



Fotosearch/Glow Images

# 5

## Individual Differences and Special Educational Needs

### Learning Outcomes



- 5.1** Describe various perspectives on the nature of intelligence, and identify several ways in which you can nurture intelligence in your own students.
- 5.2** Explain how students' cognitive styles and dispositions might influence their classroom performance.
- 5.3** Identify implications of the U.S. Individuals with Disabilities Education Act (IDEA) for your own work as a teacher.
- 5.4** Explain how you might adapt your instruction and classroom practices to the unique strengths and limitations of students with various disabilities.
- 5.5** Explain how you might nurture the development of students who show exceptional gifts and talents.

## CASE STUDY: TIM

In elementary school, Tim earned reasonable grades despite poor reading comprehension skills. Although he often appeared to be in a daze during classroom activities, he was generally well behaved. In middle school his grades began to decline, and teachers complained of his spaciness and tendency to daydream. He had trouble staying on task in class and was so disorganized that he seldom completed homework. When Tim reached high school, he seemed unable to cope with the independence his teachers expected of students, and so he failed several 9th- and 10th-grade classes.

Now, as a 17-year-old 11th grader, Tim undergoes an in-depth psychological evaluation at a university diagnostic clinic. An intelligence test yields a score of 96, reflecting average ability, and measures of social and emotional adjustment are also within an average range. However, measures of attention consistently show this to be an area of weakness. Tim explains that he has trouble ignoring distractions and must find a very quiet place to do his schoolwork. Even then, he says, he often has to reread something several times to grasp its meaning. (Based on Hathaway, Dooling-Litfin, & Edwards, 2006, pp. 410–412)

- Tim's attention problems have obviously been interfering with his academic achievement. But if you look closely at the facts presented in the case, you might realize that Tim also has strengths on which teachers can build. What particular characteristics might be working in Tim's favor?
- As a teacher, how might you adapt your instructional strategies and classroom environment to accommodate Tim's unique needs?



The clinic evaluation team eventually concludes that Tim has attention-deficit hyperactivity disorder, or ADHD. (Like Tim, some students identified as having ADHD exhibit attention problems *without* hyperactivity.) The team suspects that a learning disability might be at the root of the problem but doesn't have sufficiently precise diagnostic techniques to determine this with certainty. On the plus side, Tim is certainly motivated to do well in school: He's well behaved in class, seeks out quiet places to study, and may read something several times in an effort to make sense of it. With appropriately modified instruction and settings—for example, teaching Tim basic organizational skills, breaking a single complex task into several shorter and simpler ones, and giving him a quiet place to read and study—Tim can more readily stay on task and complete assignments (Barkley, 2006; Meltzer, 2007).

Teachers have many diverse responsibilities, and meeting the needs of students like Tim may make prospective teachers feel somewhat anxious. As we will see, students show significant **individual differences** in cognitive abilities, personalities, physical skills, and so on. In this chapter we'll look at individual differences in intelligence, cognitive styles, and dispositions. We'll then consider *students with special needs*—students who, like Tim, are different enough from their peers that they require specially adapted curriculum materials, instructional practices, or both. As we go along, we'll find that the most effective instruction tends to be **differentiated instruction**—instruction that is tailored to align with each student's current knowledge, skills, and needs.

## Intelligence

It is common for teachers, parents, and others to be involved in conversations about students' intelligence, and many of us use that term often. However, there are a variety of ways to talk about intelligence. As teachers, we need to be aware that this is a complex

## CHAPTER OUTLINE

### Intelligence

- Theoretical Perspectives of Intelligence
- Measuring Intelligence
- Nature and Nurture in the Development of Intelligence
- Cultural and Ethnic Diversity in Intelligence
- Being Smart About Intelligence and IQ Scores

### Cognitive Styles and Dispositions

- Do Students Have Distinct Learning Styles?
- Does It Make Sense to Teach to Students' "Right Brains" or "Left Brains"?
- Analytic and Holistic Thinking

### Educating Students with Special Needs in General Education Classrooms

- Public Law 94-142: Individuals with Disabilities Education Act (IDEA)
- Potential Benefits and Drawbacks of Inclusion
- Identifying Students' Special Needs: Response to Intervention and People-First Language

### Students with Specific Cognitive or Academic Difficulties

- Learning Disabilities
- Attention-Deficit Hyperactivity Disorder (ADHD)
- Speech and Communication Disorders
- General Recommendations

### Students with Social or Behavioral Problems

- Emotional and Behavioral Disorders
- Autism Spectrum Disorders
- General Recommendations

### Students with General Delays in Cognitive and Social Functioning

- Intellectual Disabilities

### Students with Physical or Sensory Challenges

- Physical and Health Impairments
- Visual Impairments
- Hearing Loss
- General Recommendations

### Students with Advanced Cognitive Development

- Giftedness

### Considering Diversity When Identifying and Addressing Special Needs

### General Recommendations for Working with Students Who Have Special Needs



topic. As we will discuss, measures of intelligence can be very useful, but overinterpretation of these scores can sometimes be harmful to our students. Theorists define and conceptualize *intelligence* in a variety of ways, but most agree that it has several distinctive qualities:

- It is *adaptive*: It can be used flexibly to respond to a variety of situations and problems.
- It is related to *learning ability*: People who are intelligent in particular domains learn new information and skills in those domains more quickly and easily than people who are less intelligent in those domains.
- It involves the *use of prior knowledge* to analyze and understand new situations effectively.
- It involves the complex interaction and coordination of *many different mental processes*.
- It is *culture specific*. What is considered to be intelligent behavior in one culture isn't necessarily intelligent behavior in another culture. (Dai, 2010; Laboratory of Comparative Human Cognition, 1982; J. Li, 2004; Neisser et al., 1996; Saklofske, van de Vijver, Oakland, Mpofu, & Suzuki, 2015; Sternberg, 1997, 2004, 2007; Sternberg & Detterman, 1986)

With these qualities in mind, we offer an intentionally broad definition of **intelligence**: the ability to apply prior knowledge and experiences flexibly to accomplish challenging new tasks.

For most theorists intelligence is somewhat different from what a person has actually learned (e.g., as reflected in school achievement). At the same time, intelligent thinking and behavior *depend* on prior learning. Intelligence, then, isn't necessarily a permanent, unchanging characteristic; it can be modified through experience and learning.

## THEORETICAL PERSPECTIVES OF INTELLIGENCE

Some psychologists have suggested that intelligence is a single, general ability that people have to varying degrees and apply in a wide range of activities. Others have disagreed, citing evidence that people can be more or less intelligent on different kinds of tasks, at different points in development, and in different contexts. The theories of intelligence we examine in this section reflect these diverse perspectives on the nature of intelligence.

### SPEARMAN'S CONCEPT OF *g*

Imagine that you give a large group of students a wide variety of tests—some measuring verbal skills, others measuring visual–spatial thinking, still others measuring mathematical problem solving, and so on. Chances are that the test scores would all correlate with one another to some degree: Students who score high on one test would tend to score high on the other tests as well. The correlations would be strong among tests of very similar abilities; those among tests of distinctly different abilities would be weaker. For example, a student who scored very high on a vocabulary test would probably score high on other measures of verbal ability but might have only modest success in solving math problems (McGrew, Flanagan, Zeith, & Vanderwood, 1997; Neisser et al., 1996; Spearman, 1904).

Charles Spearman (1904, 1927) drew on such findings to propose that intelligence comprises both (1) a single, pervasive reasoning ability (a *general factor*) that is used across the board and (2) a number of more specific abilities, such as problem-solving ability and abstract reasoning (*specific factors*). The general factor and any relevant specific factors work together during the execution of particular tasks.

Many contemporary psychologists believe that sufficient evidence supports Spearman's concept of a general factor in intelligence—often known simply as Spearman's *g*. Underlying it, they suspect, may be a general ability to process information quickly and efficiently (Bornstein et al., 2006; Coyle, Pillow, Snyder, & Kochunov, 2011; Haier, 2003). A general ability to control and direct one's thinking may also be involved (Cornoldi, 2010; H. L. Swanson, 2008).

### CATTELL'S FLUID AND CRYSTALLIZED INTELLIGENCES

Several decades after Spearman's groundbreaking work, Raymond Cattell (1963, 1987) found evidence for two distinctly different components of general intelligence (*g*). First, people differ in **fluid intelligence**, their ability to acquire knowledge quickly, use abstract reasoning abilities, and adapt to new situations effectively. Second, they differ in **crystallized intelligence**, the knowledge and skills they've accumulated from their experiences, schooling, and culture. Fluid intelligence

As we consider the roles of the central executive and metacognition in Chapter 6 and Chapter 7, respectively, we'll look more closely at how people can control and direct their own thought processes.

is more important for new, unfamiliar tasks, especially those that require rapid decision making and involve nonverbal content. Crystallized intelligence is more important for familiar tasks, especially those that depend heavily on language and prior knowledge. Cattell suggested that fluid intelligence is largely the result of inherited biological factors, whereas crystallized intelligence depends on both fluid intelligence and experience and thus is influenced by both heredity and environment.

## EXPERIENCING FIRSTHAND

### CRYSTALLIZED AND FLUID INTELLIGENCE

Consider the following two questions (Roberts & Lipnevich, 2012):

1. What is the next number in this sequence: 1 2 1 4 1 6 1 8?
2. What is the meaning of the word *peripatetic*?

One of these questions assesses fluid intelligence, whereas the other assesses crystallized intelligence. Can you tell which is which? Question 1 assesses fluid intelligence; a student has to reason abstractly to figure out the next number in the sequence; in contrast, question 2 represents crystallized intelligence, because knowledge of the meaning of the word *peripatetic* is something that a student would have learned—the answer could not be determined through any form of reasoning.<sup>1</sup> Both of these types of intelligence are important and valuable, but as you can see, they are also quite different.

### CATTELL–HORN–CARROLL THEORY OF COGNITIVE ABILITIES

Some theorists have built on Cattell's distinction to suggest that intelligence may have three layers, or *strata* (Ackerman & Lohman, 2006; Carroll, 1993, 2003; D. P. Flanagan & Ortiz, 2001; Horn, 2008). In this *Cattell–Horn–Carroll theory of cognitive abilities*, the top stratum is general intelligence, or *g*. Underlying it in the middle stratum are 9 or 10 more specific abilities (including crystallized and fluid intelligence)—processing speed, general reasoning ability, general world knowledge, ability to process visual input, and so on—that encompass fluid and/or crystallized intelligence to varying degrees. And underlying *these* abilities in the bottom stratum are more than 70 very specific abilities, such as reading speed, mechanical knowledge, and number and richness of associations in memory. The Cattell–Horn–Carroll theory is the most researched and most widely accepted theory of intelligence among individuals who work with school-aged children and adolescents, and many of the IQ assessments currently in use are based on this theory (Kyllonen, 2015). The Cattell–Horn–Carroll theory is too complex to describe in detail here, but you should be aware that psychologists are increasingly finding it useful in predicting and understanding students' achievement in various content domains (e.g., J. J. Evans, Floyd, McGrew, & Leforgee, 2001; Phelps, McGrew, Knopik, & Ford, 2005; B. E. Proctor, Floyd, & Shaver, 2005; Proctor, 2012).

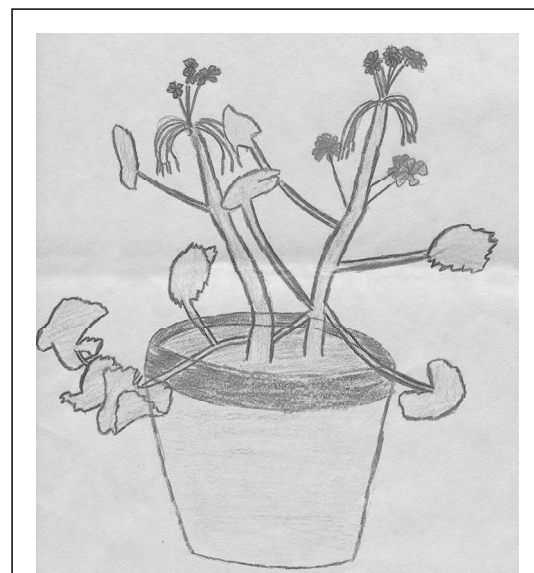
### GARDNER'S MULTIPLE INTELLIGENCES

Howard Gardner (1983, 1999, 2011; Gardner & Hatch, 1990) suggests that people have at least eight distinctly different abilities, or *multiple intelligences*, that are relatively independent of one another (see Table 5.1). In his view there may also be a ninth (existential) intelligence dedicated to philosophical and spiritual issues (e.g., Who are we? Why do we die?). However, because evidence for it is weaker than that for the other intelligences (Gardner, 1999, 2000a, 2003), we have omitted it from the table.

Gardner presents some evidence to support the existence of these distinctly different intelligences. For instance, he describes people who are quite skilled in one area, perhaps in composing music, yet have seemingly average



Keep in mind that different students are likely to be intelligent in different ways.



Attention to detail in 10-year-old Luther's drawing of a plant suggests some talent in what Gardner calls *naturalist* intelligence.

<sup>1</sup>The next numbers in the sequence would be 1 and 10; *peripatetic* means roaming or traveling (when used as an adjective) and a person who roams or travels (when used as a noun).

**TABLE 5.1 • Gardner’s Multiple Intelligences**

TYPE OF INTELLIGENCE	EXAMPLES OF RELEVANT BEHAVIORS
<b>Linguistic intelligence:</b> Ability to use language effectively	<ul style="list-style-type: none"> <li>• Making persuasive arguments</li> <li>• Writing poetry or contributing to a blog</li> <li>• Noticing subtle nuances in meanings of words</li> </ul>
<b>Logical–mathematical intelligence:</b> Ability to reason logically, especially in mathematics and science	<ul style="list-style-type: none"> <li>• Solving mathematical problems quickly</li> <li>• Generating mathematical proofs</li> <li>• Formulating and testing hypotheses about observed phenomena<sup>a</sup></li> </ul>
<b>Spatial intelligence:</b> Ability to notice details of what one sees and to imagine and manipulate visual objects in one’s mind	<ul style="list-style-type: none"> <li>• Creating mental images</li> <li>• Manipulating mental images</li> <li>• Drawing a visual likeness of an object</li> <li>• Seeing subtle differences among visually similar objects</li> </ul>
<b>Musical intelligence:</b> Ability to create, comprehend, and appreciate music	<ul style="list-style-type: none"> <li>• Playing a musical instrument</li> <li>• Composing a musical work</li> <li>• Identifying the underlying structure of music</li> </ul>
<b>Bodily–kinesthetic intelligence:</b> Ability to use one’s body skillfully	<ul style="list-style-type: none"> <li>• Dancing</li> <li>• Playing basketball</li> <li>• Performing pantomime</li> </ul>
<b>Interpersonal intelligence:</b> Ability to notice subtle aspects of other people’s behaviors	<ul style="list-style-type: none"> <li>• Reading other people’s moods</li> <li>• Detecting other people’s underlying intentions and desires</li> <li>• Using knowledge of others to influence their thoughts and behaviors</li> </ul>
<b>Intrapersonal intelligence:</b> Awareness of one’s own feelings, motives, and desires	<ul style="list-style-type: none"> <li>• Identifying the motives guiding one’s own behavior</li> <li>• Using self-knowledge to relate more effectively with others</li> </ul>
<b>Naturalist intelligence</b> Ability to recognize patterns in nature and differences among various life-forms and natural objects	<ul style="list-style-type: none"> <li>• Identifying members of particular plant or animal species</li> <li>• Classifying natural forms (e.g., rocks, types of mountains)</li> <li>• Applying one’s knowledge of nature in such activities as farming, landscaping, or animal training</li> </ul>

<sup>a</sup>This example may remind you of Piaget’s theory of cognitive development. Many of the stage-specific characteristics that Piaget described reflect logical–mathematical intelligence. Sources: Gardner, 1983, 1999.

abilities in other areas. He also points out that people who suffer brain damage sometimes lose abilities that are restricted primarily to one intelligence. One person might show deficits primarily in language, whereas another might have difficulty with tasks that require spatial reasoning.


Among psychologists, reviews of Gardner’s theory are mixed (Roberts & Lipnevich, 2012). Some theorists don’t believe that Gardner’s evidence is sufficiently compelling to support the notion of eight or nine distinctly different abilities (N. Brody, 1992; Corno et al., 2002; Sternberg, 2003; Waterhouse, 2006). Others agree that people may have a variety of relatively independent abilities but argue for different distinctions than those Gardner makes (e.g., note the second-stratum abilities in the Cattell–Horn–Carroll theory just described). Still others reject the idea that abilities in certain domains, such as in music or bodily movement, are really “intelligences” per se (Bracken, McCallum, & Shaughnessy, 1999; Sattler, 2001).

Despite researchers’ lukewarm reception of Gardner’s theory, many educators have wholeheartedly embraced it because of its optimistic view of human potential. Gardner’s perspective encourages us to use many different teaching methods so that we can capitalize on students’ diverse talents to help them learn and understand classroom subject matter (L. Campbell, Campbell, & Dickinson, 1998; Gardner, 2000b; Kornhaber, Fierros, & Veenema, 2004).

Whether or not human beings have eight or more distinctly different intelligences, they certainly benefit when they’re encouraged to think about a particular topic in two or more distinctly different ways—perhaps using both words and mental images (R. E. Mayer, 2011b; Moreno, 2006). We won’t always want to teach to students’ strengths, however. We must also give students tasks that encourage them to address and thereby strengthen their areas of weakness (Sternberg, 2002).

### STERNBERG’S THEORY OF SUCCESSFUL INTELLIGENCE

Robert Sternberg (e.g., 1998, 2004, 2012; Sternberg et al., 2000) has speculated that people may be more or less intelligent in three different domains. His Triarchic Theory of Intelligence (also sometimes referred to as the *Theory of Successful Intelligence*) focuses on how our skills and abilities

 Present classroom subject matter using a variety of approaches to capitalize on students’ diverse abilities, but also give them tasks that require them to work on areas of weakness.

in these domains help us to achieve our short-term and long-term goals. *Analytical intelligence* involves making sense of, analyzing, contrasting, and evaluating the kinds of information and problems often seen in academic settings and on intelligence tests. *Creative intelligence* involves imagination, invention, and synthesis of ideas within the context of new situations. *Practical intelligence* involves applying knowledge and skills effectively to manage and respond to everyday problems and social situations. Sternberg has argued that traditional views of intelligence have focused too narrowly on academic success, and have neglected the role of intelligence in our everyday lives.

