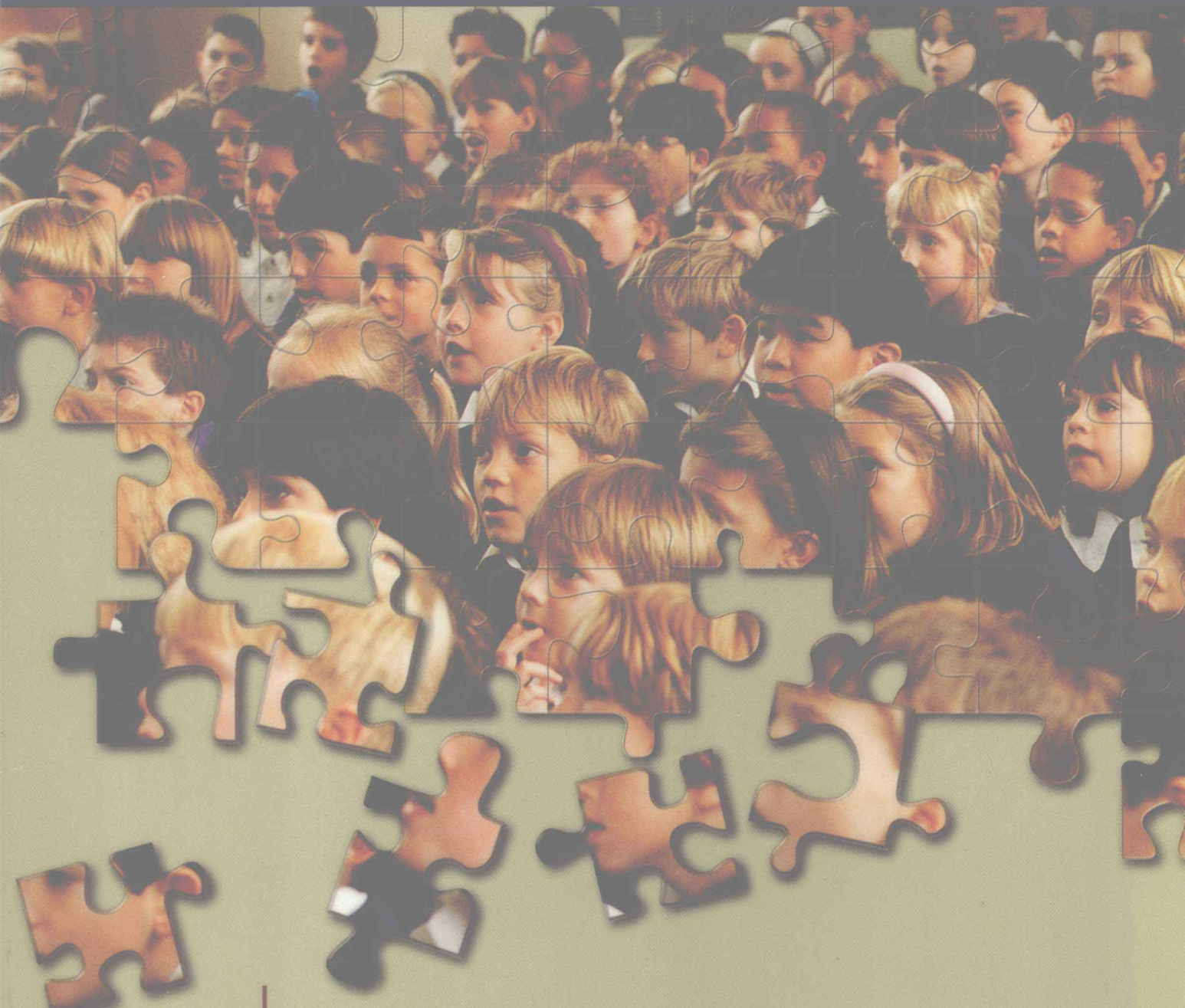


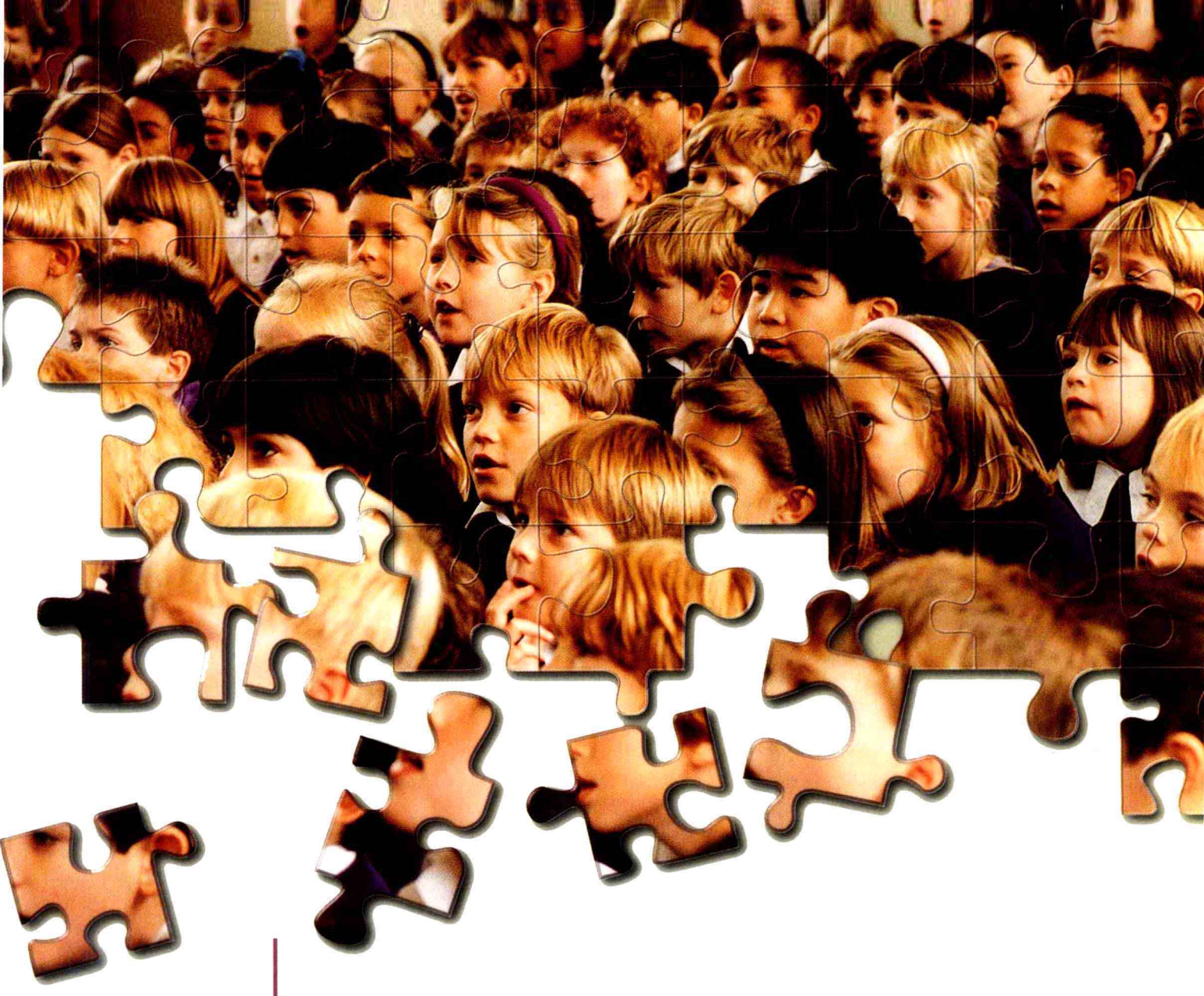
Educational Psychology

Developing Learners

THIRD EDITION

Jeanne Ellis Ormrod

MULTIMEDIA EDITION



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THIRD EDITION

Educational Psychology

Developing Learners

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University of Northern Colorado

University of New Hampshire

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Preface

Soon after I wrote the first edition of *Educational Psychology,* I had the good fortune to return to a middle school classroom teaching geography to two sections of sixth, seventh, and eighth graders. On my first day back in a K-12 setting, I was quickly reminded of how exciting and energizing the process of teaching growing children can be. This experience confirmed once again what I have always known—that the principles of educational psychology have clear relevance to the decisions a classroom teacher must make on an ongoing basis. How children and adolescents learn and think, how they change as they grow and develop, why they do the things they do, how they are often very different from one another—our understanding of all these things has innumerable implications for classroom practice and, ultimately, for the lives of the next generation.

