Learn Differences and Learning Needs
What Would You Do?

Teachers' Casebook

It is a new school year and your district has had a change in policy. Special Education programs have been discontinued and ALL students will now be included in general education classrooms full time. You knew that you were going to have students with a wide range of abilities, social skills, and motivation for learning in your classroom, but now you also have a student who is deaf, two students who speak very little English, and a student with severe learning disabilities. Based on No Child Left Behind, you are accountable for the learning of all of your students so that your school will show that it is making Annual Yearly Progress.

Critical Thinking

- How will you design a standards-based curriculum that will allow all of the students to learn to their fullest potential and demonstrate proficiency toward the standards?
- What can you do to address the specific problems of your students who have been identified with special needs?

Collaboration

With 2 or 3 other students in your class, plan some strategies for teaching and monitoring the progress of all your students.

To answer the questions above, you need an understanding of individual differences. So far, we have talked little about individuals. We have discussed principles of development that apply to everyone—stages, processes, conflicts, and tasks. Our development as human beings is similar in many ways, but not in every way. Even among members of the same family, there are marked contrasts in appearance, interests, abilities, and temperament, and these differences have important implications for teaching. In addition, you probably will have at least one student with special needs in your class, whatever grade you teach. In this chapter, we explore both common and less frequently occurring learning problems that students may have. As we discuss each problem area, we will consider how a teacher might recognize problems, seek help, and plan instruction. By the time you have completed this chapter, you should be able to answer these questions:

- What are the potential problems in categorizing and labeling students?
- What is your personal concept of intelligence?
- What is your stance on ability grouping?
- Should you adapt lessons for students with varying learning styles?
- What are the implications of the Individuals with Disabilities Education Improvement Act (IDEIA) and Section 504 for your teaching?
- In your classroom, how will you identify and teach students with hearing, vision, language, and behavior problems, specific learning disabilities, as well as those who are gifted?
Intelligence

Because the concept of intelligence is so important in education, so controversial, and so often misunderstood, we will spend quite a few pages discussing it. But before we begin, let’s examine the practice of labeling people based on differences such as intelligence, ability, or disability.

Labeling

Every child is a distinctive collection of talents, abilities, and limitations. In that sense, all children are “exceptional.” But some are called exceptional students because their physical, intellectual, or behavioral skills and abilities differ substantially from the norm—either higher or lower. For example, they may have special abilities and talents, learning disabilities, communication disorders, emotional or behavioral disorders, intellectual disabilities, physical disabilities, impaired vision or difficulties hearing, autism, traumatic brain injury, or some combination (Hardman, Drew, & Egan, 2005). Even though we will use terms like these throughout the chapter, a caution is in order: Labeling students is a controversial issue.

A label does not tell which methods to use with individual students. For example, few specific “treatments” automatically follow from a “diagnosis” of intellectual disabilities; many different teaching strategies and materials are appropriate. Further, the labels can become self-fulfilling prophecies. Everyone—teachers, parents, classmates, and even the students themselves—may see a label as a stigma that cannot be changed. Finally, labels are mistaken for explanations, as in, “Santiago gets into fights because he has a behavior disorder.” “How do you know he has a behavior disorder?” “Because he gets into fights.”

On the other hand, some educators argue that for younger students, at least, being labeled as “special” protects the child. For example, if classmates know a student has intellectual disabilities (sometimes called cognitive disabilities), they will be more willing to accept his or her behaviors. Of course, labels still open doors to some special programs, useful information, special technology and equipment, or financial assistance. Labels probably both stigmatize and help students (Hallahan, Lloyd, Kauffman, Weiss, & Martinez, 2005; Hardman, Drew, & Egan, 2005).

Person-First Language. This caution about labeling also applies to many of the common descriptions heard in schools every day. Today, many people object to labels such as “mentally retarded student” or “at-risk student” because describing a complex person with one or two words implies that the condition labeled is the most important aspect of the person. Actually, the individual has many abilities, and to focus on the disability is to misrepresent the individual. An alternative is “person-first” language or speaking of “students with intellectual disabilities” or “students placed at risk.” Here, the emphasis is on the students first, not on the special challenges they face. Other examples suggested by Meece (2002, p. 317) are:

- A student with a learning disability NOT A learning disabled student
- Students receiving special education NOT Special education students
- A person with epilepsy NOT An epileptic
- A child with a physical disability NOT A crippled child
- Children diagnosed with autism NOT Autistic children or autistics