In addition, Sternberg proposes that intelligent behavior involves an interplay of three factors, all of which vary from one occasion to the next (Sternberg, 1985, 1997, 2003):

- *The environmental context in which the behavior occurs.* Different behaviors may be more or less adaptive and effective in different cultures. For example, learning to read is an adaptive response in industrialized societies yet largely irrelevant to certain other cultures.
- *The relevance of prior experiences to a particular task.* Prior experiences can enhance intelligence in either of two ways. In some cases extensive practice with a particular kind of task enables students to perform that task with increasing speed and efficiency—that is, with greater *automaticity*. For example, as children get more practice multiplying double-digit numbers (e.g.,  $32 \times 55$ ), their speed and efficiency at solving such problems increases. In other instances, students are able to draw on what they've learned in previous situations to help them with *new* tasks. For example, students may apply algebraic principles learned in math classes to problems in physical science.
- *The cognitive processes required by the task.* Numerous cognitive processes are involved in intelligent behavior: separating important information from irrelevant details, identifying possible problem-solving strategies, seeing relationships among seemingly different ideas, and so on. Different cognitive processes may be more or less important in different contexts, and an individual may behave more or less intelligently depending on the specific cognitive processes needed at the time.

There is some evidence that the three components of the theory of successful intelligence can be measured, and that assessments in these domains are related to important educational outcomes (Sternberg, 2010; Sternberg et al., 2014). In addition, recent research from the field of neuroscience suggests that similar processes are involved in creative and intellectual thinking (Silvia, 2015; Sternberg, 2003). However, empirical research supporting these three components is limited at this time (Roberts & Lipnevich, 2012). Nevertheless, the theory reminds us that students' ability to behave intelligently may vary considerably depending on the cultural context, previously learned knowledge and skills, and the cognitive processes that a task involves.

## DEVELOPMENTAL VIEWS OF INTELLIGENCE

Theories of cognitive development portray children as becoming increasingly intelligent over time; for example, with age and experience children gain greater proficiency in abstract thinking (Jean Piaget's theory) and effective use of complex cultural tools (Lev Vygotsky's theory). Yet with the possible exception of Sternberg's triarchic theory—which points out the importance of prior experiences—the perspectives of intelligence described so far don't really consider how intelligence might take different forms at different points in development (Dai, 2010).

Some psychologists working in the area of giftedness suggest that not only is intelligence somewhat specific to particular domains but also that its basic nature changes with age and experience. From this perspective, the developmental course of exceptional abilities and talents is as follows:

1. Initially (typically in childhood), people show exceptional *potential* in a certain domain, perhaps in reading, math, or music.
2. With appropriate instruction, guidance, and practice opportunities, people show exceptional *achievement* in the domain.
3. If people continue to pursue the domain and practice domain-specific tasks over a lengthy time period (typically into adulthood), they may eventually gain considerable *expertise and eminence*, to the point that their accomplishments are widely recognized (Dai, 2010; Subotnik, Olszewski-Kubilius, & Worrell, 2011).

Chapter 6 looks more closely at automaticity.

Chapter 2 describes Piaget's and Vygotsky's theories of development.

In addition, increases in more general cognitive abilities are related to experiences such as school attendance, work experiences, and other life events (Kyllonen, 2015). Here, then, we see a very dynamic view of intelligence: Although its roots may be in certain natural endowments, over the long run intelligence requires both environmental nurturance and personal perseverance (Dai, 2010; Subotnik et al., 2011)

### DISTRIBUTED INTELLIGENCE

Many psychologists are beginning to realize that not only does a supportive environmental context enhance people's intelligence over time, but in fact it can facilitate intelligent behavior in the here and now. People are far more likely to think and behave intelligently when they have assistance from their physical, cultural, and social environments—an idea that is sometimes called **distributed intelligence** (e.g., Hutchins, 1995; Pea, 1993; Perkins, 1995). People can “distribute” a challenging task—that is, they can pass some of the cognitive burden onto something or someone else—in at least three ways. First, they can use physical objects, especially technology (e.g., tablets, calculators, computers), to handle and manipulate large amounts of information. In particular, having a smartphone available virtually at any time and in any place affords students the opportunity to access information and various tools. Second, they can represent and think about the situations they encounter by using their culture's various symbolic systems—words, charts, diagrams, and so on—and other cognitive tools. And third, they can work with other people to explore ideas and solve problems—as we've often heard, two heads are (usually) better than one. In fact, when students work together on complex, challenging tasks and problems, they teach one another strategies and ways of thinking that can help each of them think even *more* intelligently on future occasions (Kuhn, 2001b; Palincsar & Herrenkohl, 1999; Slavin, 2011).

From a distributed-intelligence perspective, then, intelligence is a highly variable, context-specific ability that increases when appropriate environmental supports are available. It certainly isn't an immutable trait that learners “carry around” with them, nor is it something that can be easily measured and then summarized with one or more test scores. However, psychologists coming from other theoretical perspectives often *do* try to measure intelligence, as we'll see now.

### MEASURING INTELLIGENCE

When a student consistently struggles with certain aspects of the school curriculum, as Tim does in the opening case study, psychologists sometimes find it helpful to get a measure of the student's general level of cognitive functioning. Such measures are commonly known as **intelligence tests**. To get a sense of what intelligence tests are like, try the following exercise.

### EXPERIENCING FIRSTHAND

#### MOCK INTELLIGENCE TEST

Answer each of these questions:


1. What does the word *penitence* mean?
2. How are a goat and a beetle alike?
3. What should you do if you get separated from your family in a large department store?
4. What do people mean when they say, “A rolling stone gathers no moss”?

5. Complete the following analogy:  $\blacktriangle$  is to  $\triangle$  as  $\bigcirc$  is to:

- a.  $\bullet\bullet$       b.  $\bullet\bigcirc$       c.  $\bigcirc$       d.  $\triangleleft$

These test items are modeled after items on many contemporary intelligence tests. Often the tests include a mixture of verbal tasks (such as items 1 through 4) and less verbal, more visual tasks (such as item 5).

Scores on intelligence tests were originally calculated using a formula that involves division. Hence, they were called intelligence quotient scores, or **IQ scores**. Although we still use the term IQ, intelligence test scores are no longer based on the old formula. Instead, they're

 Identify physical, symbolic, and social supports that can help students think more intelligently.



MyEdLab

#### Video Example 5.1.

Children can think and behave more intelligently when they acquire the cognitive tools of their culture, such as strategies for organizing and graphing data.

determined by comparing a student's performance on a given test with the performance of others in the same age-group. This is a very important point—an IQ score is reflective of a student's cognitive abilities at a particular age, compared to students of the same age. A score of 100 indicates average performance on the test: Students with this score have performed better than half of their age-mates but not as well as the other half. Scores well below 100 indicate below-average performance on the test; scores well above 100 indicate above-average performance.

Figure 5.1 shows the percentages of students getting scores at different points along the scale (e.g., 12.9% get scores between 100 and 105). Notice that the curve is high in the middle and low at both ends, indicating that scores close to 100 are far more common than scores considerably higher or lower than 100. For example, if we add up the percentages in different parts of Figure 5.1, we find that approximately two-thirds (68%) of students score within 15 points of 100 (i.e., between 85 and 115). In contrast, only 2% of students score as low as 70, and only 2% score as high as 130. Such a many-in-the-middle-and-few-at-the-extremes distribution of scores seems to characterize a wide variety of human characteristics. Hence, psychologists have created a method of scoring intelligence test performance that intentionally yields this distribution.

In the opening case study, Tim's performance on an intelligence test yields an IQ score of 96, which we can now make some sense of. As you can see in Figure 5.1, a score of 96 is so close to 100 that we should consider it to be well within an average range.

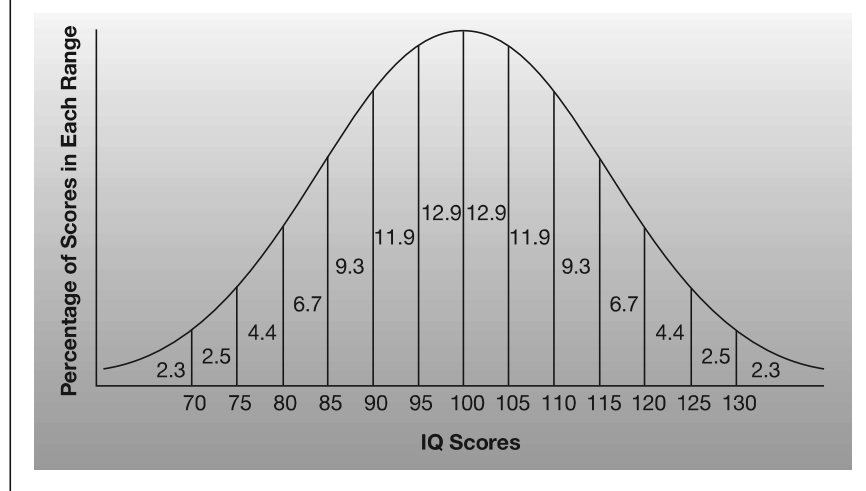
Researchers are still studying intelligence and designing new assessments of intelligence. It has become particularly apparent in recent years that other noncognitive variables (e.g., motivation and persistence) are related to intelligence. In addition, new techniques are being developed to account for the fact that some individuals work quickly through assessments (and thus may complete more of the assessment, but may commit more errors because of going quickly), whereas other test takers are more slow and deliberate, and may achieve greater levels of accuracy, but not complete as many items (van der Linden, 2007).

## IQ SCORES AND SCHOOL ACHIEVEMENT

Studies repeatedly show that performance on intelligence tests is correlated with school achievement. On average, children with higher IQ scores earn higher course grades, do better on standardized achievement tests, and complete more years of education (N. Brody, 1997; Duckworth, Quinn, & Tsukayama, 2012; Sattler, 2001). Data suggest that these tests are predictive of success in higher education as well (Kuncel & Hezlett, 2007).

It's important to keep three points in mind about this IQ–achievement relationship. First, intelligence doesn't necessarily *cause* achievement; it is simply correlated with it. Even though students with high IQs typically perform well in school, we cannot conclusively say that their high achievement is actually the result of their intelligence. Intelligence probably does play an important role in school achievement, but so, too, do many other factors—motivation, quality of instruction, family and neighborhood resources, peer-group expectations, and so on. Second, the relationship between IQ scores and achievement is an imperfect one, with many exceptions to the rule. For a variety of reasons, some students with high IQ scores don't perform well in the classroom, and others achieve at higher levels than we would predict from their IQ scores alone. For example, recent research suggests that the relation between intelligence and achievement is affected by sleep—when students do not get enough sleep on any given night, intelligence and achievement aren't as closely correlated as they might otherwise be (Erath, Tu, Buckhalt, & El-Sheikh, 2015). Third and most important, we must remember that an IQ score simply reflects a

**FIGURE 5.1** Percentages of IQ scores in different ranges.



If you have taken a course in descriptive statistics, you may realize that IQ scores are *standard scores* based on the *normal distribution*. Chapter 15 explains these concepts.



Don't use students' IQ scores to make long-term predictions about school achievement.

child's performance on a particular test at a particular time—it's *not* a permanent characteristic etched in stone—and that some change is to be expected over time.

## NATURE AND NURTURE IN THE DEVELOPMENT OF INTELLIGENCE

Research tells us that heredity probably plays some role in intelligence. For instance, identical twins tend to have more similar IQ scores than nonidentical (fraternal) twins do, even when the twins are adopted at birth by different parents and grow up in different homes. This is *not* to say, however, that children inherit a single IQ gene that determines their intellectual ability. Rather, they probably inherit a variety of characteristics that in one way or another affect particular cognitive abilities and talents (O. S. P. Davis, Haworth, & Plomin, 2009; Horn, 2008; Kan, Wicherts, Dolan, & van der Maas, 2013; Kovas & Plomin, 2007).

Environmental factors influence intelligence as well, sometimes for the better and sometimes for the worse. Poor nutrition in the early years of development (including the 9 months before birth) leads to lower IQ scores, as does a mother's excessive use of alcohol during pregnancy (Neisser et al., 1996; Ricciuti, 1993; Sigman & Whaley, 1998). Moving a child from a neglectful, impoverished home environment to a more nurturing, stimulating one (e.g., through adoption) can result in IQ gains of 15 points or more (Beckett et al., 2006; Capron & Duyme, 1989; van IJzendoorn & Juffer, 2005). Effective, too, are long-term intervention programs designed to help children acquire basic cognitive and academic skills (e.g., F. A. Campbell & Burchinal, 2008; Kağitçibaşı, 2007). Even simply *going to school* has a positive effect on IQ scores (Ceci, 2003; Ramey, 1992), and attending an academically rigorous school may be particularly related to gains in intelligence, even during adolescence (Becker, Lüdtke, Trautwein, Köller, & Baumert, 2012). Furthermore, worldwide, there has been a slow but steady increase in people's performance on intelligence tests—a trend that is probably due to better nutrition, smaller family sizes, better schooling, increasing cognitive stimulation (through increased access to technology, reading materials, etc.), and other improvements in people's environments (Flynn, 2007; E. Hunt, 2008; Neisser, 1998).

The question of how *much* nature and nurture each play a role in influencing intelligence has been a source of considerable controversy over the years. But in fact, genetic and environmental factors interact in their influences on cognitive development and intelligence in ways that can probably never be disentangled. First of all, genes require reasonable environmental support to do their work. In an extremely impoverished environment—one with a lack of adequate nutrition and stimulation—heredity may have little to say about children's intellectual growth, but under better circumstances it can have a significant influence (Ceci, 2003; D. C. Rowe, Jacobson, & Van den Oord, 1999; Turkheimer, Haley, Waldron, D'Onofrio, & Gottesman, 2003). Second, heredity seems to affect how susceptible or impervious a child is to particular environmental conditions (Rutter, 1997). For instance, some students—such as those with certain inherited disabilities, like Tim in the opening case study—may need a quiet, well-structured learning environment in which to acquire good reading comprehension skills, but other students might pick up good reading skills regardless of the quality of their environment. Third, children tend to seek out environmental conditions that match their inherited abilities (O. S. P. Davis et al., 2009; W. Johnson, 2010; Scarr & McCartney, 1983). For example, children who inherit exceptional quantitative reasoning ability may enroll in advanced math courses and in other ways nurture their inherited talent. Children with average quantitative ability are less likely to take on such challenges and thus have fewer opportunities to develop their mathematical skills.

## INTELLIGENCE AND THE BRAIN

Intelligence—at least that aspect of intelligence that can be measured by IQ tests—does seem to have some basis in the brain (Karama et al., 2011). A high level of intelligence also seems to involve ongoing, efficient interactions among numerous brain regions (Jung & Haier, 2007). Research conducted by neuroscientists suggests that numerous components of intelligence are related to the brain and its development, including basic cognitive skills in young children, memory, attention, reading, and mathematics ability (Byrnes, 2012). Although heredity appears to play some role in these differences, the extent to which they are the result of nature, nurture, or a nature–nurture interaction remains to be seen (Jung & Haier, 2007). And in any case, we must

See Chapter 2 for more information on the structure, development, and plasticity of the human brain.



remember that the human brain has considerable ability to restructure itself—that is, it has *plasticity*—throughout childhood and adulthood.

## CULTURAL AND ETHNIC DIVERSITY IN INTELLIGENCE

Historically, some ethnic groups in the United States have, *on average*, performed better than other ethnic groups on intelligence tests. Most experts agree that such group differences in IQ scores are probably due to differences in environment and, more specifically, to economic circumstances that affect the quality of prenatal and postnatal nutrition, availability of stimulating books and toys, access to educational opportunities, and so on (Brooks-Gunn, Klebanov, & Duncan, 1996; Byrnes, 2003; McLoyd, 1998). Furthermore, various groups have become increasingly *similar* in average IQ score in recent years—a trend that can be attributed only to more equitable environmental conditions (Dickens & Flynn, 2006; Neisser et al., 1996).

Yet it's important to note that different cultural groups have somewhat different views about what intelligence *is* and may therefore nurture somewhat different abilities in their children (Saklofske et al., 2015). Many people of European descent think of intelligence primarily as an ability that influences children's academic achievement and adults' professional success. In contrast, people in many African, Asian, Hispanic, and Native American cultures think of intelligence as involving social as well as academic skills—maintaining harmonious interpersonal relationships, working effectively together to accomplish challenging tasks, and so on (Greenfield et al., 2006; J. Li & Fischer, 2004; Sternberg, 2004, 2007). In Buddhist and Confucian societies in the Far East (e.g., China, Taiwan), intelligence also involves acquiring strong moral values and making meaningful contributions to society (J. Li, 2004; Sternberg, 2003).

Cultural groups differ, too, in the behaviors that they believe reflect intelligence. For example, many traditional measures of intelligence take speed into account on certain test items: Children score higher if they respond quickly as well as correctly. Yet people in some cultures tend to value thoroughness over speed and may be skeptical when tasks are completed very quickly (Sternberg, 2007). As another example, many people in mainstream Western culture interpret strong verbal skills as a sign of intelligence, but for many Japanese and many Inuit people of northern Quebec, talking a lot indicates immaturity or low intelligence (Crago, 1988; Minami & McCabe, 1996; Sternberg, 2003). One Inuit teacher had this concern about a boy whose language was quite advanced for his age-group:

Do you think he might have a learning problem? Some of these children who don't have such high intelligence have trouble stopping themselves. They don't know when to stop talking. (Crago, 1988, p. 219)

As teachers, then, we must be careful not to assume that our own views of intelligence are shared by the students and families of cultures very different from our own.

## BEING SMART ABOUT INTELLIGENCE AND IQ SCORES

Whatever its nature and origins may be, intelligence appears to be an important factor in students' ability to learn and achieve in the classroom. Accordingly, we must have a good grasp of how we can best nurture students' intellectual growth and how we can reasonably interpret their performance on intelligence tests and use that information wisely. Following are several recommendations.

- 🍏 *Place higher priority on developing—rather than on determining—intelligence.* As we've seen, intelligence is hardly a fixed, unchangeable characteristic: Environmental factors, including schooling, can lead to increases in children's measured intelligence. And the notion of distributed intelligence suggests that virtually all students can act more intelligently when they have tools, symbolic systems, and social groups to assist them. As teachers, we should think more about *enhancing and supporting* students' intelligence than about measuring it (Dai, 2010; P. D. Nichols & Mittelholtz, 1997; Posner & Rothbart, 2007; B. Rhodes, 2008).
- 🍏 *Think of intelligence tests as useful but imperfect measures.* Intelligence tests aren't magical instruments that mysteriously determine a learner's true intelligence—if, in fact, such a thing as



Assume that when children from diverse ethnic groups all have reasonably stimulating environments, they have equal potential to develop their intellectual abilities.