I have been teaching educational psychology since 1974, and I have loved every minute of it. Because I want the field of educational psychology to captivate you the way it has captivated me, I have tried to make the book interesting, meaningful, and thought-provoking as well as informative. I have a definite philosophy about how future teachers can best learn and apply educational psychology—a philosophy that has guided me as I have written all three editions of this book. More specifically, I believe that you can construct a more accurate and useful understanding of the principles of educational psychology when you:

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- Focus on core principles of the discipline
- Relate the principles to your own learning and behavior
- Mentally "process" the principles in an effective manner
- Consider numerous classroom applications of the principles

As I will show you in a moment, I have incorporated numerous features into the book that will encourage you to do all of these things. I hope that you will learn a great deal from what educational psychology has to offer, not only about the students you will be teaching but also about yourself—a human being who continues to learn and develop even now.

Features of the Book

Focusing on Core Principles

Rather than superficially explore every aspect of educational psychology, I have chosen to offer in-depth treatment of the fundamental concepts and principles that have broad applicability to classroom practice. If I myself couldn't imagine how a concept or principle could be of use to a teacher, I left it out. I have highlighted many of the key principles in the *Principles/Assumptions* tables that appear throughout the book.

▲ FOCUSING ON PRINCIPLES

Throughout the text, principles and core concepts are identified, discussed in depth, and then summarized for you in *Principles/Assumptions* tables. Each table includes educational implications and concrete examples.

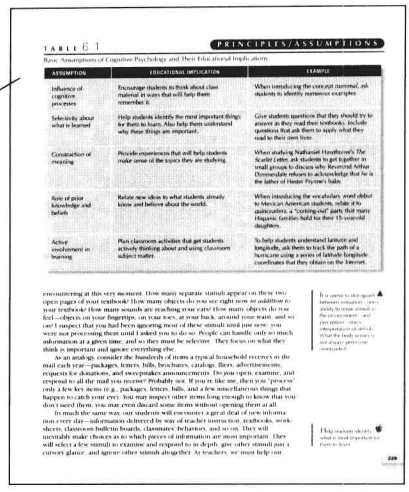


TABLE 6.1 PRINCIPLES/ASSUMPTIONS

Basic Assumptions of Cognitive Psychology and Their Educational Implications

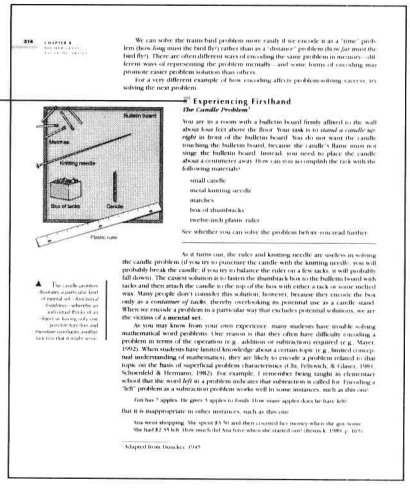
ASSUMPTION	EDUCATIONAL IMPLICATION	EXAMPLE
Influence of cognitive processes	Encourage students to think about class material in ways that will help them remember it.	When introducing the concept chemical, ask students to identify numerous examples
Selectivity about what is learned	Help students identify the most important things for them to learn. Also help them understand why these things are important.	Give students questions that they should try to answer as they read their textbooks. Include questions that ask them to apply what they read to their own lives.
Construction of meaning	Provide experiences that will help students make sense of the topics they are studying.	When studying Nathaniel Hawthorne's *The Scarlet Letter*, ask students to get together in small groups to discuss why Reverend Arthur Dimmesdale refuses to acknowledge that he is the father of Hester Prynne's baby.
Role of prior knowledge and beliefs	Relate new ideas to what students already know and believe about the world.	When introducing the vocabulary word debut to Mexican American students, relate it to quinceañera, a "coming-out" party that many Hispanic families hold for their 15-year-old daughters.
Active involvement in learning	Plan classroom activities that get students actively thinking about and using classroom subject matter.	To help students understand latitude and longitude, ask them to track the path of a hurricane using a series of latitude-longitude coordinates that they obtain on the Internet.

Relating Principles to Your Own Learning and Behavior

A central goal of this text is to help you discover more about yourself as a thinker and learner. If you can understand how you *yourself* learn, you will be in a better position to understand how your students learn and, as a result, to help them learn more effectively. Throughout the book, I've provided many exercises to help you discover important points firsthand and thereby construct a more complete, meaningful understanding of psychological principles of learning, development, motivation, and behavior. Appearing as *Experiencing Firsthand* features, these exercises are in some ways similar to the "hands-on" activities that can help students learn in elementary and secondary classrooms. But because I ask you to use your mind rather than your hands, you might more accurately think of them as "head-on" experiences.

EXPERIENCING FIRSTHAND

Numerous exercises embedded in the text allow you to experience firsthand some of the concepts and principles we examine. The understanding you gain from these experiences will enable you not only to see more vividly how psychology principles operate, but also to use these principles more effectively in your own classroom teaching.