Disorders, Disabilities and Handicaps. One more distinction in language is important. A disorder is a broad term—a general disturbance in physical or mental functioning, for example, a communications disorder. A disability is just what the word implies—an inability to do something specific such as pronounce words or see or walk. A handicap is a disadvantage in certain situations. Some disabilities lead to handicaps, but not in all contexts. For example, being blind (a visual disability) is a handicap if you want to drive a car.
But blindness is not a handicap when you are composing music or talking on the telephone. Stephen Hawking, the greatest living physicist, suffers from Lou Gehrig's disease and no longer can walk or talk. He once said that he is lucky that he became a theoretical physicist "because it is all in the mind. So my disability has not been a serious handicap." It is important that we do not create handicaps for people by the way we react to their disabilities. Some educators have suggested that we drop the word "handicap" altogether because the source of the word is demeaning. Handicap came from the phrase "cap in hand," used to describe people with disabilities who once were forced to beg just to survive (Hardman, Drew, & Egan, 2005).

We can think of all human characteristics as being on a continuum, from very acute hearing to complete deafness for instance. We all fall somewhere on that continuum and we change over our lifetimes. As we age, for example, there are likely to be changes in hearing, vision, even some aspects of intellectual ability, as you will see later in this chapter.

Intelligence is a widely used label in education and life in general. Let us begin with a basic question. . . .

What Does Intelligence Mean?

**STOP THOUGHT WRITE** Who was the most intelligent person in your high school? Write down a name and the first 4 or 5 words that come to mind when you see that person in your mind's eye. What made you pick this individual?

The idea that people vary in what we call intelligence has been with us for a long time. Plato discussed similar variations over 2,000 years ago. Most early theories about the nature of intelligence involved one or more of the following three themes: (1) the capacity to learn; (2) the total knowledge a person has acquired; and (3) the ability to adapt successfully to new situations and to the environment in general.

During the past century, there was considerable controversy over the meaning of intelligence. Thirteen psychologists in 1921 and 24 psychologists in 1986 met to discuss intelligence. Both times, every psychologist had a different view about the nature of intelligence (Neisser et al., 1966; Sternberg & Detterman, 1986). Both times, about half of the experts mentioned higher-level thinking processes such as abstract reasoning and problem solving as important aspects of intelligence. The 1986 definitions added metacognition and executive processes (monitoring your own thinking), the interaction...
of knowledge with mental processes, and the cultural context—what is valued by the culture—as elements of intelligence. But in 1921 and again in 1956, the psychologists disagreed about the structure of intelligence—whether it is a single ability or many separate abilities (Gustafsson & Undheim, 1996; Louis, Subotnik, Breland, & Lewis, 2000; Sattler, 2001; Sternberg, 2004).

**Intelligence: One Ability or Many?** Some theorists believe intelligence is a basic ability that affects performance on all cognitively oriented tasks, from computing mathematical problems to writing poetry or solving riddles. Evidence for this position comes from study after study finding moderate-to-high positive correlations among all the different tests that are designed to measure separate intellectual abilities (Carroll, 1993; McNemar, 1964). What could explain these results? Charles Spearman (1927) suggested there is one mental attribute, which he called g or general intelligence, used to perform any mental test, but each test also requires some specific abilities in addition to g. For example, memory for a series of numbers probably involves both g and some specific ability for immediate recall of what is heard. Spearman assumed that individuals vary in both general intelligence and specific abilities, and that together these factors determine performance on mental tasks.

Another view that has stood the test of time is Raymond Cattell and John Horn’s theory of fluid and crystallized intelligence (Cattell, 1963; Horn, 1998). **Fluid intelligence** is mental efficiency that is essentially culture-free and nonverbal. This aspect of intelligence increases until adolescence because it is grounded in brain development, then declines gradually with age. Every year, it gets harder for me to write that sentence! Fluid intelligence is sensitive to injuries. In contrast, crystallized intelligence, the ability to apply culturally approved problem-solving methods, can increase throughout the life span because it includes the learned skills and knowledge such as vocabulary, facts, and how to fill a cab, make a quilt, or study in college. By investing fluid intelligence in solving problems, we develop our crystallized intelligence, but many tasks in life such as mathematical reasoning draw on both fluid and crystallized intelligence (Finkel, Reynolds, McArdle, Gatz, & Peterson, 2003; Hunt, 2000).

