncontrollable failure created in learners' minds a disposition of helplessness that caused them to make no effort to solve easy problems, to which they had already given correct answers. In the late 1970s, Diener and Dweck (1980) began to investigate whether the goals for learning set by children had a more or less pronounced effect on the development of so-called learned helplessness. They administered psychological tests to groups of children to determine their academic goal orientation and found that children generally fall into two goal groups with regard to interest in learning. One group, called the *task-focused group*, focused on developing academic competence and improving their skills for purely intrinsic reasons. The other group, called the *ability-focused group*, engaged in learning tasks with the goal of "showing off their ability, outperforming others, and gaining external rewards like praise and good grades." This study showed that the two categories of goals are distinct and result in dramatically different degrees of academic motivation.

Much of the research on goal theory has shown that, in comparison to ability-focused learners, students who adopt task-focused or mastery goals are more likely to achieve in school, make more use of cognitive strategies when problem solving, and expend substantial mental effort searching their memories and relating new learning to prior learning. Researchers have documented that as children proceed through the elementary school grades, they increasingly believe that their ability sets a limit on what they can learn (Ames, 1990; Gordon & Gordon, 2006). And certain classroom activities, such as ability grouping, exacerbate this viewpoint. Thus goal theory places special emphasis on classroom practices that can enhance a student's personal goal beliefs. These goal beliefs can affect a broad range of motivational behaviors, including persistence, use of learning strategies, choices, and preferences.

CULTURALLY RESPONSIVE SELF-DIRECTED LEARNING

The work of Delgado-Gaitan (2006), Gay (2000), Grant and Ray (2009), Obiakor (2006), and Weinstein et al., (2005) has underscored two important dimensions of the teacher's role in modifying classroom dialogue in the culturally diverse classroom that have become relevant to self-directed instruction. One of these is that of teacher mediation—the on-the-spot adjustments made by the teacher to extend or refocus a student's response to move him or her to the next rung on the learning ladder. The second dimension is mental modeling—the active demonstration of strategies by which students can better learn and retain the content taught.

These results have been applied in the culturally diverse classroom through various forms of social interaction to encourage students to construct their own meanings and interpretations and to revise and extend them under the guidance of the teacher. As we have seen, among the strategies for promoting teacher mediation are reciprocal teaching (Lubliner & Palincsar, 2001; Rosenshine & Meister, 1994) and problem- and project-based

learning (Baden & Mayor, 2004; Blumenfeld et al., 1991). With each of these strategies, the teacher can elicit an individual student's responses at his or her current level of understanding based on personal experiences with and predictions about the content to be taught.

Other strategies that can help promote culturally responsive self-directed instruction include the following:

1. *Pose challenging problems.* Focus the problem so the learner must make key decisions about what is important for a solution. This feeling of responsibility and control over the inquiry is important if the learner is to become engaged and see learning as truly self-directed.
2. *Choose learning activities that allow freedom of choice and include interests.* By letting students pursue and investigate some topics of their own—choosing and constructing their own meanings and interpretations—you will be making them participants in the design of their own learning.
3. *Plan instruction around group activities during self-directed instruction.* Participating in group activities is when learners are most capable of picking up ideas from others and creating from them new and unusual variations that can be applied during self-directed learning.
4. *Include real-life problems that require problem solving.* Let learners become actual investigators in solving real-world dilemmas. Doing so will force them to place newly acquired knowledge and understanding in a practical perspective and to increase the problem-solving challenge.
5. *When testing, draw out knowledge and understanding using content that is compatible with students' culture and thus familiar to them.* Use assessments that make students go beyond knowing and remembering facts by asking them to explain, analyze, compare, contrast, hypothesize, infer, adopt, and justify as a means of indicating they can construct in their own words the meaning of what you are teaching.