We can solve the trans-bird problem more easily if we encode it as a "time" problem (how *long* must the bird fly) rather than as a "distance" problem (how *far* must the bird fly). There are often different ways of encoding the same problem in memory—different ways of representing the problem mentally—and some forms of encoding may promote easier problem solution than others.

For a very different example of how encoding affects problem-solving success, try solving the next problem.

Experiencing Firsthand
The Candle Problem

You are in a room with a bulletin board firmly affixed to the wall about four feet above the floor. Your task is to *stand a candle* upright in front of the bulletin board. You do not want the candle touching the bulletin board, because the candle's flame must not singe the bulletin board. Instead, you need to place the candle about a centimeter away. How can you accomplish the task with the following materials?

small candle
metal knitting needle
matches
box of thumbtacks
twelve-inch plastic ruler

See whether you can solve the problem before you read further.

▲ The candle problem illustrates a particular kind of mental set—functional fixedness—whereby an individual thinks of an object as having only one possible function and therefore overlooks another function that it might serve.

As it turns out, the ruler and knitting needle are useless in solving the candle problem (if you try to puncture the candle with the knitting needle, you will probably break the candle; if you try to balance the ruler on a few tacks, it will probably fall down). The easiest solution is to fasten the thumbtack box to the bulletin board with tacks and then attach the candle to the top of the box with either a tack or some melted wax. Many people don't consider this solution, however, because they encode the box only as a *container of tacks*, thereby overlooking its potential use as a candle stand. When we encode a problem in a particular way that excludes potential solutions, we are the victims of a **mental set**.

As you may know from your own experience, many students have trouble solving mathematical word problems. One reason is that they often have difficulty encoding a problem in terms of the operation (e.g., addition or subtraction) required (e.g., Mayer, 1992). When students have limited knowledge about a certain topic (e.g., limited conceptual understanding of mathematics), they are likely to encode a problem related to that topic on the basis of superficial problem characteristics (Chi, Feltovich, & Glaser, 1981; Schoenfeld & Hermann, 1982). For example, I remember being taught in elementary school that the word *left* in a problem indicates that subtraction is called for. Encoding a "left" problem as a subtraction problem works well in some instances, such as this one:

Jim has 7 apples. He gives 4 apples to Josh. How many apples does he have left?

But it is inappropriate in other instances, such as this one:

Ana went shopping. She spent $5.50 and then counted her money when she got home. She had $2.35 left. How much did Ana have when she started out? (Resnick, 1989, p. 167)

Adapted from Duncker, 1945

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"Processing" Principles Effectively

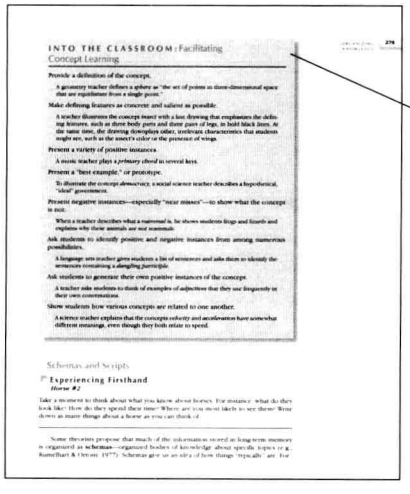
Research tells us that many students, including many at the college level, use relatively ineffective strategies for reading, studying, and learning. But research also tells us that students *can acquire* effective strategies and that when they begin to use such strategies, they find themselves successfully learning and remembering what they read and hear.

One important principle of learning is that people learn and remember new information more effectively when they relate it to what they already know—a process called *meaningful learning*. I will ask you to reflect on your own knowledge and experiences at the beginning of each chapter and in *Thinking About What You Know* features at various other spots throughout the book. In addition, some of the margin notes designated with a ▫ symbol will ask you to consider personal experiences or to recall ideas discussed in previous chapters.

Another effective strategy is *organization*—making connections among the various pieces of information that you're learning; the *Compare/Contrast* tables that appear throughout the book will help you organize some of the key ideas in each chapter. Still another learning strategy is *elaboration*—expanding on information as you study it, drawing inferences, thinking of new examples, making predictions, and so on. Many of the ▫ questions in the margin will encourage you to elaborate on concepts and principles as I describe them. The ▲ notes in the margin can help you with both organization and elaboration: They may show you how you can connect the material you are reading with ideas presented in later chapters, or they may provide additional, "elaborative" information about those ideas.