When meeting with students' parents, remember that those from diverse backgrounds may value different aspects of intelligence.

Young children's distractibility during a testing session decreases the *reliability* of any test scores obtained (see Chapter 14 and Chapter 15).



Be skeptical of any IQ scores obtained for recent immigrants and other students who were not fluent in English when tested. In general, never base expectations for students' achievement *solely* on IQ scores.



Don't use so-called "intelligence tests" you find posted on the Internet.

Chapter 14 provides more details about dynamic assessment.

"true" intelligence exists. Instead, these tests are simply collections of questions and tasks that psychologists have developed in order to get a handle on how well students can think, reason, and learn at a particular point in time. Used in conjunction with other information, they can often give us a general idea of a student's current cognitive functioning. To interpret IQ scores appropriately, however, we must be aware of their limitations:

- Different kinds of tests can yield somewhat different scores.
- A student's performance on any test will inevitably be affected by many temporary factors—general health, time of day, distracting circumstances, and so on. Such factors are especially influential for young children, who are apt to have high energy levels, short attention spans, and little interest in sitting still for more than a few minutes.
- Test items typically focus on certain skills that are important in mainstream Western culture—especially in school settings—and on tasks that can be accomplished within a single, short testing session. They don't necessarily tap into skills that are more highly valued and nurtured in other cultures, nor do they tap into skills that involve lengthy time periods (e.g., planning ahead, making wise decisions) or highly specific areas.
- Some students may be unfamiliar with the content or types of tasks involved in particular test items and may perform poorly on those items as a result.
- English language learners—students who have only limited proficiency in English as a result of growing up in a non-English-speaking environment—are at an obvious disadvantage when an intelligence test is administered in English. Thus, their IQ scores will typically be poor indicators of what they will be able to do once their English improves. (Dirks, 1982; Heath, 1989; Neisser et al., 1996; Olvera, & Gómez-Cerrillo, 2014; Perkins, 1995; Stanovich, 2009; Sternberg, 2007; Sternberg, Grigorenko, & Kidd, 2005)

Obviously, then, we must be skeptical of IQ scores obtained for students who come from diverse cultural backgrounds, know little English, or were fairly young at the time of assessment.

- 🍏 *Use the results of more focused measures when you want to assess specific abilities.* Whenever we obtain and use IQ scores, we're buying into the idea that a general factor, or *g*, underlies students' school performance. But given the multifaceted nature of intelligence, no single test can possibly give us a complete picture of a student's abilities. If we want to estimate a student's potential for success in a particular domain—say, in mathematics—we're probably better off using measures of more specific abilities (Ackerman & Lohman, 2006; Horn, 2008; McGrew et al., 1997). However, we urge you to rely *only* on instruments available from well-respected test publishers. Tests you might find on the Internet—for instance, tests that claim to be measures of Gardner's multiple intelligences—have typically undergone little or no research scrutiny, making their results questionable at best. Keep in mind, too, that intelligence tests should be administered only by school psychologists and other professionals who have been specifically trained in their use.
- 🍏 *Look for behaviors that reveal exceptional talents within the context of a student's culture.* For example, among students who have grown up in predominantly African American communities, intelligence might be reflected in oral language, such as colorful speech, creative storytelling, or humor. For students from Native American cultures, intelligence might be reflected in interpersonal skills, highly skilled craftsmanship, or an exceptional ability to notice and remember subtle landmarks in one's physical environment (Dai, 2010; Sternberg, 2005; Torrance, 1989).  
As teachers, then, we must be careful not to limit our conception of intelligence only to students' ability to succeed at traditional academic tasks and to perform well on traditional intelligence tests. One alternative is *dynamic assessment*: Rather than assess what students already know and can do, we might teach them something new and see how quickly and easily they master it (Feuerstein, Feuerstein, & Falik, 2010; Haywood & Lidz, 2007; Sternberg, 2007).
- 🍏 *Remember that many other factors also affect students' classroom achievement.* Most measures of intelligence focus on specific things that a student *can* do, with little consideration of

what a student is *likely* to do. For instance, intelligence tests don't evaluate the extent to which students are willing to view a situation from multiple perspectives, examine data with a critical eye, try hard even when faced with a difficult question, or actively take charge of their own learning. Yet such traits are often just as important as intellectual ability in determining success on academic and real-world tasks (Duckworth & Seligman, 2005; Kuhn, 2001a; Perkins, Tishman, Ritchhart, Donis, & Andrade, 2000). Even teachers' expectations for students can have small effects on students' intelligence test scores (Raudenbush, 1984). In the next section we'll examine forms that these *cognitive styles and dispositions* might take.

Chapter 11 discusses the relations between teacher expectations and student achievement.

#### MyEdLab Self-Check 5.1

**MyEdLab Application Exercise 5.1.** In this interactive exercise you can practice identifying ways in which teachers nurture intelligence in their diverse students.



## Cognitive Styles and Dispositions

Students with the same general level of intelligence often approach classroom tasks and think about classroom topics differently. Some of these individual differences reflect **cognitive styles**, over which students don't necessarily have much conscious control. Others reflect **dispositions**, which students voluntarily and intentionally bring to bear on their efforts to master school subject matter. Don't agonize over the distinction between the two concepts, because their meanings overlap considerably. Both involve not only specific cognitive tendencies but also personality characteristics (Furnham, 2012; Messick, 1994b; Zhang & Sternberg, 2006). Dispositions also have a motivational component—an *I-want-to-do-it-this-way* quality (Kuhn, 2001a; Perkins & Ritchhart, 2004; Stanovich, 1999).

### DO STUDENTS HAVE DISTINCT LEARNING STYLES?

Over the past few decades, psychologists and educators have examined a wide variety of cognitive styles, sometimes instead using the term *learning styles*. You probably have heard of educators discussing students as perhaps being “visual learners” or “auditory learners.” The notion behind learning styles is that if teachers adjust instruction to meet the favored learning styles of individual students, then learning will be enhanced. Thus, if a “visual learner” is provided with extra visual materials when learning about a new topic, that student's learning will be improved.

Despite the popularity of this idea among educators, there is virtually no evidence that adapting instruction to students' learning styles has any effect on their actual learning (Curry, 1990; R. E. Mayer & Massa, 2003; Nieto & Bode, 2008; Rogowsky, Calhoun, & Tallal, 2015; Roher & Pashler, 2012; Snider, 1990). Many of the styles that have been identified and assessment instruments that have been developed don't hold up under the scrutiny of researchers (Cassidy, 2004; Krätzig & Arbutnott, 2006; Messick, 1994b). Learning “styles” are basically just preferences; some students may indicate that they prefer to learn through listening, whereas others may indicate that they prefer to learn visually. Nevertheless, these preferences are just that—preferences. It is not the case that students with one preferred style cannot learn just as well when information is presented in other ways.

In fact, adapting instruction to students' preferred learning styles, or even telling students that they may have a learning style, may prove to be detrimental to learning. Consider the following example:


Harper is a sixth grader who does very well in school. On her mid-year report card, Harper's science teacher noted, “Harper does a great job in class; I just wish that she would participate more in our discussions.” When Harper's parents asked her why she did not participate more in class, she responded that “the guidance counselor came in and gave us a test on our learning styles; she told me that I'm a visual learner. Since I am a visual learner, I don't really need to talk to learn; I just watch.”

Why is this situation troubling? First, as we noted before, assessments of learning styles are generally not scientifically verified (and these “styles” are really just preferences). Second, and more disturbing, Harper has interpreted the information about being a visual learner as suggesting that she perhaps is weak in other areas, and thus does not need to learn with other modalities. If Harper is a quiet student, then we might recommend greater verbal interaction so that she can further develop her verbal skills; however, her naïve interpretation of the information about her visual learning style may actually cause her to talk even less!

## DOES IT MAKE SENSE TO TEACH TO STUDENTS’ “RIGHT BRAINS” OR “LEFT BRAINS”?

As a teacher you will probably hear about lessons, materials, and curricula that have been developed based on the latest findings from neuroscience; sometimes this is referred to as *brain-based learning* or *brain-based education*. Neuroscience is a growing area of research with exciting new discoveries emerging all the time; however, most researchers agree that it is too early to be applying this research to daily classroom instruction.

One area that has received much attention is the notion of adapting instruction to the “left brain” or the “right brain.” Neuroscientists, in fact, have completely debunked the idea that we might teach to students’ “left brains” or “right brains”: Even the simplest of everyday thinking tasks requires the left and right hemispheres of the brain to work together (Bressler, 2002; Gonsalves & Cohen, 2010; Haxby et al., 2001; Kalbfleisch & Gillmarten, 2013; Organization for Economic Cooperation and Development, 2015).

 Don't plan instruction based on results you might get from easily available and aggressively marketed “learning style” inventories or “brain-based curricula.”



MyEdLab

### Video Example 5.2.

Some learners tend to use analytic thinking, but others use holistic thinking. Teachers can use strategies that facilitate the types of thinking required for specific learning tasks and help students learn to think both analytically and holistically.

Chapter 7 describes critical thinking more thoroughly.

## ANALYTIC AND HOLISTIC THINKING

One dimension of cognitive style worthy of our attention, however, is a distinction between analytic and holistic thinking. In *analytic* thinking, learners tend to break new stimuli and tasks into their component parts and to see these parts somewhat independently of their context. In *holistic* thinking, learners tend to perceive situations as integrated, indivisible wholes that are closely tied to their context. Researchers have found cultural differences here: People from mainstream Western culture tend to be analytic thinkers, whereas people from East Asian cultures think more holistically (Park & Huang, 2010; Varnum, Grossmann, Kitayama, & Nisbett, 2010). In general, logical and scientific reasoning requires analytic thinking, but holistic thinking can help learners identify associations and relationships among seemingly very different phenomena. For example, holistically minded Chinese scientists identified the underlying cause of the ocean's tides—the moon's gravitational pull on any large body of water—many centuries before more narrowly focused, earth-centered European scientists did (Nisbett, 2009).

In contrast to the mixed research findings regarding cognitive styles and learning styles, research on dispositions has yielded more consistent and fruitful results. Some kinds of dispositions are clearly beneficial for classroom learning:

- *Stimulation seeking*: Eagerly interacting with one's physical and social environment in order to gain new experiences and information
- *Need for cognition*: Regularly seeking and engaging in challenging cognitive tasks
- *Critical thinking*: Consistently evaluating information or arguments in terms of their accuracy, credibility, and worth, rather than accepting them at face value
- *Open-mindedness*: Flexibly considering alternative perspectives and multiple sources of evidence, and suspending judgment for a time rather than leaping to immediate conclusions (Cacioppo, Petty, Feinstein, & Jarvis, 1996; DeBacker & Crowson, 2008, 2009; Furnham, 2012; Halpern, 2008; Kang et al., 2009; Raine, Reynolds, & Venables, 2002; Southerland & Sinatra, 2003; Stanovich, 1999; West, Toplak, & Stanovich, 2008)

Such dispositions are often positively correlated with students' learning and achievement, and many theorists have suggested that they play a causal role in what and how much students learn. In fact, dispositions sometimes overrule intelligence in their influence on long-term achievement (Dai & Sternberg, 2004; Kuhn & Franklin, 2006; Perkins & Ritchhart, 2004). For instance, children who eagerly seek out physical and social stimulation as preschoolers later become better readers and earn better grades in school (Raine et al., 2002). Students with a high need for

cognition learn more from what they read and are more likely to base conclusions on sound evidence and logical reasoning (Cacioppo et al., 1996; Dai, 2002; P. K. Murphy & Mason, 2006). And students who critically evaluate new evidence and open-mindedly listen to diverse perspectives show more advanced reasoning capabilities and are more likely to revise their beliefs in the face of contradictory information (DeBacker & Crowson, 2009; G. Matthews, Zeidner, & Roberts, 2006; Southerland & Sinatra, 2003).

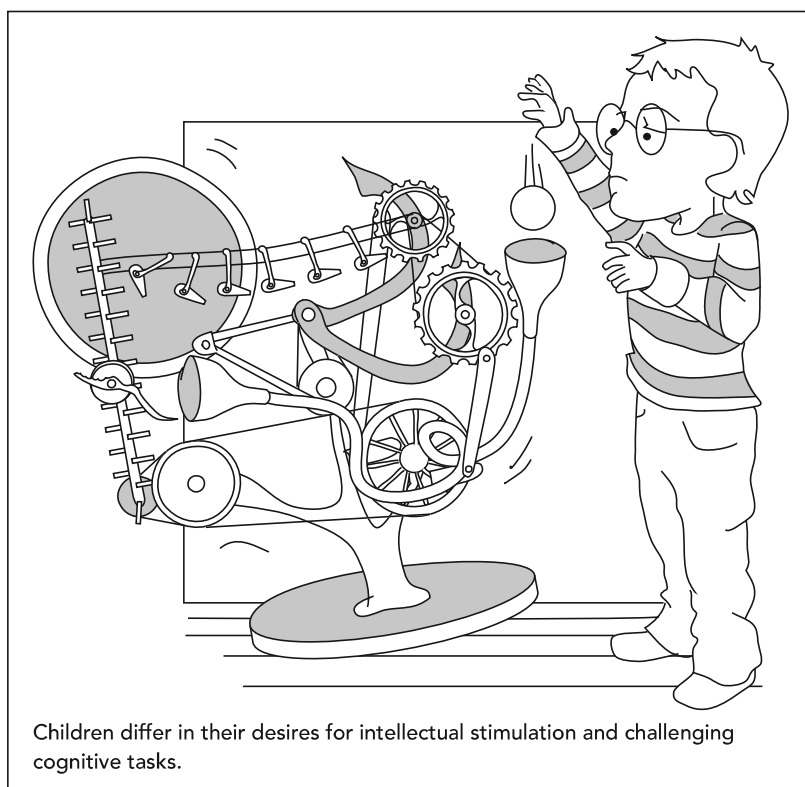
Researchers haven't yet systematically addressed the origins of various dispositions. Perhaps inherited temperamental differences (e.g., in stimulation seeking) are involved (Raine et al., 2002). Beliefs about the underlying nature of knowledge—for instance, the belief that knowledge is fixed and unchanging, on the one hand, or dynamic and continually evolving, on the other—may also play a role (P. M. King & Kitchener, 2002; Kuhn, 2001b; Mason, 2003). And almost certainly teachers' actions and the general classroom atmosphere they create—for example, whether students are encouraged to pursue intriguing topics, take risks, and think critically—make a difference (Flum & Kaplan, 2006; Gresalfi, 2009; Kuhn, 2001b, 2006). In the following classroom interaction, a teacher actually seems to *discourage* any disposition to think analytically and critically about classroom material:

Write this on your paper . . . it's simply memorizing this pattern. We have meters, centimeters, and millimeters. Let's say . . . write millimeters, centimeters, and meters. We want to make sure that our metric measurement is the same. If I gave you this decimal, let's say .234 m (yes, write that). In order to come up with .234 m in centimeters, the only thing that is necessary is that you move the decimal. How do we move the decimal? You move it to the right two places. . . . Simple stuff. (Turner, Meyer, et al., 1998, p. 741)

Undoubtedly this teacher means well, but notice the noncritical attitude she communicates: "Write this . . . it's simply memorizing this pattern." The Into the Classroom feature "Promoting Productive Dispositions" offers strategies that are more likely to be effective.

#### MyEdLab Self-Check 5.2

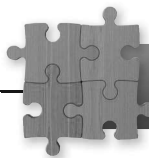
**MyEdLab Application Exercise 5.2.** This interactive exercise allows you to practice identifying teaching strategies that promote productive dispositions.



Beliefs about the underlying nature of knowledge are known as *epistemic beliefs* (see Chapter 7).

## Educating Students with Special Needs in General Education Classrooms

As teachers, we can typically accommodate many students' varying abilities and dispositions within the context of a single curriculum and everyday classroom lessons. But we're also likely to have **students with special needs**—students who are different enough from their peers that they require specially adapted instructional materials and practices to help them maximize their learning and achievement. Some of these students have cognitive, personal, social, or physical disabilities that adversely affect their performance in a typical classroom. Others, instead, are so advanced in a particular domain—that is, they are *gifted*—that they gain little from grade-level activities and assignments.



## Into The Classroom

### Promoting Productive Dispositions

**🍏 Communicate your own eagerness to learn about and master new topics.**

In a unit on poetry, a middle school English teacher says, “In our culture we’re accustomed to poems that rhyme and have a steady beat. But many centuries ago the Japanese developed a very different form of poetry. This form, called *haiku*, is really cool. I’ll give you some of my favorite examples, and then as a class we’ll create some new haiku.”

**🍏 Model open-mindedness about diverse viewpoints and a willingness to suspend judgment until all the facts are in.**

In a lesson about the properties of air—especially the fact that it takes up space—a first-grade teacher asks her students to predict whether the inside of a glass will get wet or stay dry when it is pushed upside down into a bowl of water. After the glass has been immersed, students come to different conclusions about the wetness or dryness of its inside. The teacher responds, “Uh-oh. Now we have two different opinions. We are going to have to figure out how to solve this problem.” She devises a simple strategy—stuffing a crumpled paper towel into the glass and then re-immersing it in the water—to get more conclusive evidence.

**🍏 Conduct learning activities in which students collaborate to address intriguing, multifaceted issues.**

A few weeks before a national presidential election, a high school social studies teacher says to his class, “Many of the campaign ads we see on television now are harshly criticizing opposing candidates, and some of them may be misrepresenting the facts. In your cooperative groups today, you’ll be looking at transcripts of three political ads, one each from a different candidate’s campaign. Each group has at least two laptops or tablets with wi-fi. Your job is to be fact checkers—to search the Internet for credible websites that can either confirm or disconfirm what the candidates are saying about their own records or those of their opponents. Tomorrow we’ll compare the findings of various groups.”

**🍏 Ask students to evaluate the quality of scientific evidence, and scaffold their efforts sufficiently that they can reach appropriate conclusions.**

Working in pairs, fifth graders conduct “experiments” in a computer program that simulates the effects of various factors (amount of rainfall, rate of snowmelt, type of soil, etc.) on local flooding. To guide students’ inquiry, the program asks them to form and then test specific hypotheses, and it occasionally asks them if a particular series of tests has controlled for other potentially influential factors.