The most widely accepted view today is that intelligence, like self-concept, has many facets and is a hierarchy of abilities, with general ability at the top and more specific abilities at lower levels of the hierarchy (Sternberg, 2000). Earl Hunt (2000) summarized the current thinking about the structure of intelligence this way:

> After almost a century of such research, that structure is pretty well-established. There is considerable agreement for the bottom two levels of a three-tiered lattice model of intelligence. At the bottom are elementary information-processing actions, and immediately
above them are eight or so secondary abilities. These are more broadly defined capabilities, such as holding and accessing information in short- and long-term memory and, most importantly, the trio of "intellectual" abilities: crystallized intelligence, fluid intelligence, and visual-spatial reasoning ability [which] may be just the most visible of several abilities to manipulate information coded in a particular sensory modality. (p. 123)

Look at Figure 4.1 to see an example of this three-level view of intelligence. John Carroll (1997) identifies one general ability, a few broad abilities (such as fluid and crystallized abilities, learning and memory, visual and auditory perception, processing speed) and at least 70 specific abilities such as language development, memory span, and simple reaction time. General ability may be related to the maturation and functioning of the frontal lobe of the brain, while specific abilities may be connected to other parts of the brain (Byrnes & Fox, 1998).

**Multiple Intelligences**

In spite of the correlations among the various tests of different abilities, some psychologists insist that there are several separate mental abilities (Gardner, 1983; Guilford, 1988). According to Gardner's (1983, 2003) **theory of multiple intelligences**, there are at least eight separate intelligences: linguistic (verbal), musical, spatial, logical-mathematical, bodily-kinesthetic (movement), interpersonal (understanding others), intrapersonal (understanding self), and naturalist (observing and understanding natural and human-made patterns and systems). Gardner stresses that there may be more kinds of intelligence—eight is not a magic number. Recently, he has speculated that there may be a spiritual intelligence and an existential intelligence—the abilities to contemplate big questions about the meaning of
### TABLE 4.1

Eight intelligences.

Howard Gardner's theory of multiple intelligences suggests that there are eight kinds of human abilities. An individual might have strengths or weaknesses in one or several areas.

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>End States</th>
<th>Core Components</th>
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<tbody>
<tr>
<td>Logical-mathematical</td>
<td>Scientist</td>
<td>Sensitivity to, and capacity to discern, logical or numerical patterns; ability to handle long chains of reasoning.</td>
</tr>
<tr>
<td></td>
<td>Mathematician</td>
<td></td>
</tr>
<tr>
<td>Linguistic</td>
<td>Poet</td>
<td>Sensitivity to the sounds, rhythms, and meanings of words; sensitivity to the different functions of language.</td>
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<tr>
<td></td>
<td>Journalist</td>
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</tr>
<tr>
<td>Musical</td>
<td>Composer</td>
<td>Abilities to produce and appreciate rhythm, pitch, and timbre; appreciation of the forms of musical expressiveness.</td>
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<tr>
<td></td>
<td>Violinist</td>
<td></td>
</tr>
<tr>
<td>Spatial</td>
<td>Navigator</td>
<td>Capacities to perceive the visual-spatial world accurately and to perform transformations on one's initial perceptions.</td>
</tr>
<tr>
<td></td>
<td>Sculptor</td>
<td></td>
</tr>
<tr>
<td>Bodily-kinesthetic</td>
<td>Dancer</td>
<td>Abilities to control one's body movements and to handle objects skilfully.</td>
</tr>
<tr>
<td></td>
<td>Athlete</td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Therapist</td>
<td>Capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people.</td>
</tr>
<tr>
<td></td>
<td>Salesman</td>
<td></td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Person with detailed, accurate self-knowledge</td>
<td>Access to one's own feelings and the ability to discriminate among them and draw on them to guide behavior; knowledge of one's own strengths, weaknesses, desires, and intelligence.</td>
</tr>
<tr>
<td>Naturalist</td>
<td>Botanist</td>
<td>Abilities to recognize plants and animals, to make distinctions in the natural world, to understand systems and define categories (perhaps even categories of intelligence).</td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hunter</td>
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**Connect and Extend to PRAXIS II**

Multiple Intelligences (U. 81).

Many teachers and education students believe that each student must address each of the 8 intelligences in each lesson they design. What are some of the educational implications of the theory for differentiated instruction? (O. 32)

Life (Gardner, 2003). Gardner bases his notion of separate abilities on evidence that brain damage (from a stroke, for example) often interferes with functioning in one area, such as language, but does not affect functioning in other areas. Also, individuals may excel in one of these eight areas, but have no remarkable abilities in the other seven.

Table 4.1 summarizes these eight intelligences.

**What Are These Intelligences?**

Gardner (1998, 2003) contends that an intelligence is the ability to solve problems and create products or outcomes that are valued by a culture. Varying cultures and eras of history place different values on the eight intelligences. A naturalist intelligence is critical in farming cultures, whereas verbal and mathematical intelligences are important in technological cultures. In addition, Gardner believes that intelligence has a biological base. An intelligence is "a biological and psychological potential; that potential is capable of being realized to a greater or lesser extent as a consequence of the experiential, cultural, and motivational factors that affect a person" (1998, p. 62).