Taking Principles Into the Classroom

Throughout the text, I consistently apply psychological concepts and principles to classroom practice. Some of these applications are summarized and illustrated in *Into the Classroom* features and *Students in Inclusive Settings* tables; many others are highlighted with a 🍎 in the margin. Furthermore, the ▫ questions will sometimes ask you to consider possible applications in your own specific circumstances as a teacher.


INTO THE CLASSROOM: Facilitating Concept Learning

Provide a definition of the concept.

A geometry teacher defines a sphere as "the set of points in three-dimensional space that are equidistant from a single point."

Make defining features as concrete and salient as possible.

A teacher illustrates the concept insect with a line drawing that emphasizes the defining features, such as three body parts and three pairs of legs, in bold black lines. At the same time, the drawing downplays other, irrelevant characteristics that students might see, such as the insect's color or the presence of wings.

Present a variety of positive instances.

A music teacher plays a *primary chord* in several keys.

Present a "best example," or prototype.

To illustrate the concept *democracy*, a social science teacher describes a hypothetical, "ideal" government.

Present negative instances—especially "near misses"—to show what the concept is not.

When a teacher describes what a *mammal* is, he shows students frogs and lizards and explains why these animals are not mammals.

Ask students to identify positive and negative instances from among numerous possibilities.

A language arts teacher gives students a list of sentences and asks them to identify the sentences containing a dangling participle.

Ask students to generate their own positive instances of the concept.

A teacher asks students to think of examples of adjectives that they use frequently in their own conversations.

Show students how various concepts are related to one another.

A science teacher explains that the concepts *velocity* and *acceleration* have somewhat different meanings, even though they both relate to speed.

Schemas and Scripts

Experiencing Firsthand

Horse #2

Take a moment to think about what you know about horses. For instance, what do they look like? How do they spend their time? Where are you most likely to see them? Write down as many things about a horse as you can think of.

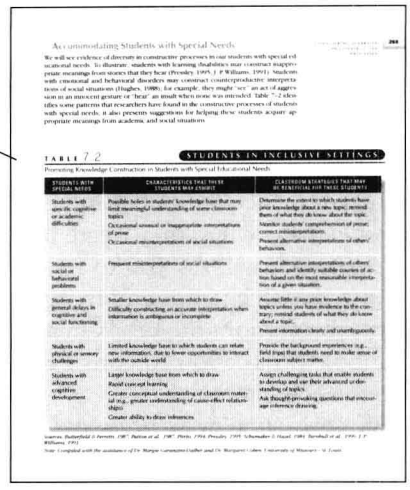
Some theorists propose that much of the information stored as long-term memory is organized as **schemas**—organized bodies of knowledge about specific topics (e.g., Rumelhart & Ortony, 1977). Schemas give us an idea of how things "typically" are. For

INTO THE CLASSROOM 🍎

At least twice in every chapter, teaching strategies are collected and presented together in *Into the Classroom* features. Applying the textbook's content, these features provide practical teaching strategies and concrete examples from a variety of subject areas and grade levels.

DIVERSITY AND INCLUSION

Each chapter contains a section that examines pertinent issues of diversity and exceptionality. In addition, practical and applied teaching strategies are described in tables that can help you work with *Students in Inclusive Settings*.



Accommodating Students with Special Needs

We will see evidence of diversity in constructive processes in our students with special educational needs. To illustrate: students with learning disabilities may construct inappropriate meanings from stories that they hear (Pressley, 1995; J. P. Williams, 1991). Students with emotional and behavioral disorders may construct counterproductive interpretations of social situations (Hughes, 1989); for example, they might "see" an act of aggression in an innocent gesture or "hear" an insult when none was intended. Table 7–2 identifies some patterns that researchers have found in the constructive processes of students with special needs; it also presents suggestions for helping these students acquire appropriate meanings from academic and social situations.