With these self-directed approaches to learning, you will be able to support the participation of all your learners in the dialogue of the classroom. Your aim should be to engage as many students as possible in the learning process by providing reactions to student responses that are in their zones of maximum response opportunity. This can be accomplished in several ways:

1. Differentiating your instruction by adjusting the flow and complexity of the content to meet individual learners' needs
2. Offering ample opportunity for all students to participate in the dialogue from their own perspectives (Stipek, 2003)
3. Providing cognitive strategies with which students can better learn and remember the content taught

Finally, ask yourself these questions to check on the success of your efforts:

- Has my instruction been focused within my learners' zones of maximum response opportunity? Are learners bored because they have already mastered these skills, or are they frustrated because the skills are beyond what they can be expected to learn?
- Has my instruction been too solitary? Have I met my learners' social learning needs by allowing for sufficient conversation, public reasoning, shared problem solving, and cooperative projects that reproduce the cultures in which they spend the most time?
- Have I been expecting learners to acquire knowledge that is incompatible with their cultures? Do I use instructional methods that are culturally unfamiliar, irrelevant, or contradictory?

Go to Topic 10: "Inquiry Models" in the MyEducationLab for your course, where you can apply and practice your understanding of the core teaching skills identified in the chapter with a Building Teaching Skills and Dispositions learning unit.

Case History and Licensure Preparation

DIRECTIONS: The following case history pertains to Chapter 10 content. After reading the case history, go to Chapter 10 in the Book Specific Resources section in the MyEducationLab for your course. Open the Case History and Licensure Preparation activity and complete the questions that follow. Upon completion of the test, scored answers to the short-answer question and multiple-choice questions will be provided.

CASE HISTORY

Mrs. Henson's culturally diverse fifth-grade class has just read a section in their science books about discoveries that challenged long-held ideas. Two of these long-held ideas were the notions of a flat Earth and an Earth-centered planetary system. The following is an excerpt from the follow-up discussion:

Mrs. Henson: Why the big smile, Nate? Was there something in our chapter that tickled your funny bone?

Nate: Well, it's just pretty weird—thinking of all those tough sailors, making it through storms without a blink but worrying all the time that they might slip off the edge of the world. I mean, that's pretty dumb, don't you think?

Mrs. Henson: I don't know. Almost everyone else at the time thought so, too. Did you ever think that centuries from now, some other "Nate" will be sitting in another classroom, laughing at us for believing in an idea that everyone else thinks is wrong?

Nate: I never thought of it that way. You mean, even though we know so much today, we might still have some things completely wrong?

Mrs. Henson: Let's think about that, class, and make some predictions. How about discussing this topic with the others at your table for a few minutes. What will students be laughing about in classrooms a couple of centuries from now? What beliefs that everyone accepts as truth today do you think will be proved false, and why?

[Mrs. Henson walks around the room as students discuss the possibilities among themselves. She pauses briefly at several tables, sometimes just to listen and sometimes to give encouragement, such as "I never would have thought of that" and "I think you're right on with that one." When she is sure that each table has at least one good suggestion, she reconvenes the full-class discussion.]

Mrs. Henson: Loretta, your group had a very interesting idea. Want to share it with us?

Loretta: Well, you know how everyone is telling us to wash our hands before we eat and to use this or that detergent or cleaner because it kills germs? Well, we predict that people in the future will know that germs are really good for us.

Mrs. Henson: But what I found most interesting as I listened to your group's conversation was the reasoning behind your prediction. Can you explain a little about that, Freeman?

Freeman: It's back to the future, I guess. My grandma, she grew up in the country, and her daddy used to say, when her mama fussed at the little ones for putting everything in their mouths, "You got to eat a bushel of dirt in your life, Addie, so don't be too hard on the little ones." According to my grandma, she and her sisters didn't have near the number of colds that we do now.

Sylvester: My uncle always says the same thing, too. "A few germs is good for you," he says.

Tiffany: I don't agree. Maybe the reason your relatives didn't get as sick was 'cause they lived in the country and they didn't come in contact with as many sick people as we do in the cities now.