Sources: Strategies based on discussions by de Jong, 2011; Gresalfi, 2009; Halpern, 1998; Kuhn, 2001b; Perkins & Ritchhart, 2004; vanSledright & Limón, 2006.

In the United States, most students with special educational needs are in general education classrooms for part or all of the school day—a practice known as **inclusion** (U.S. Department of Education, National Center for Education Statistics, 2010). In fact, federal legislation mandates that students with disabilities be educated in neighborhood schools and, ideally, in regular classrooms to the greatest extent possible.

### PUBLIC LAW 94-142: INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA)

In 1975 the U.S. Congress passed Public Law 94-142, which is now known as the **Individuals with Disabilities Education Act (IDEA)**. This act has been amended and reauthorized several times since then, most recently in 2004 under the name *Individuals with Disabilities Education Improvement Act*. It currently grants educational rights from birth until age 21 for people with cognitive, emotional, or physical disabilities. It guarantees several rights for students with disabilities:

- *A free and appropriate education.* All students with disabilities are entitled to a free educational program designed specifically to meet their unique educational needs.
- *Fair and nondiscriminatory evaluation.* A multidisciplinary team conducts an in-depth evaluation of any student who may be eligible for special services. The team’s makeup depends on the student’s needs but typically consists of two or more teachers, any appropriate specialists, and the student’s parent(s) or guardian(s). Using a variety of tests and other evaluation tools, school personnel conduct a complete assessment of potential disabling conditions. Evaluation procedures must take a student’s background and any suspected physical or communication difficulties into account. For example, tests must be administered in a student’s primary language.
- *Education in the least restrictive environment.* To the greatest extent possible, students with disabilities should be included in the same academic environment, extracurricular activities, and social interactions as their nondisabled peers. That is, they must have the **least restrictive environment**, the most typical and standard educational environment that,

with sufficient supplementary aids and support services, can reasonably meet their needs. Exclusion from general education is warranted only when others' safety would be jeopardized or when, even with proper support and assistance, a student can't make appreciable progress in a general education setting.

- *Individualized education program (IEP)*. When an individual aged 3 to 21 is identified as having a disability, the multidisciplinary team collaboratively develops an instructional program, called an **individualized education program (IEP)**, tailored to the individual's strengths and weaknesses (see Figure 5.2). The IEP is a written statement that the team continues to review and, if appropriate, revise at least once a year—more frequently if conditions warrant. IEP meetings are most effective when they (a) are well planned and (b) have a designated meeting facilitator, a clear agenda, and ground rules for how to run the meeting, and when participants (c) have sufficient knowledge about these meetings and avoid using jargon (Diliberto & Brewer, 2014).
- *Due process*. IDEA mandates several practices that ensure that students' and parents' rights are preserved throughout the decision-making process. For instance, parents must be notified in writing before the school takes any action that might change their child's educational program. If the parents and school system disagree on the most appropriate placement for a child, mediation or a hearing can be used to resolve the differences.

IDEA has had a significant impact on the nature of special education. More and more, teachers are realizing that truly inclusive practices require differentiated instruction for *all* students, not just those with formally identified needs. And rather than provide specialized instruction in a separate classroom, many special education teachers now partner with regular classroom teachers to jointly teach all students—both those with disabilities and those without.

## POTENTIAL BENEFITS AND DRAWBACKS OF INCLUSION

Despite the mandates of IDEA, inclusive practices for students with disabilities have been controversial. Some experts argue that students are most likely to develop normal peer relationships and social skills when they participate fully in their school's overall social life. But others worry that when students with special needs are in a regular classroom for the entire school day, they can't get the intensive specialized instruction they may need. Furthermore, nondisabled classmates may stigmatize, avoid, or bully students who appear to be odd or incompetent in some way (Blake, Lund, Zhou, Kwok, & Benz, 2012; Hamovitch, 2007).

Numerous research studies have suggested that attending general education classes for part or all of the school day can have several positive outcomes for students with disabilities:

- Academic achievement equivalent to (and sometimes higher than) that in a self-contained classroom



Provide as typical an educational experience as possible for *all* of your students.



MyEdLab

### Video Example 5.3.

The Individuals with Disabilities Education Act (IDEA) grants educational rights to students with disabilities. When these students are included in the general education classroom, their individualized education program (IEP) is developed by a multidisciplinary team.

**FIGURE 5.2 Components of an individualized education program (IEP).**

In the United States, any IEP written for a student with a disability must include the following information:

- *Current performance*: Information about the student's current school achievement levels, including classroom tests and assignments, teachers' and specialists' observations, and results of individually administered assessments.
- *Annual goals*: objectives or benchmarks for the school year related to the student's academic, social, behavioral, and/or physical needs.
- *Special education and related services*: The special services, supplementary aids, and program modifications that will be provided in order to help the student meet the annual goals.
- *Participation with nondisabled children*: If applicable, explanation of the extent to which the student will *not* participate in regular classroom and extracurricular activities.
- *Measurement of progress*: Information regarding how the student's progress will be monitored and how parents will be informed of this progress.
- *Participation in state and district-wide tests*: Explanation of any modifications or exclusions with respect to regularly administered achievement tests and, if applicable, description of any alternative measures of achievement.
- *Dates and places*: Information regarding when and where services will begin and how long they will continue.
- *Transition services*: For any student aged 14 (or younger, if appropriate), any special services needed for reaching post-school goals and preparing to leave school.

Source: U.S. Department of Education, Office of Special Education and Rehabilitative Services, 2000.



- More appropriate classroom behavior, better social skills, and more frequent interaction with nondisabled peers
- Better sense of self *if* the school environment is one in which all students accept and respect individual differences among their peers (Halvorsen & Sailor, 1990; Hamovitch, 2007; Hattie, 2009; P. Hunt & Goetz, 1997; MacMaster, Donovan, & MacIntyre, 2002; Slavin, 1987; Soodak & McCarthy, 2006; Stainback & Stainback, 1992)

We're especially likely to see such outcomes when students understand the nature of their disabilities and when instruction and materials are tailored to students' specific needs, perhaps in their regular classrooms or perhaps in short resource-room sessions (e.g., H. L. Swanson, Hoskyn, & Lee, 1999). Appropriate **assistive technology**—electronic devices and other equipment that can enhance students' abilities and performance—is also extremely valuable in helping students successfully participate in the curriculum and social life of general education classrooms.

Nondisabled students often benefit from inclusive practices as well. For example, they may be able to take advantage of special supports designed for students with disabilities—perhaps detailed study guides or supplementary explanations (C. M. Cole et al., 2004). Furthermore, they acquire an increasing awareness of the heterogeneous nature of the human race and discover that individuals with special needs are in many respects very much like themselves (P. Hunt & Goetz, 1997; D. Staub, 1998). One of us authors often thinks about her son Jeff's friendship with Evan, a classmate with severe physical and cognitive disabilities, during their third-grade year. A teacher had asked Jeff to be a special friend to Evan, interacting with him at lunch and whenever possible. Although largely unable to speak, Evan always made it clear through gestures and expressions that he was delighted to spend time with his friend, giving Jeff—who was quite shy—a boost in social self-confidence. Several years later Jeff reflected on this friendship:

It made me realize that Evan was a person too. It made me realize that I could have a friendship with a boy with disabilities. Doing things that made Evan happy made me happy as well. I knew that *Evan* knew that we were friends.

It's essential, of course, that nondisabled students treat classmates who have disabilities in respectful and supportive ways and, better still, forge friendships with these classmates. As teachers, we can do several things to nurture good relationships between students:

- 🍏 Explicitly point out the strengths of a student with a disability.
- 🍏 Ask students with and without disabilities to assist others in their areas of strength.
- 🍏 Plan academic and recreational activities that require cooperation.
- 🍏 Encourage students with disabilities to participate in extracurricular activities and community events. (Bassett et al., 1996; DuPaul, Ervin, Hook, & McGoey, 1998; Hamovitch, 2007; Madden & Slavin, 1983; Turnbull, Pereira, & Blue-Banning, 2000)

There are advantages and drawbacks to inclusion for classroom teachers as well. On the positive side, the inclusion of students with disabilities can lead to greater acceptance of individuals with disabilities among other students and increased opportunities for students to work in diverse groups and explain concepts to one another. Nevertheless, the inclusion of students with disabilities in regular classrooms does introduce some challenges for teachers. For example, teachers may need to differentiate instruction to a greater degree, prepare alternative materials for some students, and spend extra time with students with disabilities.

## IDENTIFYING STUDENTS' SPECIAL NEEDS: RESPONSE TO INTERVENTION AND PEOPLE-FIRST LANGUAGE

Experts don't completely agree about how to define various categories of special needs—especially those not involving obvious physical conditions—or about how best to identify students who fit into each category. In the United States, IDEA provides specific identification criteria for various disabilities. Students with disabilities who don't meet IDEA's criteria are often eligible for special educational services under Section 504 of the Rehabilitation Act of 1973 (sometimes referred to simply as *Section 504*). This act stipulates that institutions that benefit from federal funding (including public schools) can't discriminate against individuals on the basis of a disability.

Procedures for assessing and accommodating students' disabilities are less prescriptive in Section 504 than they are in IDEA—a situation that can be either advantageous or disadvantageous, depending on the circumstances.

One approach to identification that is gaining increasing support (and that is endorsed in the 2004 reauthorization of IDEA) involves determining **response to intervention (RTI)**. In this approach, a teacher keeps an eye out for any student who has exceptional difficulty with basic skills in a certain domain (e.g., in reading or math) despite normal whole-class instruction *and* intensive follow-up small-group instruction that have both been shown *by research* to be effective for most children. Such a student is referred for in-depth assessments of various characteristics and abilities. If the assessment rules out obvious disabling conditions (e.g., significant genetic abnormalities, sensory impairments), the student is assumed to have a cognitive impairment—often, but not always, falling within the category of learning disabilities—and is therefore eligible for special services (e.g., Fletcher & Vaughn, 2009; L. S. Fuchs & Fuchs, 2009; Mellard & Johnson, 2008).

Whenever we identify a student as having a particular disability, however, we run the risk of focusing other people's attention on weaknesses rather than on the student's many strengths and age-typical characteristics. To minimize such an effect, special educators urge us all to use **people-first language** when referring to students with disabilities—in other words, to mention the person *before* the disability. For instance, we might say *student with a learning disability* rather than *learning-disabled student* or *student who is blind* rather than *blind student*.

In upcoming sections of the chapter, we group students with special needs into five general categories. Table 5.2 lists the specific kinds of special needs that fall within each category. Disabilities covered by IDEA appear in red in the table.

#### MyEdLab Self-Check 5.3

**MyEdLab Application Exercise 5.3.** This interactive exercise allows you to practice identifying instructional adaptations tailored to the specific strengths and weaknesses of a student with special needs.



## Students with Specific Cognitive or Academic Difficulties

Some students with special educational needs show no outward signs of physical disability yet have cognitive difficulties that interfere with their ability to learn certain kinds of academic material or perform certain kinds of classroom tasks. Such students include those with learning disabilities, attention-deficit hyperactivity disorder, and speech and communication disorders.

### LEARNING DISABILITIES

Although there are varying definitions of learning disabilities, students with **learning disabilities** have significant difficulties in one or more specific cognitive processes that can't be attributed to cultural or linguistic diversity, generally delayed cognitive development, emotional problems, sensory impairment, or environmental deprivation. Such difficulties often appear to result from specific and possibly inherited brain dysfunctions (American Psychiatric Association, 2013; N. Gregg, 2009; K. Pugh & McCardle, 2009). Figure 5.3 lists several forms that a learning disability might take.

### COMMON CHARACTERISTICS

In general, students with learning disabilities are different from one another in many more ways than they are similar. They typically have many strengths but may also face challenges:

- Poor reading and writing skills
- Ineffective learning and memory strategies
- Trouble concentrating on and completing assigned tasks, especially in the face of distractions
- Poor sense of self and low motivation for academic tasks, especially in the absence of individualized assistance in areas of difficulty



Use people-first language when talking about students with disabilities.



#### MyEdLab Video Example 5.4.

In the general education classroom, teachers adapt instructional strategies to meet the learning needs of students with various difficulties and disabilities.

## STUDENTS IN INCLUSIVE SETTINGS

TABLE 5.2 • General and Specific Categories of Students with Special Needs (Specific Categories Listed in Red Are Covered by IDEA)

GENERAL CATEGORY	SPECIFIC CATEGORIES	DESCRIPTION
<b>Students with specific cognitive or academic difficulties:</b> These students exhibit an uneven pattern of academic performance; they may have unusual difficulty with certain kinds of tasks yet perform quite successfully on other tasks.	Learning disabilities	Difficulties in specific cognitive processes (e.g., in perception, language, or memory) that cannot be attributed to other disabilities, such as mental retardation, emotional or behavioral disorders, or sensory impairments
	Attention-deficit hyperactivity disorder (ADHD) (not specifically covered by IDEA, but students are often eligible for special services under the IDEA category Other Health Impairments)	Disorder marked by either or both of these characteristics: (1) difficulty focusing and maintaining attention and (2) frequent hyperactive and impulsive behavior
	Speech and communication disorders	Impairments in spoken language (e.g., mispronunciations of certain sounds, stuttering, or abnormal syntactical patterns) or in language comprehension that significantly interfere with classroom performance
<b>Students with social or behavioral problems:</b> These students exhibit social, emotional, or behavioral difficulties serious enough to interfere significantly with their academic performance.	Emotional and behavioral disorders	Emotional states and behaviors that are present over a substantial period of time and significantly disrupt academic learning and performance
	Autism spectrum disorders	Disorders marked by impaired social cognition, social skills, and social interaction, as well as repetition of certain idiosyncratic behaviors; milder forms (e.g., Asperger syndrome) associated with normal development in other domains; extreme forms associated with delayed cognitive and linguistic development and highly unusual behaviors
<b>Students with general delays in cognitive and social functioning:</b> These students exhibit low achievement in virtually all academic areas and have social skills typical of much younger children.	Intellectual disabilities (mental retardation)	Significantly below-average general intelligence and deficits in adaptive behavior (i.e., in practical and social intelligence); deficits are evident in childhood and typically appear at an early age.
<b>Students with physical or sensory challenges:</b> These students have disabilities caused by diagnosed physical or medical problems.	Physical and health impairments	Physical or medical conditions (usually long-term) that interfere with school performance as a result of limited energy and strength, reduced mental alertness, or little muscle control
	Visual impairments	Malfuncions of the eyes or optic nerves that prevent normal vision even with corrective lenses
	Hearing loss	Malfuncions of the ear or associated nerves that interfere with the perception of sounds within the frequency range of normal speech
<b>Students with advanced cognitive development:</b> These students have unusually high ability in one or more areas.	Giftedness (not covered by IDEA unless a disability is also present)	Unusually high ability or aptitude in one or more domains, usually within the academic curriculum, requiring special educational services to help students meet their full potential

- Poor motor skills
- Poor social skills (Estell et al., 2008; Gathercole, Lamont, & Alloway, 2006; N. Gregg, 2009; Job & Klassen, 2012; K. Pugh & McCardle, 2009; Swanson, in press; Waber, 2010)

By no means do such characteristics describe *all* students with learning disabilities. For instance, some are attentive in class, and some are socially skillful and popular with peers.

Sometimes learning disabilities reflect a mismatch between students' developing abilities, on the one hand, and grade-level expectations for performance, on the other (Waber, 2010). For instance, as students reach middle school, they're typically expected to work with little or no supervision, yet students with learning disabilities don't always have the time management skills they need to get things done (N. Gregg, 2009). In high school classes, learning may require

**FIGURE 5.3** Examples of cognitive processing deficiencies in students with learning disabilities.

**Perceptual difficulty.** Students may have trouble understanding or remembering information they receive through a particular modality, such as vision or hearing.

**Memory difficulty.** Students may have less capacity for remembering information over either the short or long run (i.e., they may have problems with either *working memory* or *long-term memory*).

**Metacognitive difficulty.** Students may have difficulty using effective learning strategies, monitoring progress toward learning goals, and in other ways directing their own learning.

**Oral language processing difficulty.** Students may have trouble understanding spoken language or remembering what they have been told.

**Reading difficulty.** Students may have trouble recognizing printed words or comprehending what they read; extreme form is known as *dyslexia*.

**Written language difficulty.** Students may have problems in handwriting, spelling, or expressing themselves coherently on paper; an extreme form is known as *dysgraphia*.

**Mathematical difficulty.** Students may have trouble thinking about or remembering information involving numbers; an extreme form is known as *dyscalculia*.

**Social perception difficulty.** Students may have trouble interpreting others' social cues and signals and thus may respond inappropriately in social situations.

**Music processing difficulty.** Students may have little sensitivity to differences in pitch and be unable to recognize familiar tunes; an extreme form is known as *amusia*.

reading and studying sophisticated textbooks, yet the average high school student with a learning disability reads at a fourth- to fifth-grade level and has few, if any, effective study strategies (Cutting, Eason, Young, & Alberstadt, 2009; Meltzer & Krishnan, 2007).

The following exercise can give you a sense of how these students might feel under such circumstances.

## EXPERIENCING FIRSTHAND

### A READING ASSIGNMENT

Read the following passage carefully. You'll be tested on its contents later in the chapter.

Personality research needs to refocus on global traits because such traits are an important part of everyday social discourse, because they embody a good deal of folk wisdom and common sense, because understanding and evaluating trait judgments can provide an important route toward the improvement of social judgment, and because global traits offer legitimate, if necessarily incomplete, explanations of behavior. A substantial body of evidence supporting the existence of global traits includes personality correlates of behavior, interjudge agreement in personality ratings, and the longitudinal stability of personality over time. Future research should clarify the origins of global traits, the dynamic mechanisms through which they influence behavior, and the behavioral cues through which they can most accurately be judged. (Funder, 1991, p. 31)

How well do you think you will perform on the upcoming test about this passage?

The passage you just read is a fairly typical one from *Psychological Science*, a professional journal written for people with advanced education (e.g., doctoral degrees) in psychology. Hence, it was written well above a typical college student's reading level. We won't *really* test you on the passage's contents, but we authors hope that the exercise gave you a feel for the frustration that high school students with learning disabilities might experience. For many students with learning disabilities, completing school assignments may constantly seem like fighting an uphill battle. Perhaps for this reason, a higher-than-average percentage of students with learning disabilities drop out of school before graduation (N. Gregg, 2009).