TABLE 7.2 STUDENTS IN INCLUSIVE SETTINGS

Promoting Knowledge Construction in Students with Special Educational Needs

STUDENTS WITH SPECIAL NEEDS	CHARACTERISTICS THAT THESE STUDENTS MAY EXHIBIT	CLASSROOM STRATEGIES THAT MAY BE BENEFICIAL FOR THESE STUDENTS
Students with specific cognitive or academic difficulties	Possible holes in students' knowledge base that may limit meaningful understanding of some classroom topics Occasional unusual or inappropriate interpretations of prose Occasional misinterpretations of social situations	Determine the extent to which students have prior knowledge about a new topic; remind them of what they do know about the topic. Monitor students' comprehension of prose; correct misinterpretations. Present alternative interpretations of others' behaviors.
Students with social or behavioral problems	Frequent misinterpretations of social situations	Present alternative interpretations of others' behaviors and identify suitable courses of action based on the most reasonable interpretation of a given situation.
Students with general delays in cognitive and social functioning	Smaller knowledge base from which to draw Difficulty constructing an accurate interpretation when information is ambiguous or incomplete	Assume little if any prior knowledge about topics unless you have evidence to the contrary; remind students of what they do know about a topic. Present information clearly and unambiguously.
Students with physical or sensory challenges	Limited knowledge base to which students can relate new information, due to fewer opportunities to interact with the outside world	Provide the background experiences (e.g., field trips) that students need to make sense of classroom subject matter.
Students with advanced cognitive development	Larger knowledge base from which to draw Rapid rote or meaningful learning Greater conceptual understanding of classroom material (e.g., greater understanding of cause-effect relationships) Greater ability to draw inferences	Assign challenging tasks that enable students to develop and use their advanced understanding of topics. Ask thought-provoking questions that encourage inference drawing.

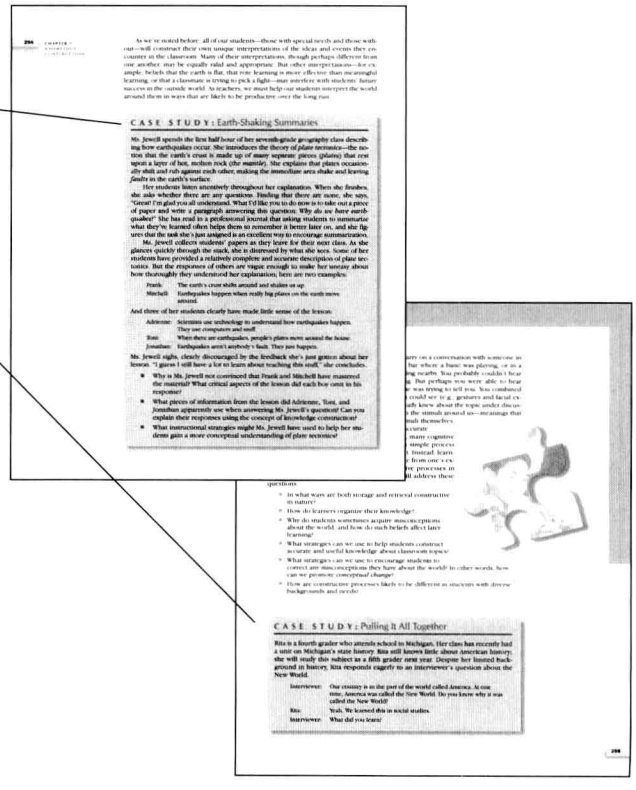
Sources: Butterfield & Ferretti, 1987; Bulgren et al., 1987; Pressley, 1994; Pressley, 1995; Schumaker & Hazel, 1984; Turnbull et al., 1999; J. P. Williams, 1991

Note: Compiled with the assistance of Dr. Margie Cunningham Lasher and Dr. Margaret Cohen, University of Missouri–St. Louis.

In addition, every chapter begins and ends with *case studies.* The case study at the beginning of each chapter presents an example of one or more students dealing with a particular classroom learning task. As we proceed through the chapter, we will continually relate our discussion back to this case, helping you connect chapter content to a classroom context. The case study at the end of each chapter focuses on teachers and teaching; it will help you apply ideas you have encountered in the chapter and make instructional decisions based on what you have learned.

CASE STUDIES

Each chapter opens with a case that is referred to throughout the chapter, helping you tie psychological principles to the authentic context of the classroom. Chapters also end with *case studies* that give you an opportunity to apply what you have learned to teaching decisions.



As we noted before, all of our students—those with special needs and those without—will construct their own unique interpretations of the ideas and events they encounter in the classroom. Many of their interpretations, though perhaps different from one another, may be equally valid and appropriate. But other interpretations—for example, beliefs that the earth is flat, that rote learning is more effective than meaningful learning, or that a classmate is trying to pick a fight—may interfere with students' future success in the outside world. As teachers, we must help our students interpret the world around them in ways that are likely to be productive over the long run.

CASE STUDY: Earth-Shaking Summaries

Ms. Jewell spends the first half hour of her seventh-grade geography class describing how earthquakes occur. She introduces the theory of *plate tectonics*—the notion that the earth's crust is made up of many separate pieces (plates) that rest upon a layer of hot, molten rock (the mantle). She explains that plates occasionally shift and rub against each other, making the immediate area shake and leaving *faults* in the earth's surface.