Mrs. Henson: So you think the "Germs are good for you" theory fails to consider other changes, or *variables* as scientists call them?

Sylvester: No way! My uncle lived in the city, in a small apartment with six brothers and sisters.

Mrs. Henson: Besides the wisdom of your elders, what other explanations or reasons do you have for this idea?

Loretta: I guess we figured that it was something like too much of a good thing. Without any germs, we're not used to them—kind of like an only child who never has to share toys. When we meet up with germs after hardly ever having had them before, we're like my cousin when she has to share. She freaks out, and so do our bodies.

Freeman: And we really had some cool ideas about other things we could do with germs. We domesticated horses. Why not germs? Germs are so small and multiply so rapidly, we could get them to deliver some good things to our bodies—kind of like luggage that just comes along with us. Maybe things that would clear our arteries or protect us from cancer?

Mrs. Henson: I'm really impressed with your group. Not only did you come up with a prediction and an explanation for it, but you also took it to the next level and created further uses for your idea. Very good work. Now Carmen, tell us what your group chose.

Carmen: Old age. It doesn't have to happen.

Mrs. Henson: Now you have my undivided attention. [Class laughs.]

SUMMING UP

The main points in this chapter include the following:

Self-Directed Learning

1. *Self-directed learning* is an approach to teaching and learning that actively engages students in the learning process for the purpose of acquiring outcomes at higher levels of cognitive complexity.
2. Self-directed learning involves the following sequence of activities:
   - Provide information about when and how to use mental strategies for learning.
   - Illustrate how to use the strategies in the context of real-world problems.
   - Encourage students to restructure the content in terms of their own ways of thinking and prior understandings.
   - Gradually shift the responsibility for learning to students through practice activities (exercises, dialogues, discussions) that engage them in increasingly complex patterns of thought.

Metacognition

3. *Metacognition* is a strategy for self-directed learning that assists learners in internalizing, understanding, and recalling the content to be learned.
4. Metacognitive strategies include self-interrogation, self-checking, self-monitoring, and analyzing, along with techniques for classifying and recalling content called *mnemonics.*
5. Metacognitive strategies are taught through *mental modeling,* in which learners are walked through the process of attaining a correct solution. Mental modeling includes these stages:
   - Showing students the reasoning involved
   - Making students conscious of the reasoning
   - Focusing students on the application of the reasoning
6. *Teacher mediation* is the teacher's on-the-spot adjustment of content flow and complexity to accommodate students' individual learning needs.

7. The role of the teacher in teacher-mediated learning is to adjust the instructional dialogue to help learners restructure their learning according to their unique abilities, learning histories, and personal experiences.
8. The *zone of maximum response opportunity* represents the level of content difficulty and behavioral complexity from which the learner can most benefit at the moment a response is given.
9. The zone of maximum response opportunity is reached through a classroom dialogue in which the teacher provides reactions to student responses that activate the unique learning history, specialized ability, and personal experience of each learner. Based on these unique characteristics, the learner can acquire individual meanings and interpretations of the content.

Functional Errors

10. *Functional errors* are incorrect or partially correct answers given by the learner that can enhance the meaning and understanding of the content and provide a logical stepping stone to the next level of learning.

Reciprocal Teaching

11. *Reciprocal teaching* involves a type of classroom dialogue in which the teacher expects students to make predictions, ask questions, summarize, and clarify when learning from text.
12. Reciprocal teaching provides opportunities to explore the content to be learned via group discussion.
13. Reciprocal teaching involves this sequence of activities:
    - Generate predictions about the content to be learned from the text, and read and/or listen to a portion of it.
    - Choose a discussion leader who asks other students questions about the text; then have students respond to the questions and ask questions of their own.
    - Have the discussion leader summarize the text, and then invite other students to comment or elaborate.
    - Clarify any unresolved questions, ask for more predictions, and reread portions of the text for greater clarity, if needed.
14. The teacher's role during reciprocal teaching is to gradually shift the responsibility for learning to the students by reducing the amount of explaining, explicitness of cues, and prompting that may have marked earlier portions of the lesson.
15. During reciprocal teaching, the teacher's role is to do the following:
    - Share the responsibility for learning with the students.
    - Initially, assume responsibility for modeling how to make a prediction, how to ask a question, how to summarize, and how to clarify, but then transfer the responsibility to students for demonstrating use of these strategies.
    - Encourage all students to participate in the classroom dialogue by prompting, providing additional information, and/or altering the response demand on students.
    - Monitor student comprehension and adjust the rate and complexity of information as needed.