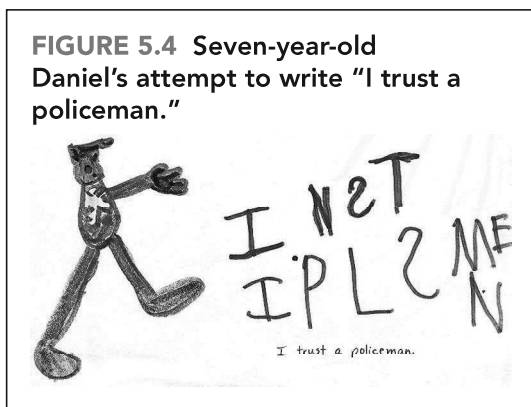
## ADAPTING INSTRUCTION

Instructional strategies for students with learning disabilities must be tailored to students' specific strengths and weaknesses. If you become a regular classroom teacher, you will quite likely partner with a special educator when you have students with learning disabilities in your classes. You and the special educator will work collaboratively to adapt your instruction at times. Several strategies should benefit many of these students:

- 🍏 *Minimize distractions.* Because many students with learning disabilities are easily distracted, we should minimize the presence of other stimuli that might compete for their attention—for example, by pulling down window shades if other classes are playing outside and by asking students to clear away materials they don't immediately need (Buchoff, 1990).
- 🍏 *Present new information in an explicit and well-organized manner.* Most students with learning disabilities learn more successfully when instruction directly communicates what they need to learn, rather than requiring them to draw inferences and synthesize ideas on their own. Frequent and carefully structured practice of important skills is also critical (Fletcher, Lyon, Fuchs, & Barnes, 2007; J. A. Stein & Krishnan, 2007; U.S. Department of Education, 2014).
- 🍏 *Present information in multiple sensory modalities.* Because some students with learning disabilities have trouble learning through a particular sensory modality, we need to think broadly about the modalities we use to communicate information. Thus we might incorporate videos, graphics, and other visual materials, and we might encourage students to audiotape lectures. And, when teaching children to recognize letters, we might have them not only look at the letters but also trace large, textured letter shapes with their fingers (Florence, Gentaz, Pascale, & Sprenger-Charolles, 2004; J. A. Stein & Krishnan, 2007; J. W. Wood & Rosbe, 1985).
- 🍏 *Present stimulating, novel materials,* which may be particularly helpful in preventing students from getting bored and maintaining their attention while reading (Beike & Zentall, 2012).

For example, stories that have a surprising turn of events may be particularly beneficial for the engagement of students with learning disabilities during reading.

- 🍏 *Analyze students' errors for clues about processing difficulties.* As an example of this strategy, look at 7-year-old Daniel's attempt to write "I trust a policeman" in Figure 5.4. Daniel captured several sounds correctly, including the "s" and final "t" sounds in *trust* and all of the consonant sounds in *policeman*. However, he misrepresented the first two consonant sounds in *trust*, replacing the *t* and *r* with an *N*. He also neglected to represent most of the vowel sounds, and two of the three vowels he did include (*I* for the article *a* and the *E* near the end of *policeman*) are incorrect. We might suspect that Daniel has difficulty hearing all the distinct sounds in spoken words and matching them with the letters he sees in written words. Such difficulties are quite common in students with significant reading disabilities (Goswami, 2007; N. Gregg, 2009; K. Pugh & McCardle, 2009).



Chapter 6 and Chapter 7 provide many strategies for helping students study and learn.

- 🍏 *Teach study skills and learning strategies.* Many students with learning disabilities benefit from being taught specific strategies for completing assignments and remembering subject matter (Joseph & Konrad, 2009; Meltzer, 2007; Wilder & Williams, 2001). For example, we might teach them strategies for taking notes and organizing homework, and we can teach them specific *mnemonics*, or memory tricks, to help them remember facts (see Figure 5.5).
- 🍏 *Provide paper or electronic scaffolding that can support students as they study and work.* We might develop study guides, outlines, or graphics that help students identify and interrelate important concepts and ideas. We could provide a copy of a high-achieving classmate's lecture notes. And we can teach students how to use the grammar and spell checkers in word processing software (N. Gregg, 2009; Mastropieri & Scruggs, 1992; Meltzer, 2007).

## ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Virtually all students are apt to be inattentive, hyperactive, and impulsive at one time or another. But those with **attention-deficit hyperactivity disorder (ADHD)** typically have significant and chronic deficits in these areas, as reflected in the following identification criteria:

- *Inattention.* Students may have considerable difficulty focusing and maintaining attention on assigned tasks, especially when appealing alternatives are close at hand. They may have trouble listening to and following directions, and they may often make careless mistakes.

- *Hyperactivity.* Students may seem to have an excess amount of energy. They're apt to be fidgety and may move around the classroom at inappropriate times.
- *Impulsivity.* Students almost invariably have trouble inhibiting inappropriate behaviors. They may blurt out answers, begin assignments prematurely, or engage in risky or destructive behaviors without thinking about potential consequences. (American Psychiatric Association, 2000; Barkley, 2006; Gatzke-Kopp & Beauchaine, 2007; N. Gregg, 2009)

Students with ADHD don't necessarily show all three of these characteristics. For instance, some are inattentive without also being hyperactive, as is true for Tim in the opening case study. But all students with ADHD appear to have one characteristic in common: an *inability to inhibit inappropriate thoughts, inappropriate actions, or both* (Barkley, 2006, 2010; B. J. Casey, 2001; Nigg, 2010). Tim, for example, is easily distracted by his thoughts and daydreams when he should be focusing on a classroom lesson.

The prevalence of ADHD in the United States may surprise you. First, boys are about twice as likely as are girls to be diagnosed with ADHD. In the United States approximately 6.4 million students are diagnosed with ADHD at some point in time. In addition, these diagnoses have increased by 53% over the past decade (National Center for Learning Disabilities, 2014). The increase in diagnoses is due to a number of factors, including greater awareness of ADHD and thus more frequent diagnoses.

In many instances, ADHD appears to be the result of brain abnormalities that limit students' ability to focus their attention and control their behaviors (e.g., Kadziela-Olech, Cichocki, Chwiesko, Konstantynowicz, & Braszko, 2015). Sometimes these abnormalities are inherited, but sometimes, instead, they're the result of toxic substances in children's early environments—perhaps high lead content in the paint dust of old buildings (Accardo, 2008; Barkley, 2010; Faranoe et al., 2005; Gatzke-Kopp & Beauchaine, 2007; Nigg, 2010).

### COMMON CHARACTERISTICS

In addition to inattentiveness, hyperactivity, and impulsivity, students identified as having ADHD may have characteristics such as these:

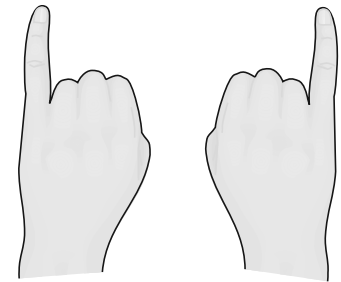
- Exceptional imagination and creativity; exceptionally detailed memories
- Certain specific cognitive processing difficulties (e.g., see Figure 5.6) and low school achievement
- Problems with planning and time management
- Classroom behavior problems (e.g., disruptiveness, noncompliance)
- Poor social skills and interpersonal difficulties
- Increased probability of substance abuse in adolescence (Barkley, 2006; Gatzke-Kopp & Beauchaine, 2007; S. Goldstein & Rider, 2006; N. Gregg, 2009; Hallowell, 1996; Skowronek, Leichtman, & Pillemer, 2008; Tarver, Daley, & Sayal, 2014)

Students' attention, hyperactivity, and impulsiveness problems may diminish somewhat in adolescence, but they don't entirely disappear, making it difficult for students to handle the increasing demands that come in high school; for many, ADHD continues into and sometimes throughout adulthood (Tarver, Daley, & Sayal, 2014). Accordingly, students with ADHD are at greater-than-average risk for dropping out of school (Barkley, 2006; S. Goldstein & Rider, 2006; N. Gregg, 2009; E. L. Hart, Lahey, Loeber, Applegate, & Frick, 1995). ADHD continues to be a life-long issue for some individuals (Tarver et al., 2014).

### ADAPTING INSTRUCTION

Some students with ADHD take medication that helps them control their symptoms. But medication alone is rarely sufficient to enable classroom success; individually tailored educational interventions are also in order (Purdie, Hattie, & Carroll, 2002). The strategies previously listed for students with learning disabilities can often be helpful

**FIGURE 5.5** A mnemonic for remembering the letters *b* and *d*.



Young children with learning disabilities often confuse lowercase *b* and *d*. By clenching their fists as shown here and "reading" their hands in the normal left-to-right direction, they can more easily remember the difference: *b* comes first in both the alphabet and the fists.

**FIGURE 5.6** Like many students with ADHD, 10-year-old Joshua has specific cognitive processing difficulties. Although he has the math skills of a typical fifth grader, he has delayed reading comprehension and writing skills, as reflected in the book report shown here. Josh can more easily express his thoughts orally.

I am just done with book. I really like this book that I chose and it was a good chose. She dose not go back to San Fransico and find her peo PaLs she stay io the Ardic. I would be saved too and cold. Mya X has survived there about done.

for students with ADHD. Researchers and practitioners have offered several additional suggestions:

- 🍏 *Modify students' work environments and schedules.* Students with ADHD do better in a work environment that features minimal distractions, some degree of structure, and ongoing teacher monitoring. And ideally, students should have most academic subjects and challenging tasks in the morning rather than in the afternoon, as the symptoms of ADHD tend to get progressively worse as the day goes on (Barkley, 2006; N. Gregg, 2009).
- 🍏 *Explicitly facilitate attention and concentration.* Students may benefit from soundproof headphones or “white noise” machines that block out potentially distracting sounds, or, for a low-tech alternative, we might encourage them to move to a new location if their current one presents too many distractions (Buchoff, 1990; N. Gregg, 2009). Also, some computer programs give students practice in focusing and keeping their attention on specific stimuli (e.g., Klingberg, Keonig, & Bilbe, 2002; Rueda, Rothbart, McCandliss, Saccomanno, & Posner, 2005). Even using colored highlighting to point out particularly relevant information in reading materials or math problems may improve performance (Kercood, Zentall, Vinh, & Tom-Wright, 2012).
- 🍏 *Provide outlets for excess energy.* To help students control excess energy, we should intersperse quiet academic work with frequent opportunities for exercise (Pellegrini & Bohn, 2005; Pfiffner, Barkley, & DuPaul, 2006). We might also give students a settling-in time after recess or lunch—perhaps reading an excerpt from a high-interest book or article—before asking them to engage in an activity that involves quiet concentration (Pellegrini & Horvat, 1995).
- 🍏 *Help students organize and use their time effectively.* For example, we can show them how to prioritize activities, create to-do lists, and establish a daily routine that they post on their desks. We can break large tasks into smaller ones and set a short time limit for each subtask. And we can provide a folder in which students transport homework assignments to and from school (Buchoff, 1990; N. Gregg, 2009; Pfiffner et al., 2006).

## SPEECH AND COMMUNICATION DISORDERS

Specific language impairments are described in Chapter 2.

**Speech and communication disorders** are impairments in spoken language or language comprehension that significantly interfere with students' academic performance. Examples include persistent articulation problems (e.g., see Figure 5.7), stuttering, abnormal syntactical patterns, and difficulty understanding other people's speech. By the time children reach the first grade, about 5% have noticeable speech disorders (National Institute of Deafness and Other Communication Disorders, 2010). Sometimes, but not always, these children have difficulty perceiving and mentally processing particular aspects of spoken language—a subcategory of speech and communication disorders known as *specific language impairments*. And often—but again, not always—the source of the disorder can be traced to heredity or brain abnormalities (Bishop, 2006; J. L. Locke, 1993; Spinath, Price, Dale, & Plomin, 2004).

### COMMON CHARACTERISTICS

Although some students with speech and communication disorders have other disabilities as well, many of them are in most ways just typical students. Nevertheless, the following characteristics are fairly common:

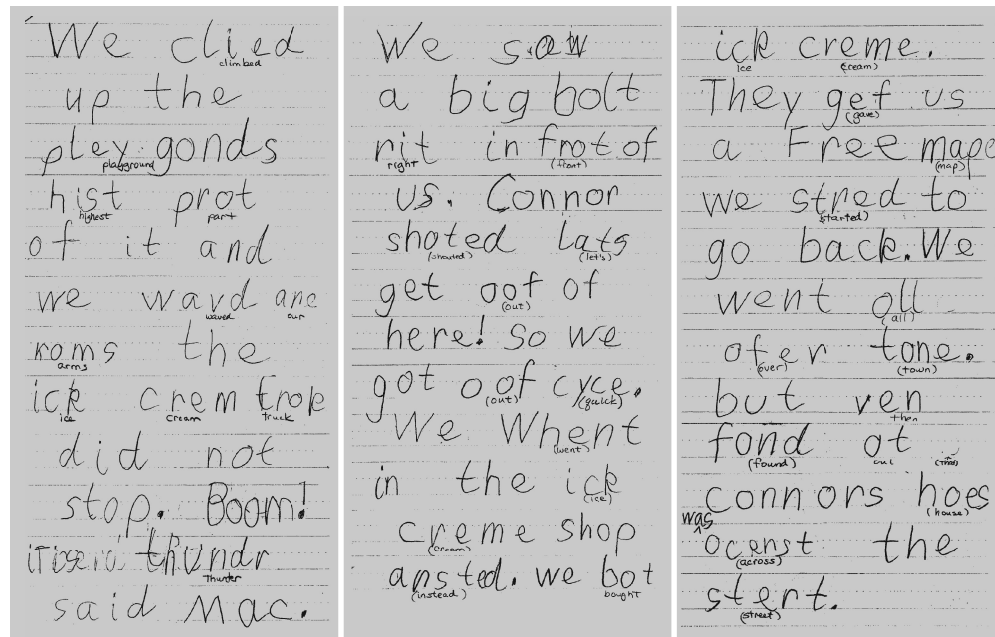
- Reluctance to speak; embarrassment and self-consciousness when speaking
- Difficulties in reading and writing (Fey, Catts, & Larrivee, 1995; Heward, 2009; LaBlance, Steckol, & Smith, 1994; Rice, Hadley, & Alexander, 1993)

### ADAPTING INSTRUCTION

Usually a trained specialist will work with students to help them improve or overcome their speech and communication difficulties. Although students may display deficits in only one noticeable part of speech, the specialist quite likely will intervene and work on a variety of aspects of speech (Owens, Farinella, & Metz, 2015). Nevertheless, general education teachers can assist in several ways:



**FIGURE 5.7** Seven-year-old Isaac receives speech therapy at school to address his consistent mispronunciation of certain sounds (such as pronouncing “th” as “v”). In his writing, he sometimes spells words as he says them rather than as he hears them (for instance, he writes *ven* for *then*).



- 🍏 *Encourage regular oral communication.* Students with speech and communication disorders need as much practice in classroom-based public speaking as their classmates do. Thus, we should encourage them to talk in class, provided that doing so doesn't create exceptional stress (Hallahan, Kauffman, & Pullen, 2009; Patton, Blackburn, & Fad, 1996). We also should provide models of sentences and phrases that are easy for the child to understand, but also grammatically correct (Owens et al., 2015).
- 🍏 *Listen patiently.* When students have trouble expressing themselves, we might be tempted to assist them, perhaps by finishing their sentences for them. But we help them more when we allow them to complete their own thoughts, and we must encourage their classmates to be equally patient (Heward, 2009; Patton et al., 1996). One of the authors of this book had a friend during adolescence who stuttered. In order to help the student, friends often would complete sentences for him when he was struggling to articulate a thought; however, when it was pointed out that it would be more helpful to listen patiently and allow the friend to complete his sentence for himself, conversations with the friend got much easier.
- 🍏 *Ask for clarification when a message is unclear.* If we haven't entirely understood what students are saying, we should explain what we *did* understand and ask for clarification of the rest. Honest feedback helps students learn how well they're communicating (Patton et al., 1996).
- 🍏 *Use augmentative and alternative communication (AAC) when students have little or no oral language.* Some forms of AAC involve computer technology; for example, a laptop or computer tablet might have a touchscreen that "speaks" when a student puts a finger on particular words or symbols. Others are nonelectronic; for example, we might give students a set of pictures or teach them some gestures they can use to represent their thoughts (Beukelman & Mirenda, 2005). For those of us who don't have easy access to speech experts, assessments and interventions can be provided via the Internet (Waite, Theodoros, Russell, & Cahill, 2010, 2012).

## GENERAL RECOMMENDATIONS

In addition to the strategies described in the preceding pages, several general ones apply to many students with specific cognitive or academic difficulties:

- 🍏 *Get an early start on appropriate interventions.* When students lack basic concepts and skills on which their future learning will depend, intensive instruction to fill in the gaps—and the earlier, the better—can often make a significant difference in their achievement over the long run (L. S. Fuchs et al., 2005; Waber, 2010; Wanzek & Vaughn, 2007).
- 🍏 *Take skill levels into account when assigning reading materials.* Even after intensive reading instruction, many students with specific cognitive or academic difficulties continue to have poor reading skills. Thus, we may sometimes need to identify alternatives to standard grade-level textbooks for presenting academic content. For example, we might reduce the amount of required reading, substitute materials written on a simpler (yet not babyish) level, or present information through some medium other than printed text—perhaps audiotapes or text-to-speech computer software (N. Gregg, 2009; Mastropieri & Scruggs, 2007). Students may also need extra guidance and support when assignments require them to find and read information on the Internet (Sampson, Szabo, Falk-Ross, Foote, & Linder, 2007).
- 🍏 *Clearly describe expectations for academic performance.* Students will have an easier time accomplishing classroom tasks if they're told, in concrete and precise terms, exactly what's expected of them (Meltzer & Krishnan, 2007). For example, before students begin a science lab activity, we might first remind them to carefully follow the steps described on the lab sheet, then review safety precautions, and finally provide a written list of components that should be included in lab reports.
- 🍏 *Take steps to enhance self-confidence and motivation.* Students with a long history of failure at academic tasks need to see that they're making progress and that they do some things quite well. For instance, we can give them daily or weekly goals we know they can attain. We can also have them keep journals in which they describe the successes they've achieved each day. And, of course, we should give them opportunities to do tasks at which they excel (Buchoff, 1990; J. A. Stein & Krishnan, 2007).