Her students listen attentively throughout her explanation. When she finishes, she asks whether there are any questions. Finding that there are none, she says, "Great! I'm glad you all understand. What I'd like you to do now is to take out a piece of paper and write a paragraph answering this question: Why do we have earthquakes?" She has read in a professional journal that asking students to summarize what they've learned often helps them to remember it better later on, and she figures that the task she's just assigned is an excellent way to encourage summarization.

Ms. Jewell collects students' papers as they leave for their next class. As she glances quickly through the stack, she is distressed by what she sees. Some of her students have provided a relatively complete and accurate description of plate tectonics. But the responses of others are vague enough to make her unsure about how thoroughly they understood her explanation; here are two examples:

Frank: The earth's crust shifts around and studies us up.
Mitchell: Earthquakes happen when really big places on the earth move around.

And three of her students clearly have made little sense of the lesson:

Adrienne: Scientists use technology to understand how earthquakes happen. They use computers and stuff.
Toni: When there are earthquakes, people's plates move around the house.
Jonathan: Earthquakes aren't anybody's fault. They just happen.

Ms. Jewell sighs, clearly discouraged by the feedback she's just gotten about her lesson. "I guess I still have a lot to learn about teaching this stuff," she concludes.

- Why is Ms. Jewell not convinced that Frank and Mitchell have mastered the material? What critical aspects of the lesson did each box omit in his response?
- What pieces of information from the lesson did Adrienne, Toni, and Jonathan apparently use when answering Ms. Jewell's question? Can you explain their responses using the concept of knowledge construction?
- What instructional strategies might Ms. Jewell have used to help her students gain a more conceptual understanding of plate tectonics?

questions.

- In what ways are both storage and retrieval constructive in nature?
- How do learners organize their knowledge?
- Why do students sometimes acquire misconceptions about the world, and how do such beliefs affect later learning?
- What strategies can we use to help students construct accurate and useful knowledge about classroom topics?
- What strategies can we use to encourage students to correct any misconceptions they have about the world? In other words, how can we promote conceptual change?
- How are constructive processes likely to be different in students with diverse backgrounds and needs?

CASE STUDY: Pulling It All Together

Rita is a fourth-grader who attends school in Michigan. Her class has recently had a unit on Michigan's state history. Rita still knows little about American history; she will study this subject in a fifth grader next year. Despite her limited background in history, Rita responds eagerly to an interviewer's question about the New World.

Interviewer: Our country is in the part of the world called America. At one time, America was called the New World. Do you know why it was called the New World?
Rita: Yeah. We learned this in social studies.
Interviewer: What did you learn?

Changes in the Third Edition

Although most of the content in the second edition remains in the third, I have made several changes to reflect current trends in educational psychology and educational practice. Among the most significant changes to this revision are: the addition of three new chapters, including Learning in the Content Areas, Promoting Learning Through Student Interactions, and Students with Special Educational Needs; new and expanded topics; and a reorganization of Part 3.

New Chapter on "Learning in the Content Areas"

Chapter 9 applies principles of cognitive psychology to learning reading, writing, mathematics, science, and social studies. Four general themes—constructive processes, the influence of prior knowledge, metacognition, and developmental differences—and many content-specific teaching strategies appear throughout the chapter.

New Chapter on "Promoting Learning Through Student Interactions"

Discussion of instructional strategies has been expanded to two chapters, and Chapter 14 is now devoted exclusively to describing interactive approaches to instruction including: communities of learners, class discussions, reciprocal teaching, cooperative learning, and peer tutoring.

New Chapter on "Students with Special Educational Needs"

Chapter 5 describes recent trends in special education and presents numerous strategies for teachers who work in inclusive classrooms. (The "Students in Inclusive Settings" tables that appeared in each chapter of the second edition remain in the third edition as well.)

New and Expanded Topics

The third edition includes new sections on contemporary applications of Vygotsky's ideas; theoretical perspectives on language development; heredity, environment, and group differences in intelligence; how procedural knowledge is learned; critical thinking; setting events; behavioral momentum; positive behavioral support; self-regulated learning; lesson plans; direct instruction; and working effectively with parents. Discussions of other topics have, of course, been updated in keeping with recent developments in theory and research.

Reorganization of Part 3

Topics related to planning for instruction—identifying instructional goals, conducting task analyses, and developing lesson plans—now appear at the beginning of Chapter 13 ("Choosing Instructional Strategies") and pave the way for the discussion of instructional strategies. Chapter 15 is now devoted entirely to the topic of "Creating and Maintaining a Productive Classroom Environment."