Social Dialogue versus Class Discussion

16. In self-directed learning, the teacher scaffolds, or builds the dialogue within a discussion step by step, each time increasing the challenge to the learner to think independently of earlier constructions. Scaffolding must occur to the appropriate degree for each learner response to keep the challenge within the learner's zone of maximum response opportunity.
17. During self-directed learning, inner (private) speech helps the learner elaborate and extend the content in ways unique to him or her. As responsibility for learning beyond the text gradually shifts to the learner, his or her ability for inner speech increases, modeling the same reasoning and using similar questions, prompts, and cues as the teacher did at an earlier stage.

Sample Dialogues of Self-Directed Learning

18. The following are the steps for teaching self-directed learning to individual learners:
    - Provide a new learning task, and observe how the student approaches it.
    - Ask the student to explain how he or she plans to learn the content (e.g., preparing for an exam).
    - Describe and model a more effective procedure for organizing and learning the content (e.g., using study questions, taking notes, or highlighting key features in the text).
    - Provide another similar task with which the student can practice the strategies provided. Model self-questioning behavior during the task to ensure the learner follows the strategies correctly (e.g., "Did I underline the key words?").
    - Provide other opportunities for the student to practice, decreasing your role as a monitor.

- Check the result by questioning the student's comprehension and use of the strategies taught.

Other Cognitive Strategies

19. Other cognitive strategies can be helpful for organizing and remembering new material during self-directed learning:
    - Mnemonics
    - Elaboration/organization (note taking)
    - Comprehension monitoring
    - Problem-solving strategies
    - Project-based strategies
20. *Problem-based learning* is a problem-solving approach that organizes the curriculum around loosely structured problems that learners solve by using knowledge and skills from several disciplines.

Project-Based Learning

21. *Project-based learning* is an approach that promotes intrinsic motivation by organizing instruction around the tasks most likely to evoke and support learner interest, effort, and persistence. Key elements include a focus on the learning process (not just the product), goal setting, and instructional grouping.

Culturally Responsive Self-Directed Learning

22. Classroom dialogue can be modified to foster the goals of self-directed learning in a culturally diverse classroom by doing the following:
    - Adjusting the flow and complexity of the content
    - Offering ample opportunity for all students to participate
    - Teaching cognitive strategies

KEY TERMS

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DISCUSSION AND PRACTICE QUESTIONS

Questions marked with an asterisk are answered in Appendix B. Some asterisked questions may require student follow-up responses not included in Appendix B. Go to the Assignments and Activities section of the various topics on the MyEducationLab for your course to complete additional practice activities related to this chapter's content.

*1. Identify two purposes for engaging your students in self-directed learning. In which content areas that you will be teaching will these purposes most apply?
*2. What sequence of activities is involved in self-directed learning?
*3. What is *metacognition?* What can metacognitive strategies accomplish in your classroom?
*4. During a demonstration, what specific outcomes can mental modeling help your students acquire?
*5. What is your role during teacher-mediated learning? How might this role differ from that during a teacher lecture or student recitation?
*6. In your own words, describe the *zone of maximum response opportunity.* Then using the natural language of the classroom, write a short teacher–student dialogue that hits the zone of maximum response opportunity.
*7. Explain the sequence of activities that normally occurs during reciprocal teaching.
*8. What should be your most important goal in promoting classroom dialogue during self-directed learning?

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