**MyEdLab Application Exercise 5.4.** This interactive exercise gives you the opportunity to practice applying instructional adaptations and classroom practices that meet unique needs of students with specific cognitive or academic difficulties.



## Students with Social or Behavioral Problems

For more information about matching instructional strategies to students' temperaments, see the section on *goodness of fit* in Chapter 3.

Many students have minor social, emotional, or behavioral difficulties at one time or another, particularly during times of unusual stress or major life changes. Often these problems are temporary ones that require only a little extra support from caring adults and peers. At other times problems are more enduring but *don't* reflect a disability. Perhaps a student's temperament is a poor fit with a teacher's instructional strategies—for instance, an especially fidgety child may perform poorly on lengthy seatwork assignments—or perhaps a teacher simply hasn't made clear the expectations and rules for classroom behavior (Keogh, 2003; Mehan, 1979). In such situations students' problems may decrease or disappear with a change in instructional practices or classroom management strategies.

However, some students show a pattern of engaging in behaviors that consistently interfere with their learning and performance *regardless* of the teacher and the classroom environment. In this section we'll look at two groups of students who fit into this category: those with emotional and behavioral disorders and those with autism spectrum disorders.

## EMOTIONAL AND BEHAVIORAL DISORDERS

Students with **emotional and behavioral disorders** become identified as students with special needs—and therefore qualify for special educational services—when their problems have a

substantial negative impact on classroom learning. Nevertheless, in the United States, some students do not receive adequate services; although these students represent between 3% and 6% of the population of students, less than 1% receive special education services under this categorization (Lane, Menzies, Kalberg, & Oakes, 2012). Symptoms of emotional and behavioral disorders typically fall into one of two broad categories. **Externalizing behaviors** have direct or indirect effects on other people; examples include aggression, defiance, stealing, and general lack of self-control. **Internalizing behaviors** primarily affect the student with the disorder; examples include severe anxiety or depression, exaggerated mood swings, withdrawal from social interaction, and eating disorders. Students with externalizing behaviors—who are more likely to be boys than girls—are more likely to be referred for evaluation and possible special services. However, students with internalizing behaviors—who are more likely to be girls than boys—can be just as much at risk for school failure (Angold, Worthman, & Costello, 2003; Gay, 2006; Hayward, 2003). These disorders need to be taken seriously, because, in addition to school failure, students with externalizing and internalizing behaviors are more at risk for serious mental health issues, including thinking about or attempting suicide (Peter & Roberts, 2010).

Some emotional and behavioral disorders result from environmental factors, such as stressful living conditions, child maltreatment, or family alcohol or drug abuse (P. T. Davies & Woitach, 2008; D. Glaser, 2000; Maughan & Cicchetti, 2002). But biological causes (e.g., inherited predispositions, chemical imbalances, brain injuries) may also be involved, either by themselves or through interaction with environmental conditions (Dodge, 2009; Raine, 2008; Yeo, Gangestad, & Thoma, 2007). Some students with a genetic predisposition for an emotional or behavioral disorder exhibit few, if any, signs until adolescence, as the following case illustrates:

As a ninth grader, Kirk was a well-behaved, likeable student who earned As and Bs and showed particular promise in science and math. But in 10th grade, his grades began to decline, and he increasingly exhibited hostile and defiant behaviors. When Kirk failed three classes during the fall of his 12th-grade year, the school principal convened a meeting with him, his parents, and his faculty advisor to discuss how to help Kirk get back on track. At the meeting the principal described several occasions on which Kirk had acted disoriented, belligerent, and seemingly “high” on drugs. Despite his strong desire to attend college the following year, Kirk sat at the meeting smirking (seemingly gleeful about his predicament) and focusing his attention on sorting pieces of trail mix in a bowl on the conference room table. By the end of the meeting, the principal was so infuriated that she expelled him from school.

Over the next few weeks, Kirk’s mental condition and behavior continued to deteriorate, to the point that he was soon arrested, placed in a juvenile detention facility, and eventually hospitalized in the state mental institution.

Kirk was ultimately diagnosed with *bipolar disorder*, a condition that is usually inherited and is characterized by excessive mood swings (hence, the disorder is sometimes called manic depression) and in some cases (like Kirk’s) by distorted thought processes. Bipolar disorder often doesn’t appear until adolescence, even though its biological underpinnings have been present since birth (Griswold & Pessar, 2000).

When students have emotional or behavioral disorders, their inappropriate behaviors interfere not only with academic achievement but also with peer relationships, leading to social as well as academic failure. Some of these students may seek the companionship of the few peers who will accept them—peers who typically behave in similarly inappropriate ways and may introduce one another to drugs, alcohol, or criminal activity (J. Snyder et al., 2008; Webber & Plotts, 2008). Sadly, many youth who have emotional or behavioral disorders do not receive the services and supports that they need. Often boys with externalizing behaviors receive support, but others sometimes do not receive sufficient services (Hallahan, Kauffman, & Pullen, 2015).

## COMMON CHARACTERISTICS

Students with emotional and behavioral disorders differ considerably in their abilities and personalities. However, in addition to the difficulty in maintaining healthy peer relationships just mentioned, you may observe one or more of the following characteristics:

- Frequent absences from school
- Deteriorating academic performance with increasing age



MyEdLab

### Video Example 5.5.

Some students consistently disrupt the classroom environment with inappropriate behavior and have difficulty forming and maintaining peer relationships. Teachers can take steps to help these students learn appropriate behaviors and give them a sense that they have some control over their circumstances.



Report suspicions about child maltreatment *immediately* to school administrators or child protective services.

- Often, but not always, below-average intelligence
- Low self-esteem
- Aggressive or withdrawn behaviors
- Little or no empathy for others' distress
- Significant substance abuse (Grinberg & McLean-Heywood, 1999; Harter, 1999; Kauffman & Landrum, 2013; Leiter & Johnsen, 1997; McGlynn, 1998; Richards, Symons, Greene, & Szuskiewicz, 1995; Turnbull, Turnbull, & Wehmeyer, 2010; Webber & Plotts, 2008)

Some students with emotional and behavioral disorders have other special needs as well, including learning disabilities, ADHD, or giftedness (Fessler, Rosenberg, & Rosenberg, 1991; Gatzke-Kopp & Beauchaine, 2007; Webber & Plotts, 2008).

### ADAPTING INSTRUCTION

There is promising research indicating that some specific drug treatments are quite helpful to some children and adolescents with emotional and behavioral disorders (Konopasek & Forness, 2014); however, environmental supports are also important. Effective interventions must be tailored to each student's unique needs, but several strategies can benefit many of these students:

- 🍏 *Show an interest in students' well-being and personal growth.* A good first step in helping students with emotional and behavioral disorders is simply showing that we care about them (Chang & Davis, 2009; Clarke et al., 1995; Heward, 2009). For example, we can greet them warmly when we see them, express concern when they seem upset or overly stressed, and lend a supportive ear when they want to share their opinions or frustrations. And we can take students' personal interests into account when planning instruction and assignments.
- 🍏 *Give students a sense that they have some control over their circumstances.* Some students, especially those who are frequently defiant, often respond to efforts to control them by behaving even *less* appropriately. With such students it's important to avoid power struggles in which only one person wins and the other inevitably loses. Instead, we must create situations in which we ensure that students conform to classroom expectations yet feel that they have some control over what happens to them. For example, we can teach them techniques for observing and monitoring their own actions, with the goal of developing more productive classroom behavior. We can also give them choices, within reasonable limits, about what tasks to accomplish in particular situations (Chang & Davis, 2009; Kern, Dunlap, Childs, & Clark, 1994; Lane, Falk, & Wehby, 2006).
- 🍏 *Make sure that students are learning basic skills.* Students with emotional and behavioral disorders often are inattentive and off-task, and thus less engaged with their academic work. Thus, these students may not develop some basic skills (e.g., basic reading or mathematical skills) that are important for all future learning. It is important to identify these disorders early, and to work collaboratively with special educators to meet these students' social and academic needs (Nelson, Benner, & Bohaty, 2014).
- 🍏 *Be alert for signs that a student may be contemplating suicide.* In the United States, suicide is the third-leading cause of death for adolescents; occasionally even younger students take their own lives (Goldston et al., 2008; Westefeld et al., 2010). Warning signs include the following:
  - Sudden withdrawal from social relationships
  - Increasing disregard for personal appearance
  - Dramatic personality change (e.g., sudden elevation in mood)
  - Preoccupation with death and morbid themes
  - Overt or veiled threats (e.g., "I won't be around much longer")
  - Actions that indicate putting one's affairs in order (e.g., giving away prized possessions) (Granello & Granello, 2006; Wiles & Bondi, 2001)

As teachers, we must take any of these warning signs seriously and seek help *immediately* from trained professionals, such as school psychologists or counselors.

It's also essential, of course, that we help students with emotional and behavioral disorders acquire more appropriate behaviors. We describe strategies for doing so after the discussion of autism spectrum disorders in the next section.

## AUTISM SPECTRUM DISORDERS

The central, defining features of **autism spectrum disorders** are marked impairments in social cognition (e.g., perspective taking, interpreting other people's body language), social skills, language usage, and social interaction. Many students with these disorders prefer to be alone and form weak, if any, emotional attachments to other people. Some students develop limited abilities to use language, whereas others' language usage is more fully developed. Common, too, are repetitive behaviors (often very odd ones rarely seen in age-mates) and inflexible adherence to certain routines or rituals (American Psychiatric Association, 2000; Lord, 2010; Pelphrey & Carter, 2007; Tager-Flusberg, 2007). Autism spectrum disorders are prevalent; in the United States, an estimated 1 out of every 68 children has been identified as having autism spectrum disorder, with five times as many diagnoses in boys as in girls (Centers for Disease Control, 2014).

Aside from similarities in social impairments and repetitive behaviors, individuals with autism spectrum disorders differ considerably in the severity of their condition—hence the term *spectrum*. In **Asperger syndrome**, a fairly mild form, students usually have normal language skills and average or above-average intelligence. In severe cases, which are often referred to simply as *autism*, children have major delays in cognitive development and language and may exhibit certain bizarre behaviors—perhaps constantly rocking or waving fingers, continually repeating what someone else has said, or showing unusual fascination with a very narrow category of objects (American Psychiatric Association, 2000; Lord, 2010).

The vast majority of autism spectrum disorders are probably caused by abnormalities in the brain. Some researchers have observed abnormalities in *mirror neurons*—neurons that probably underlie people's perspective-taking abilities (Gallese, Gernsbacher, Heyes, Hickok, & Iacoboni, 2011). Other researchers have discovered abnormalities in interconnections among various parts of the brain—for example, in connections between parts that enable logical reasoning or inhibition of impulses, on the one hand, and parts that underlie emotions and emotional processing, on the other (Cherkassky, Kana, Keller, & Just, 2006; I. L. Cohen, 2007; Kana, Keller, Minshew, & Just, 2007). Recent studies suggest that multiple regions of the brain are involved in autism spectrum disorders (Byrnes, 2012). Although some have speculated that autism may be caused by childhood vaccines, there is *no* evidence that there is any association of vaccines with autism (Institute of Medicine, 2011; Maglione et al., 2014). Also, students with autism spectrum disorders may be either undersensitive or oversensitive to environmental stimulation (Ratey, 2001; R. C. Sullivan, 1994; D. Williams, 1996). Temple Grandin, a woman who has gained international prominence as a designer of livestock facilities, recalls what it was like to be a child with autism:

From as far back as I can remember, I always hated to be hugged. I wanted to experience the good feeling of being hugged, but it was just too overwhelming. It was like a great, all-engulfing tidal wave of stimulation, and I reacted like a wild animal. . . . When I was little, loud noises were also a problem, often feeling like a dentist's drill hitting a nerve. They actually caused pain. I was scared to death of balloons popping, because the sound was like an explosion in my ear. (Grandin, 1995, pp. 63, 67)

## COMMON CHARACTERISTICS

In addition to the traits already described, students with autism spectrum disorders may have characteristics such as these:

- Strong visual–spatial thinking skills and exceptional awareness of visual details
- Unusual ability to maintain attention and focus during distractions
- Good memory for a set of unrelated facts
- Difficulty planning and organizing a future course of action
- Strong need for a consistent, predictable environment (I. L. Cohen, 2007; M. Dawson, Soulières, Gernsbacher, & Motttron, 2007; Gernsbacher, Stevenson, Khandakar, & Goldsmith,

Mirror neurons are described in more detail in Chapter 3.

2008; Grandin & Johnson, 2005; Lord, 2010; Meltzer, 2007; Pelphrey & Carter, 2007; Tager-Flusberg, 2007)

Occasionally students with autism exhibit *savant syndrome*, possessing an extraordinary ability (e.g., exceptional mathematical, artistic, or musical talent) that is quite remarkable in contrast to other aspects of their mental functioning (I. L. Cohen, 2007; L. K. Miller, 2005; Treffert & Wallace, 2002).

### ADAPTING INSTRUCTION

Children with Asperger syndrome are typically in general education classes. Students with autism spectrum disorders also can sometimes participate in general education classes for all or part of the day, although inclusion of these students can be complex, so the support of a special educator often may be necessary (Crosland & Dunlap, 2012). As with other exceptionalities, it is important to include parents in discussions about the most appropriate setting for their children. The mother of a first grader with autism, who advocated for her son to be in a classroom that also had non-special-education students, noted that “If he was in a program that was just with other autistic children, there would be no way for him to pick up the behaviors of typically developing children” (Crane, 2010).

Many of the classroom strategies described in earlier sections are applicable for such students. Two additional strategies are helpful as well:

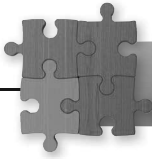
- 🍏 *Maximize consistency in the classroom layout and weekly schedule.* Many students with autism spectrum disorders feel more comfortable when their environments and schedules are predictable. At the beginning of the school year, then, we should arrange furniture and equipment in ways that will be serviceable throughout the school year, making adjustments later only if absolutely necessary. And to the greatest extent possible, we should schedule recurring activities at the same times each day or on particular days of the week. If the schedule must change for some reason, we should alert students well in advance (Dalrymple, 1995).
- 🍏 *Use visual approaches to instruction.* Because students with autism spectrum disorders often have strong visual-spatial skills but may have impaired language skills, a heavy emphasis on visual materials may be in order (Ozonoff & Schetter, 2007; C. C. Peterson, 2002; Quill, 1995). We might use objects, pictures, and photographs to convey ideas about academic topics, or we might use some sort of visual cue to signal the start of a new activity.

### GENERAL RECOMMENDATIONS

Although the causes of emotional and behavioral disorders and those of autism spectrum disorders are usually quite different, students with these disabilities can benefit from some of the same classroom interventions. Certainly we want to promote success on academic tasks, perhaps by using instructional strategies presented earlier for students with specific cognitive or academic difficulties. Following are additional suggestions:

- 🍏 *Insist on appropriate classroom behavior.* Although certain students with disabilities may be more prone to counterproductive classroom behaviors than most of their peers, teachers clearly *can* help them behave in productive ways—for instance, by putting reasonable limits on their behavior and imposing consequences when they go beyond those limits (Evertson & Weinstein, 2006; Webber & Plotts, 2008). The *Creating a Productive Classroom Environment* feature “Encouraging Appropriate Behavior in Students with Social or Behavioral Problems” offers several useful strategies.
- 🍏 *Foster social cognition and effective interpersonal skills.* Students with social or behavioral problems often benefit from training in social cognition and perspective taking. Explicit instruction in and reinforcement of social skills can also be quite powerful. And of course, students need numerous opportunities to *practice* their new skills (e.g., Chan & O’Reilly, 2008; Myles & Simpson, 2001; Nikopoulos & Keenan, 2004; Schrandt, Townsend, & Poulson, 2009; Theimann & Goldstein, 2004).
- 🍏 *Be persistent, and look for gradual improvement rather than overnight success.* Many students with social or behavioral problems will initially resist our efforts to help them. They may begin to recognize the value of our guidance and support only when they see the natural

You can find strategies for fostering social cognition and perspective taking in Chapter 3.



## Creating a Productive Classroom Environment

### Encouraging Appropriate Behavior in Students with Social or Behavioral Problems

🍏 **Make expectations for behavior clear and specific.**

A teacher reminds a student, "You can't borrow Mary's bottle of glue without getting her permission. Check with Mary first to make sure it's all right for you to use her things. If Mary says no, ask someone else."

🍏 **Specify and follow through on consequences for appropriate and inappropriate behaviors.**

A teacher tells a student, "Sam, you know that certain four-letter words, such as the two you just used, are unacceptable in this classroom. You also know the consequence for such behavior, so please go to the time-out corner for 10 minutes."

🍏 **Give feedback about specific behaviors rather than general areas of performance.**

A teacher tells a student, "You did a good job in study hall today. You focused your attention on your homework, and you didn't retaliate when Jerome accidentally brushed past you on his way to my desk."

🍏 **Try to anticipate problems and nip them in the bud.**

A student has occasional temper tantrums that disrupt the entire class. Although the tantrums seemingly occur at random, his teacher eventually realizes that his ears always turn red just before an outburst. With this knowledge, she can divert the student's attention to a punching bag whenever a tantrum is imminent, thereby letting him unleash his feelings with only minimal distraction to others.

Sources: Hallahan et al., 2009; Heward, 2009; Myles & Simpson, 2001; Ormrod & McGuire, 2007 (temper tantrum example); Webber & Plotts, 2008.

consequences of their changing behavior—for example, when they start to make new friends or get along better with their teachers. Their progress may be slow, but by focusing on small improvements, we and our students alike can be encouraged by the changes we *do* see, rather than being discouraged by problems that persist.

## Students with General Delays in Cognitive and Social Functioning

When we use the term *student with general delays in cognitive and social functioning*, we're talking about any student who shows a consistent pattern of developmental delays, regardless of whether the student has been identified as having a disability. Educators sometimes use the term *slow learner* to describe a student who obtains intelligence test scores in the 70s and has noticeable difficulties in most or all parts of the curriculum. A student with especially pronounced difficulties may be identified as having an intellectual disability.