Supplementary Materials

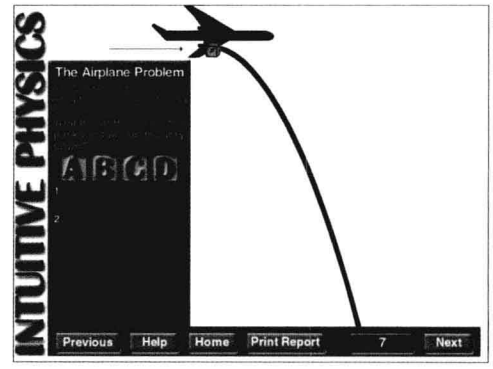
Numerous supplements to the textbook are available to enhance your learning and development as a teacher.

Student Study Guide. The *Student Study Guide* provides many support mechanisms to help you learn and study more effectively. These include focus questions to consider as you read the text, a chapter glossary, application exercises to give you practice in applying concepts and principles of educational psychology to classroom settings, answers to selected margin notes, sample test questions, and several supplementary readings.

***Simulations in Educational Psychology and Research* (Compact Disk).** A compact disk accompanies the third edition of the textbook. This CD contains four activities that resemble actual research studies in educational psychology: "The Pendulum Experiment" (to be used with either Chapter 2 or Chapter 9); "Assessing Moral Reasoning" (to be used with Chapter 3); "Bartlett's Ghosts" (to be used with Chapter 7); and "Intuitive Physics" (to be used with Chapter 7, 8, or 9). As you use the CD, you will find yourself "participating" in the activities in much the same way that students in the original research studies did; the CD will ask you to respond to various situations and then give you feedback about your responses. The CD will also help you connect the activity with educational practice.

SIMULATION EXERCISES

CD-ROM icons in the text margins indicate places where one of the simulation exercises on the CD *Simulations in Educational Psychology and Research* is relevant to chapter content. Through these simulation exercises, you will be able to explore learning experiences related to Piaget's developmental stages, misconceptions and conceptual change, schemas and the construction of meaning, and Kohlberg's stages of moral development.



Companion Website. You can find the Website for *Educational Psychology: Developing Learners* at **www.prenhall.com/ormrod.** For each chapter of the book, the Website presents Key Questions that identify the chapter's central issues, a chapter glossary, key terms linked to Internet destinations, and a quick self-test (multiple-choice and essay questions that let you self-assess what you've learned). The Website also provides Syllabus Manager™, which your instructor may use to post and occasionally update the course syllabus, as well as an interactive "Message Board" through which you and your classmates can engage in discussions about chapter content.

Videotapes* and *MultiMedia Guide. Videos are a highly effective means of visually demonstrating concepts and principles in educational psychology. The eight videotapes that accompany this textbook portray a wide variety of teachers, students, and classrooms in action. Six videos present numerous case studies in many content domains and at a variety of grades levels. Two additional videos are: "A Private Universe" (which examines learner misconceptions in science) and Constance Kamii's "Double-Column Addition: A Teacher Uses Piaget's Theory" (which depicts a constructivist approach to teaching mathematics). Opportunities to react to these videos in class discussions will further enhance your ability to think analytically and identify good teaching practices. Your instructor will have a *MultiMedia Guide* to help guide and enrich your interpretation and understanding of what you see in the videos.

Instructor's Manual. Available to your instructor are suggestions for learning activities, additional "head-on" exercises, supplementary lectures, case study analyses, discussion topics, group activities, and additional media resources. These have been carefully selected to provide opportunities to support, enrich, and expand on what you read in the textbook.

Transparencies. The transparencies that your instructor may use in class will include tables and classroom exercises similar to those found in your textbook. These transparencies are designed to help you understand, organize, and remember the concepts and principles you are studying.

PowerPoint Slides and Supplementary Lectures and Activities. Your instructor may use a CD-ROM that includes PowerPoint versions of the transparencies, supplementary lectures, and activities that appear in the *Instructor's Manual.*

Test Bank. Many instructors use the test questions that accompany this textbook. Some items (lower-level questions) will simply ask you to identify or explain concepts and principles you have learned. But many others (higher-level questions) will ask you to apply those same concepts and principles to specific classroom situations—that is, to actual student behaviors and teaching strategies. The lower-level questions assess your basic knowledge of educational psychology. But ultimately, it is the higher-level questions that will assess your ability to use principles of educational psychology in your own teaching practice.

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J. E. O.

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