### INTELLECTUAL DISABILITIES

You're undoubtedly familiar with the term *mental retardation*. In recent years, however, many special educators have instead advocated for the term **intellectual disability** in reference to students who show pronounced delays in most aspects of cognitive and social development. More specifically, students with intellectual disabilities exhibit *both* of the following characteristics (Luckasson et al., 2002):

- *Significantly below-average general intelligence.* These students have intelligence test scores that are quite low—usually no higher than 70, reflecting performance in the bottom 2% of their age-group. In addition, these students learn slowly and show consistently poor achievement in virtually all academic subject areas.
- *Deficits in adaptive behavior.* These students behave in ways that we would expect of much younger children. Their deficits in **adaptive behavior** include limitations in *practical intelligence*—that is, managing the ordinary activities of daily living—and *social intelligence*—that is, conducting themselves appropriately in social situations.

The preceding characteristics must be evident in childhood. Thus, a person who shows them beginning at age 18, perhaps as the result of a serious head injury, would *not* be classified as having an intellectual disability.





MyEdLab  
Video Example 5.6.

Students with intellectual disabilities experience difficulties in most or all parts of the curriculum and exhibit deficits in adaptive behavior. Many of these students are sociable and eager to fit in at school.



MyEdLab  
Video Example 5.7.

Students with physical or sensory challenges vary in their strengths and limitations. In the general education classroom, teachers build on student strengths and adapt the environment to minimize limitations.

Intellectual disabilities are often caused by genetic conditions. For example, most children with Down syndrome have delayed cognitive and social development. Other cases are due to biological but noninherited causes, such as severe malnutrition or excessive alcohol consumption during the mother's pregnancy or oxygen deprivation during birth. In other situations, environmental factors, such as parental neglect or an extremely impoverished and unstimulating home environment may be at fault (Beirne-Smith, Patton, & Kim, 2006).

### COMMON CHARACTERISTICS

Like students in any category of special needs, students with intellectual disabilities have differing personalities, strengths, and needs. Nevertheless, many of them are apt to exhibit characteristics such as the following:

- Sociability and a genuine desire to belong and fit in at school
- Less general knowledge about the world
- Poor reading and language skills
- Short attention span
- Poor memory; few or no effective learning and memory strategies
- Difficulty drawing inferences and understanding abstract ideas
- Difficulty generalizing something learned in one situation to a new situation
- Immature play behaviors and interpersonal skills
- Delayed motor skills; conditions that adversely affect performance in physical activities (e.g., heart defects, poor muscle tone) (Beirne-Smith et al., 2006; Bergeron & Floyd, 2006; Carlin et al., 2003; Heward, 2009; F. P. Hughes, 1998; Tager-Flusberg & Skwerer, 2007)

### ADAPTING INSTRUCTION

With proper support, many students with mild intellectual disabilities can learn basic skills in reading, writing, and math, perhaps even mastering components of a typical fifth- or sixth-grade curriculum (Hallahan et al., 2009; Heward, 2009). Many special programs also are available for students with mild intellectual disabilities, sometimes involving partnerships with local universities (Nepkin, 2014). Most of the strategies previously described in this chapter can be useful for these students. Here are several additional strategies to keep in mind:

- 🍏 *Pace instruction slowly and set short-term goals to ensure success.* When working with a student who has an intellectual disability, we should move through new topics and tasks slowly enough—and with enough support and repetition—that the student can eventually master them. Students with intellectual disabilities typically have a long history of failure at academic tasks. Thus, they need frequent success experiences to learn that, with hard work, they *can* succeed at many tasks. By setting short-term, easy-to-reach goals, students will be more likely to experience success, and be motivated to continue to engage in similar activities (Feuerstein et al., 2010; Fidler, Hepburn, Mankin, & Rogers, 2005; Heward, 2009; Sands & Wehmeyer, 2005).
- 🍏 *Provide considerable scaffolding to promote effective cognitive processes and desired behaviors.* We can develop simple study guides that tell students exactly what to focus on as they study. We can be explicit in our directions to perform various tasks—for instance, saying “John, go to the office, give Mrs. Smith the absentee sheet, and come back here.” And we can provide handheld, teacher-programmed prompters—which go by such labels as *visual assistant* and *digital memory aid*—to help students remember the things they need to do (Beirne-Smith et al., 2006; Mastropieri & Scruggs, 1992; Patton et al., 1996, p. 105; Turnbull et al., 2010).
- 🍏 *Include vocational and general life skills in the curriculum.* For most students with intellectual disabilities, training in life and work skills is an important part of the high school curriculum. Such training is most likely to be effective when it takes place in realistic settings that closely resemble those in which students will find themselves once they leave school (Beirne-Smith et al., 2006; Turnbull et al., 2010). One successful program provides opportunities for adolescents to learn a variety of farming and farm-related skills. Participants are able to learn about planting, harvesting, and even the retail aspects of farming, including

opportunities to sell produce at the farm's store (Bacon, 2014). The students report that they enjoy these opportunities, and the acquisition of these skills often leads to future employment.

#### MyEdLab Application Exercise 5.5.

In this interactive exercise you can practice identifying teaching strategies that help students with behavioral problems to function effectively and learn in the general education classroom.



## Students with Physical or Sensory Challenges

Some students with special needs have obvious physical disabilities caused by medically detectable physiological conditions. These include physical and health impairments, visual impairments, and hearing loss. A small subset of them have **severe and multiple disabilities** that require significant adaptations and highly specialized services; such students are typically accompanied by child-specific teacher aides or other specialists when attending general education classrooms.

### PHYSICAL AND HEALTH IMPAIRMENTS

**Physical and health impairments** are general physical or medical conditions (usually long term) that interfere with school performance to such a degree that special instruction, curricular materials, equipment, or facilities are necessary. Students in this category may have limited energy and strength, reduced mental alertness, or little muscle control. Examples of conditions that might qualify students for special services are traumatic brain injury, spinal cord injury, cerebral palsy, epilepsy, cancer, and acquired immune deficiency syndrome (AIDS).

### COMMON CHARACTERISTICS

It's hard to generalize about students with physical and health impairments because their conditions are so very different from one another. Nevertheless, several common characteristics are noteworthy:

- Low stamina and a tendency to tire easily
- Varying degrees of intellectual functioning (many of these students have learning ability similar to that of nondisabled peers)
- Lower levels of academic achievement as a result of frequent school absences
- Fewer opportunities to experience and interact with the outside world in educationally important ways (e.g., less use of public transportation, fewer visits to museums and zoos)
- Possible low self-esteem, insecurity, social isolation from peers, or heavy dependence on adults, depending partly on how parents and others have responded to their impairments (Heward, 2009; Patton et al., 1996; J. W. Wood, 1998; Yeo & Sawyer, 2005)

### ADAPTING INSTRUCTION

Although we won't necessarily need to modify the academic curriculum for students with physical and health impairments, we will definitely want to make certain accommodations:

- 🍏 *Be sensitive to specific limitations, and accommodate them flexibly.* One student may require extra time with a writing assignment and perhaps should not be held to the same standards of neatness and legibility. Another may need to respond to test questions orally rather than on paper. Still another might tire easily and need to take frequent breaks.
- 🍏 *Know what to do in emergencies.* A student with acute asthma may have trouble breathing; a student with diabetes may go into insulin shock; a student with epilepsy may have a grand mal seizure; a student who is HIV positive might get a cut and bleed. We should consult with school medical personnel ahead of time so that we are prepared to respond calmly and appropriately in such life- and health-threatening situations.

🍏 *If students and parents give permission, educate classmates about the nature of students' disabilities.* Many children treat peers with physical disabilities kindly and respectfully, but some others do not. Sometimes peers are simply ignorant about the nature of a disability, and giving them accurate information can help them become more accepting and supportive (e.g., R. White & Cunningham, 1991).

## VISUAL IMPAIRMENTS

Students with **visual impairments** have malfunctions of their eyes or optic nerves that prevent normal vision even with corrective lenses. Some students are totally blind, others see only fuzzy patterns of light and dark, and still others have a restricted visual field (*tunnel vision*) that allows them to see just a very small area at a time. Visual impairments are caused by congenital abnormalities in or damage to either the eye or the visual pathway to the brain. Vision is essential to the development of many cognitive abilities, including reading from print, understanding spatial relationships, and comprehension of concepts (Smith, Polloway, Doughty, Patton, & Dowdy, 2016). When students have visual impairments, these abilities may be delayed, and that could affect learning in all academic subjects.

### COMMON CHARACTERISTICS

Students with visual impairments are apt to have many or all of these characteristics:

- Normal functioning of other senses (hearing, touch, etc.)
- General learning ability similar to that of nondisabled students, although visual memory and concept development may be delayed or impaired
- More limited vocabulary, expressive and receptive language, and general world knowledge, in part because of fewer opportunities to experience the outside world in educationally important ways (e.g., less exposure to maps, films, and other visual material)
- Delayed motor development; reduced capability to imitate others' behaviors
- Inability to observe other people's body language and other nonverbal cues, leading to occasional misunderstanding of others' messages and immature social behaviors
- Uncertainty and anxiety (especially in chaotic environments, such as the lunchroom or playground) as a result of having no visual knowledge of ongoing events
- In the primary grades, less knowledge about the conventions of written language (direction of print, punctuation, etc.) (M. Harris, 1992; Heward, 2009; Hobson, 2004; Patton et al., 1996; Smith et al., 2016; Tompkins & McGee, 1986; Turnbull et al., 2010; Tuttle & Tuttle, 1996)

### ADAPTING INSTRUCTION

Specialists typically give students training in Braille, orientation and mobility, and specially adapted computer technology. But general education teachers play important roles as well, as reflected in the following strategies:

- 🍏 *Orient students ahead of time to the physical layout of the classroom.* Students should have a chance to explore the classroom before other students arrive—ideally, before the first day of class. At that time we can help students locate important objects (e.g., wastebasket and pencil sharpener) and point out special sounds (e.g., the buzzing of a wall clock) to help students get their bearings (J. W. Wood, 1998). We also need to support students when furniture or objects in the classroom are moved to new locations during the school year. Computer-generated virtual environments can now be created and presented to individuals prior to their immersion in a new environment, and the use of such software can improve navigation skills (Connors, Chrastil, Sánchez, & Merabet, 2014).
- 🍏 *Use visual materials with sharp contrast.* Some students with partial sight can use visual materials with clearly distinguishable features, such as enlarged documents on computer screens and the large-print books available at most libraries. Students' eyes may tire quickly, however, so we should limit use of visual materials to short time periods (Heward, 2009; Patton et al., 1996).

- 🍏 *Depend heavily on other modalities.* Print-reading computer software and portable print-reading devices easily translate most printed text into spoken language. Many novels, school textbooks, and published curriculum materials are available in Braille, many other books are available in audio form (e.g., see [www.learningally.org](http://www.learningally.org)), and volunteers can sometimes be enlisted to convert still other written materials into Braille or audiotape. We can also conduct hands-on activities involving objects that students can feel and manipulate, and we can involve students in projects that involve oral presentations. For example, we might use plastic relief maps that portray mountains, valleys, and coastlines in three dimensions, perhaps embellishing them with pin pricks to indicate country borders and small dabs of nail polish to indicate major cities.
- 🍏 *Allow extra time for learning and performance.* Learning by hearing often takes more time than learning by seeing. When students *look* at something, they perceive a great deal of information at once and thus learn many commonplace relationships (e.g., between the sight of a cat and the sound it makes). When they must *listen* to it, however, they receive it sequentially—only one piece at a time—and often without obvious interconnections (Ferrell, 1996; Heward, 2009; M. B. Rowe, 1978).
- 🍏 *Teach learning strategies to your students.* Visually impaired students in particular can benefit from explicit instruction in various strategies (Smith et al., 2016). Whereas other students can acquire some of these strategies through observation, visually impaired students will need extra support in learning many strategies. In addition, some strategies (e.g., highlighting important text while reading) will not be possible for students with severe visual impairments; nevertheless, alternative strategies often are available. Collaborative partnerships with special educators are particularly beneficial in these situations.

## HEARING LOSS

Students with **hearing loss** have a malfunction of the ears or associated nerves that interferes with the perception of sounds within the frequency range of normal human speech. Two to three of every 1,000 children born in the United States have detectable hearing loss at birth (National Institute on Deafness and Other Communication Disorders, 2014). Students who are completely *deaf* have insufficient sensation to understand any spoken language, even with the help of a hearing aid. Students who are *hard of hearing* understand some speech but experience exceptional difficulty in doing so.

### COMMON CHARACTERISTICS

Most students with hearing loss have normal intellectual abilities (Braden, 1992; Schirmer, 1994). However, they may have characteristics such as these:

- Delayed language development because of reduced exposure to spoken language, especially if the impairment was present at birth or emerged early in life
- Proficiency in sign language, such as American Sign Language (ASL) or finger spelling
- Some ability to read lips (*speechreading*)
- Less oral language than that of hearing classmates; perhaps a monotonous, hollow quality to speech
- Less developed reading skills, especially if language development has been delayed
- Less general world knowledge because of reduced exposure to spoken language
- Some social isolation, more limited social skills, and reduced perspective-taking ability as a result of a reduced ability to communicate (Bassett et al, 1996; Chall, 1996; P. L. Harris, 2006; Heward, 2009; C. C. Peterson, 2002; M. B. Rowe, 1978; Schick, de Villiers, de Villiers, & Hoffmeister, 2007; Turnbull et al., 2010)

### ADAPTING INSTRUCTION

Specialists typically provide training in such communication skills as American Sign Language, finger spelling, and speechreading. With these additions (and possibly some remedial instruction in reading and vocabulary), a normal school curriculum is appropriate for most students with

hearing loss. However, several accommodations can facilitate students' success in general education classrooms:

- 🍏 *Minimize irrelevant noise.* Even when students can benefit from hearing aids, what they hear is often diminished or distorted; consequently, it's helpful to minimize potentially distracting sounds. For example, carpeting and bulletin boards can absorb some extraneous noise, and fans and pencil sharpeners should be located as far away as possible.
- 🍏 *Supplement auditory presentations with visual information and hands-on experiences.* We can write important points on the chalkboard, illustrate key ideas with pictures, provide reading materials that duplicate lectures, and ask an aide or student volunteer to take notes on in-class discussions. We can also provide speech-to-text software, which enables students to translate spoken words into written language with reasonable accuracy. And we can use concrete activities (e.g., role-playing historical events) to make abstract ideas more understandable.
- 🍏 *Communicate in ways that help students hear and speechread.* Students who are hard of hearing are most likely to understand us when we speak in a normal tone of voice (not overly loud) and pronounce words distinctly but otherwise normally. To help students speechread, we should speak only while facing them and never while sitting in a dark corner or standing in front of a window or bright light (Gearheart, Weishahn, & Gearheart, 1992; J. W. Wood, 1998).
- 🍏 *Teach American Sign Language and finger spelling to classmates.* To facilitate communication with students who have hearing loss, other class members should gain some competence in American Sign Language and finger spelling. One of us authors once taught at a school where *every* student—those with hearing loss and those without—received instruction in signing. One girl in the author's class was totally deaf yet quite popular with her peers, thanks to everyone's ability to communicate easily.

## GENERAL RECOMMENDATIONS

In addition to the strategies just identified for specific physical disabilities, several more general strategies are useful with all students who have physical or sensory challenges:

- 🍏 *Ensure that all students have access to important educational resources and opportunities.* Such access may involve modifying instructional materials (e.g., obtaining large-print copies of textbooks), adjusting a classroom's physical arrangement (e.g., widening aisles and placing bulletin board displays at eye level to accommodate students in wheelchairs), or making special arrangements that enable students to participate in field trips or sports activities.
- 🍏 *Provide assistance only when students really need it.* Out of their eagerness to help students with physical and sensory challenges, many adults inadvertently perform tasks and solve problems that these students are perfectly capable of handling on their own. Yet one of our goals for these students should be to promote their independence, not their dependence on others (Wehmeyer et al., 2007).
- 🍏 *Use assistive technology to facilitate learning and performance.* We've already mentioned the value of print-reading software and speech-to-text software for students with sensory challenges. In addition, some computer printers can create Braille documents, enabling students with visual impairments to read their own class notes and compositions. Specially adapted joysticks and voice recognition systems can supplement or replace computer keyboards for students with limited muscle control. And machines known as augmentative communication devices provide synthesized speech for students incapable of producing normal speech.

### MyEdLab Self-Check 5.4

#### MyEdLab Application Exercise 5.6.

In this interactive exercise you can practice identifying adaptations that improve learning for students with sensory challenges and strategies that build on their strengths.



# Students with Advanced Cognitive Development

Many students are apt to have advanced abilities, either in specific subject areas or across the curriculum, that warrant attention and encouragement. Some students—those who are *gifted*—are so far above the norm that special educational services are often appropriate. We often will encounter gifted students in our classes; as we'll see, there are numerous considerations in adapting instruction to engage and challenge gifted students.

## GIFTEDNESS

In general, **giftedness** is unusually high ability or aptitude in one or more areas (e.g., in math, science, creative writing, or music) to such a degree that special educational services are necessary to help the student meet his or her full potential. In most instances giftedness is probably the result of both a genetic predisposition and environmental nurturing (Dai, 2010; Simonton, 2001; Winner, 2000b). In some cases, however, special gifts and talents are largely the result of intensive practice and mentoring (Ericsson, 2003; Gladwell, 2006). The identification of a child as gifted is often a reflection of the values of one's society. Thus, a student who is gifted in sculpting might not be identified as such in a community in which sculpting (or art, more generally) is not valued (Subotnik, Olszewski-Kubilius, & Worrell, 2011).

Giftedness is not included in IDEA. In the United States, the Jacob K. Javits Gifted and Talented Student Education Act of 1987 (reauthorized in 1994 and 2001) encourages but doesn't necessarily mandate special educational services for students who are gifted. Many state governments also either encourage or mandate such services. School districts often use multiple criteria—sometimes including intelligence test scores, sometimes not—to identify students who show exceptional promise in general academic ability, specific academic fields, creativity, or the arts. A current debate is whether gifted education should be to develop eminence and talent, or to provide opportunities for students to develop newly emerging talents (Subotnik & Rickoff, 2010).

## COMMON CHARACTERISTICS

Students who are gifted vary considerably in their unique strengths and talents, and those who show exceptional talent in one area may have only average ability in another (Winner, 2000b). Nevertheless, many students who are gifted have characteristics such as these:

- Advanced vocabulary, language, and reading skills
- Extensive general knowledge about the world
- Ability to learn more quickly, easily, and independently than peers
- Advanced and efficient cognitive processes and learning strategies
- Considerable flexibility in ideas and approaches to tasks
- High standards for performance (sometimes to the point of unhealthy perfectionism)
- High motivation to accomplish challenging tasks; boredom during easy tasks
- Strong interest in the area in which strengths have been identified
- Positive self-concept, especially with regard to academic endeavors
- Average or above-average social development and emotional adjustment (although a few extremely gifted students may have difficulties because they are so *very* different from their peers) (Dai, 2010; Mendaglio, 2010; Parker, 1997; Shavinina & Ferrari, 2004; Steiner & Carr, 2003; Subotnik et al., 2011; Subotnik, Olszewski-Kubilius, & Worrell, 2012; Winner, 2000a, 2000b)

To some degree, the nature of giftedness depends somewhat on where students are in their developmental journeys (Dai, 2010; D. J. Matthews, 2009). In the preschool and early elementary years, giftedness might take the form of precociousness in certain general domains; for example, a first grader might be reading sixth-grade-level books or exhibit exceptional facility with numbers. By the upper elementary and secondary grades, some students are likely to show exceptional achievement in very specific areas—perhaps in creative writing, computer technology, or music.



MyEdLab

### Video Example 5.8.

Students with advanced cognitive development vary considerably in their gifts and talents, but they generally have the ability to learn more quickly and independently than peers. They often have high standards for performance and high motivation to accomplish challenging tasks.

From the perspective of Vygotsky's theory (Chapter 2), when gifted students are given the same assignments as their average-ability peers, they're unlikely to be working within their zone of proximal development and therefore are unlikely to make significant cognitive advancements.

Working with a mentor often takes the form of a cognitive apprenticeship (see Chapter 2).

Yet we must keep in mind that students who are gifted may also have one or more disabilities; for instance, they may have dyslexia or Asperger syndrome. In planning instruction for such students, we must address their disabilities as well as their unique gifts.

### ADAPTING INSTRUCTION

Exceptional talents and achievement levels typically require ongoing environmental nurturance and support, in the forms of both differentiated instruction and access to appropriate resources and practice opportunities. Furthermore, many high-achieving students become bored or frustrated when school assignments don't challenge them, and others become so accustomed to the "easy A" that they have trouble coping with the mistakes they're likely to make when they venture into new areas (Dai, 2010; Mendaglio, 2010; Parker, 1997). With such points in mind, we offer the following recommendations:

- 🍏 *Provide individualized tasks and assignments.* Different students are apt to need special services in very different areas—for example, in math, creative writing, or studio art. Some students who are gifted, especially those with only a limited background in English, may also need training in certain basic skills (C. R. Harris, 1991; Udall, 1989).
- 🍏 *Form study groups of students with similar interests and abilities.* In some cases a study group might explore a topic in greater depth and with more sophisticated analysis than other students (an *enrichment* approach). In other instances a study group might simply move through the standard school curriculum at a more rapid pace (an *acceleration* approach). Enrichment and acceleration are both beneficial for gifted students, and they are not mutually exclusive—courses can potentially be both accelerated and enriching simultaneously (Rogers, 2002; Subotnik et al., 2011). Students benefit both academically and socially from increased contact with peers who have similar interests and talents (Hattie, 2009; J. A. Kulik & Kulik, 1997; McGinn, Viernstein, & Hogan, 1980).
- 🍏 *Teach complex cognitive skills within the context of specific subject areas.* Programs designed to enhance students' creativity, critical thinking, or other complex skills separately from specific content domains tend to have only limited impact. Teaching complex thinking skills within the context of specific topics—for example, creativity in writing or reasoning and problem-solving skills in science—is more likely to be effective (Dai, 2010; M. C. Linn, Clement, Pulos, & Sullivan, 1989; Moon, Feldhusen, & Dillon, 1994; Stanley, 1980).
- 🍏 *Provide opportunities for independent study and service learning projects.* Independent study and community service projects in areas of interest are often beneficial and motivating for high-ability students, provided that they have the work habits, study strategies, and research skills they need to use their time and resources effectively (Candler-Lorven, Tallent-Runnels, Olivárez, & Hildreth, 1994; Terry, 2008). However, even if students are working on projects of this nature, it is important that gifted students have clear goals, and are provided with continuous feedback as they progress toward these goals (Callahan, Moon, Oh, Azano, & Hailey, 2015).
- 🍏 *Seek outside resources.* When students have high abilities in domains outside our own areas of expertise, it's often helpful to identify suitable mentors elsewhere in the school district or in the community at large—perhaps at a local university, government office, private business, or volunteer community group (Ambrose, Allen, & Huntley, 1994; Piirto, 1999; Seeley, 1989).
- 🍏 *Keep in mind that students with exceptional cognitive abilities aren't necessarily advanced in other aspects of their development.* Most students with special gifts and talents have the same personal and emotional concerns as their average-ability age-mates (D. J. Matthews, 2009). For example, gifted sixth graders making the transition to middle school are likely to have the typical thoughts and feelings of a young adolescent: whether they'll fit in with a new peer group, whom to sit with at lunch, and so on. They may worry that their peers will see their exceptional ability levels as odd or in some other way unacceptable (Mendaglio, 2010). And they're likely to be surprised or anxious when they discover that they must exert considerable effort to master challenging new skills and that they sometimes make errors in the process (Mendaglio, 2010). For such reasons, high-ability students are likely to need as

much emotional support as their classmates, and they may occasionally need gentle reminders that only new challenges can truly help them grow and that new skills require practice, regardless of innate levels of ability.

#### MyEdLab Self-Check 5.5

**MyEdLab Application Exercise 5.7.** In this interactive exercise you can apply what you have learned about nurturing the development of students who show exceptional gifts and talents.



## Considering Diversity When Identifying and Addressing Special Needs

Sadly, a disproportionately large number of minority-group students are identified as having disabilities, especially specific cognitive disabilities, general intellectual disabilities, and emotional and behavioral disorders (McLoyd, 1998; U.S. Department of Education, 2006; VanTassel-Baska, 2008). Most theorists attribute the differing identification rates to environmental conditions that often accompany low socioeconomic status: higher-than-normal exposure to environmental toxins, poor nutrition, inadequate medical care, limited access to enriching educational resources, and so on (e.g., Dyson, 2008; Jacoby & Glauber, 1995; McLoyd, 1998). Also, English language learners are identified as having learning disabilities or intellectual disabilities more often than native English speakers—a finding that probably reflects students' difficulty in understanding and responding to items on language-based diagnostic tests (A. L. Sullivan, 2008).

The higher-than-average identification rates for minority-group students pose a dilemma for educators. On the one hand, we don't want to assign a label such as *intellectual disability* or *emotional disorder* to students whose classroom performance and behavior may be due largely to their challenging living conditions. On the other hand, we don't want to deprive these students of special educational services that might help them learn and achieve more successfully over the long run. In such situations we must conduct fair and nondiscriminatory evaluations of students' needs, and if students qualify under a special-needs category, we must create IEPs to meet those needs. We should consider these categories of special needs as *temporary* classifications that may no longer be applicable as students' classroom performance improves. *All* students, with and without disability classifications, have changing needs that evolve over time, and federal law requires that IEPs be revisited at least once a year.

In addition to being overrepresented in programs for students with disabilities, members of some minority groups are underrepresented in programs for gifted students (D. Y. Ford, 2012, 2014; Graham, 2009; VanTassel-Baska, 2008). Furthermore, when students from underrepresented groups are identified for participation in gifted education programs, teachers often need to carefully mentor and monitor students to encourage them to remain in these programs (Moore, Ford, & Milner, 2011). On average, students from cultural and ethnic minority groups are at a disadvantage when traditional tests of ability are used to identify giftedness—in some cases because they've had little experience with the kinds of tasks that appear on those tests (Rogoff, 2003). It's critical, then, that we be on the lookout for other signs of giftedness, including the following:

- Exceptional talent in a specific area (e.g., in music or video game design)
- Ability to learn quickly from experiences
- Exceptional communication skills (e.g., articulateness, richness of language)
- Originality and resourcefulness in thinking and problem solving
- Ability to generalize concepts and ideas to new, seemingly unrelated situations (Dai, 2010; Haywood & Lidz, 2007; Winner, 1996)

For the growth of our society over the long run, it's imperative that we nurture the many gifted students in *all* cultural and ethnic groups.



Especially when working with students identified as having cognitive, emotional, or behavioral difficulties, think of their disability labels as *temporary* classifications that may no longer be applicable as classroom performance improves.



Look beyond IQ scores in identifying students who may be gifted; for instance, look for specialized talents, richness of language, an ability to learn new things quickly, and exceptional resourcefulness in solving problems.



## General Recommendations for Working with Students Who Have Special Needs

Although students with special educational needs vary widely in their abilities and disabilities, several recommendations apply across the board:

Chapter 14 and Chapter 15 offer numerous suggestions for accommodating disabilities in assessments.



MyEdLab

### Video Example 5.9.

Students are complex and sometimes bring unique combinations of talents and special needs to the classroom. Teachers must look beyond IQ scores to identify students who may be gifted, and look beyond a student's disability to recognize exceptionality.

Such choice making can enhance both *self-regulation and autonomy*, discussed in Chapter 10 and Chapter 11, respectively.

- 🍏 *Be flexible in approaches to instruction and assessment.* Even when students clearly fall within a particular category of special needs, we can't always predict which instructional methods will be most effective for each of them. If we don't succeed with a particular approach, we should try again, but we might also want to try *differently*. Furthermore, we must keep open minds about how we assess students' achievement; depending on the nature of their disabilities, we may need to give them extra time, let them audiotape responses, tailor assessment tasks to an individualized curriculum, and so on (Royer & Randall, 2012).
- 🍏 *Seek new technologies that can facilitate students' learning and performance.* As we've seen, assistive technology takes a wide variety of forms—spell checkers, handheld prompters, speech-to-text software, and so on—and exciting new technologies emerge every year. Software also is becoming readily available so that students with disabilities can work with technology that is now fairly common in schools, such as iPads (Chai, Vail, & Ayres, 2015). Frequent searches of the Internet can alert us to recent innovations (e.g., search for “assistive technology devices” on Google or Yahoo!).
- 🍏 *Unless there is reason to do otherwise, hold the same expectations for students with disabilities as for other students.* Sometimes a disability makes it difficult or impossible for students to accomplish certain tasks, and we have to modify our expectations and assessment practices accordingly. Aside from such situations, however, we should generally have the same expectations for students with special needs that we have for other students. Rather than think of reasons that a student *can't* do something, we should think about how we can help the student *do* it. When partnering with a special educator, both the classroom teacher and the special educator need to hold similar high expectations, while simultaneously partnering to provide appropriate supports for the student.
- 🍏 *Identify and teach the prerequisite knowledge and skills students may not have acquired because of their disabilities.* As either a direct or indirect result of certain disabilities, some students lack the knowledge and skills essential for their school success. For instance, students with visual impairments haven't been able to observe many of the cause-and-effect relationships that form a foundation for learning science—such as the changes in the appearance of wood when it's burned (Ferrell, 1996; M. B. Rowe, 1978). Students also may need assistance using online texts and materials (Greer, Rowland, & Smith, 2014). And students whose medical conditions have limited their contact with peers may have had few opportunities to acquire effective interpersonal skills.
- 🍏 *Consult and collaborate with specialists.* School districts usually employ a variety of specialists, including special educators, counselors, school psychologists, nurses, speech pathologists, and physical and occupational therapists. Some students leave the classroom for part of the day to work with these individuals. However, in today's inclusive schools many special services are provided within a regular classroom context by teachers and specialists working in close collaboration.
- 🍏 *Communicate regularly with parents.* In accordance with IDEA, parents are part of the multidisciplinary team that determines the most appropriate program for a student with special needs. Parents can often tell us what works and what doesn't, and they can alert us to certain conditions or events at home that may trigger problem behaviors in class. Furthermore, we can bring about desired behavioral changes more effectively if the same expectations for behavior exist both at school and at home.
- 🍏 *Include students in planning and decision making.* Programs for most students with special needs—especially those with disabilities—are so highly structured that students have little say regarding what and how they learn. But increasingly, educators are recognizing the importance of letting *all* students make some choices about their academic goals and curriculum (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Prout, 2009; Wehmeyer et al., 2007).

- 🍏 *Keep your eyes open for students who may qualify for special services.* The more we work with students in a particular age-group, the more we learn about their age-typical abilities and behaviors. Hence, we teachers are in an excellent position to identify children who in one way or another are *not* typical. Although specialists usually conduct the in-depth assessments necessary to identify particular special needs, the job of referring students for such assessments—and thereby gaining them access to the specialized services they may need—is ultimately up to teachers in general education classrooms.
- 🍏 *Work with your other students toward acceptance and support of students with special needs.* As we've already noted elsewhere in the chapter, many students with disabilities have trouble being accepted by and developing friendships with peers in their classes (de Boer, Pijl, Post, & Minnaert, 2013). As teachers, having a student with any type of exceptionality in our classroom is a wonderful opportunity for our other students. When a child or adolescent learns about various disabilities firsthand, and learns to respect and value these differences, such respect may last a lifetime.

## 5



## What Have You Learned?

Let's now review key points related to each of the chapter's learning outcomes.

- **5.1: Describe various perspectives on the nature of intelligence, and identify several ways in which you can nurture intelligence in your own students.** Intelligence involves the ability to apply prior knowledge and experiences flexibly to accomplish challenging tasks; it's apt to manifest itself differently in different cultures. Some psychologists believe that intelligence is a single, biology-based entity that influences students' learning and performance across a wide variety of tasks and subject areas—a belief that's reflected in the use of IQ scores as general estimates of cognitive ability. Others disagree, proposing that intelligence consists of a number of somewhat independent abilities or, instead, that intelligent behavior varies considerably depending on a child's age and environmental support systems. As teachers, we must remember that human intelligence can and does change over time, especially with appropriate instruction and practice opportunities.
- **5.2: Explain how students' cognitive styles and dispositions might influence their classroom performance.** *Cognitive styles* and *dispositions* are general inclinations to approach tasks in particular ways—for instance, to think analytically or holistically or to approach new ideas in an open-minded or close-minded manner. We can encourage productive styles and dispositions through the messages we give about classroom subject matter (e.g., “Does the evidence support what scientists are saying about this topic?”) and by modeling curiosity and enthusiasm for learning.
- **5.3: Identify implications of the U.S. Individuals with Disabilities Education Act (IDEA) for your own work as a teacher.** Students with special needs are those students who are different enough from their classmates that they require

specially adapted instructional materials and practices to help them maximize their cognitive and social development. Increasingly, students with special needs are being educated in general education classrooms for part or all of the school day; in the United States, such *inclusion* is in part the result of a mandate of the Individuals with Disabilities Education Act (IDEA). Students with special needs are most likely to flourish in general education settings when instruction and materials are individualized to address any missing basic skills but also present challenges that spur developmental advancements.

- **5.4: Explain how you might adapt your instruction and classroom practices to the unique strengths and limitations of students with various disabilities.** Students with specific cognitive or academic difficulties include those with learning disabilities, those with attention-deficit hyperactivity disorder (ADHD), and those with speech and communication disorders. Many instructional strategies must be tailored to students' specific difficulty areas, but some strategies are widely applicable; for instance, virtually all of these students benefit from early interventions, clear expectations for performance, and feedback that documents ongoing progress.

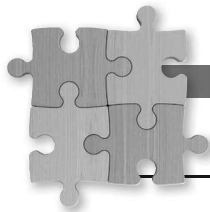
Students with social or behavioral problems include those with emotional and behavioral disorders (which might involve either externalizing or internalizing behaviors) and those with autism spectrum disorders. Many students with these disabilities benefit from training in interpersonal skills. They may also perform more successfully in a structured environment in which appropriate behaviors are clearly identified and consequences for desired and undesired behaviors are consistently administered.

Some students have general delays in cognitive and social functioning, and some of these students are formally diagnosed as having an intellectual disability. Effective instruction

for these students usually involves a slow pace with considerable scaffolding and, eventually, explicit training in vocational and general life skills.

Students with physical and sensory challenges include those with physical and health impairments (conditions that result in reduced energy, alertness, or muscle control), visual impairments, or hearing loss. Although recommended instructional strategies vary considerably depending on students' specific disabilities, all of these students should have appropriate assistive technologies and access to the same educational resources and opportunities as their nondisabled peers.

- **5.5: Explain how you might nurture the development of students who show exceptional gifts and talents.** Most students identified as gifted require individualized instruction that challenges them to stretch their existing abilities in new directions. We must be open-minded about how we identify such students, as giftedness may take different forms in different cultural and ethnic groups. Strategies for promoting the achievement of gifted students include forming small study groups on specific topics, teaching complex cognitive skills within the context of various academic subject areas, and providing opportunities for independent study and service learning either within or outside of school walls.



## Practice for Your Licensure Exam

### A Different Megan

Megan recently started the first grade at a new school. Her teacher, Ms. Bailey, has noticed that Megan is fidgety and has trouble concentrating and completing some of the tasks assigned. Megan loves working on puzzles and arts and crafts. Ms. Bailey has also observed that Megan becomes disruptive during reading lessons, and this is affecting the rest of the class. A meeting was held with Megan's parents, and Ms. Bailey found out that Megan's mother had recently started traveling a lot for work and was therefore often not available to help Megan with her studies. Megan's father did not complete formal schooling, and although he was never officially diagnosed, he believes he has a learning disability. Ms. Bailey informed the parents that Megan often complains about how hard reading is; that she has not made a close friend yet and sometimes spends breaks alone; that she cannot write simple words other than her name; and that she can become bossy and demanding when faced with a reading or writing task but at other times is very sweet and friendly. Her parents are worried because this behavior was very unlike Megan, who had been popular at her old school and had

always received positive comments from her previous teacher. Taking into account her own observations and the information gathered from Megan's parents, Ms. Bailey decides to formally request the school psychologist to conduct an in-depth evaluation of Megan's abilities and behavior.

**1. Multiple-choice question:**

What is the least likely cause of Megan's behavior?

- a. A learning disability
- b. An emotional and behavioral disorder
- c. Emotional immaturity and acting out
- d. Adjustment to the new environment

**2. Constructed-response question:**

Megan's evaluation will probably take several weeks to complete. In the meantime, what strategies can Ms. Bailey use to improve Megan's behavior and performance in the classroom? Describe at least three different things that she can do.

MyEdLab Licensure Exam 5.1

**PRAXIS** Go to Appendix C, "Matching Book Content to the Praxis Principles of Learning and Teaching Tests," to discover sections of this chapter that may be especially applicable to the Praxis tests.