Gardner's multiple intelligences theory has not received wide acceptance in the scientific community, even though it has been embraced by many educators. Some critics suggest that several intelligences are really talents (bodily-kinesthetic skill, musical ability) or personality traits (interpersonal ability). Other "intelligences" are not new at all.
Many researchers have identified verbal and spatial abilities as elements of intelligence. In addition, the eight intelligences are not independent; there are correlations among the abilities. In fact, logical-mathematical and spatial intelligences are highly correlated (Sternberg, 2001). So, these “separate abilities” may not be so separate after all. Recent evidence linking musical and spatial abilities has prompted Gardner to consider that there may be connections among the intelligences (Gardner, 1998). Stay tuned for more developments.

Gardner (1998, 2003) has responded to critics by identifying a number of myths and misconceptions about multiple intelligences theory and schooling. One is that intelligences are the same as learning styles. Gardner doesn’t believe that people actually have consistent learning styles. Another misconception is that multiple intelligences theory disproves the idea of g. Gardner does not deny the existence of a general ability, but does question how useful g is as an explanation for human achievements.

Multiple Intelligences Go to School. An advantage of Gardner’s perspective is that it expands teachers’ thinking about abilities and avenues for teaching, but the theory has been misused. Some teachers embrace a simplistic version. They include every “intelligence” in every lesson, no matter how inappropriate. Table 4.2 lists some misuses and positive applications of Gardner’s work.

Even though many teachers and schools are enthusiastic about Gardner’s ideas, there is not yet strong research evidence that adopting a multiple intelligences approach

| TABLE 4.2 |

| Misuses and Applications of Multiple Intelligence Theory |

<table>
<thead>
<tr>
<th>Misuses:</th>
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<tbody>
<tr>
<td>1. <strong>Trying to teach all concepts or subjects using all intelligences.</strong> “There is no point in assuming that every subject can be effectively approached in at least seven ways, and it is a waste of effort and time to attempt to do this.”</td>
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<tr>
<td>2. <strong>Assuming that it is enough just to apply a certain intelligence, no matter how you use it.</strong> For bodily-kinesthetic intelligence, for example, “random muscle movements have nothing to do with the cultivation of the mind.”</td>
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<tr>
<td>3. <strong>Using an intelligence as a background for other activities,</strong> such as playing music while students solve math problems. “The music’s function is unlikely to be different from that of a dripping faucet or humming fan.”</td>
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<tr>
<td>4. <strong>Mixing intelligences with other desirable qualities:</strong> For example, interpersonal intelligence is often distorted as a license for cooperative learning, and intrapersonal intelligence is often distorted as a rationale for self-esteem programs.</td>
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<tr>
<td>5. <strong>Direct evaluation or even grading of intelligences without regard to context:</strong> “I see little point in grading individuals in terms of how ‘linguistic’ or how ‘bodily-kinesthetic’ they are.”</td>
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<table>
<thead>
<tr>
<th>Good uses:</th>
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<tbody>
<tr>
<td>1. <strong>The cultivation of desired capabilities:</strong> “Schools should cultivate those skills and capabilities that are valued in the community and in the broader society.”</td>
</tr>
<tr>
<td>2. <strong>Approaching a concept, subject matter, discipline in a variety of ways:</strong> Schools try to cover too much. “It makes far more sense to spend a significant amount of time on key concepts, generative ideas, and essential questions and to allow students to become familiar with these notions and their implications.”</td>
</tr>
<tr>
<td>3. <strong>The personalization of education:</strong> “At the heart of the MI perspective—in theory and in practice—is taking human difference seriously.”</td>
</tr>
</tbody>
</table>

will enhance learning. In one of the few carefully designed evaluations, Callahan, Toul-linson, and Plucker (1997) found no significant gains in either achievement or self-concept for students who participated in START, a multiple intelligences approach to identifying and promoting talent in students who were at risk of failing. Learning is still hard work, even if there are multiple paths to knowledge. Perry Klein (2002) argues that the multiple intelligences theory is too broad to tell teachers how to teach. “For instance, the knowledge that basketball relies on ‘bodily-kinesthetic intelligence’ tells a coach nothing about the skills her players need to learn” (p. 228).

Emotional Intelligence

WHAT WOULD YOU SAY?

As part of the interview process for a job in a middle school, you are asked the following: “What do you think about the idea of emotional intelligence? Would you teach that in your class?”

Howard Gardner’s theory of multiple intelligences includes intrapersonal and interpersonal intelligences, or intelligence about self and others. Here we look a related perspective—emotional intelligence.

We all know people who are academically or artistically talented, but unsuccessful. They have problems in school, in relationships, and on the job, and can’t seem to improve the situations. According to some psychologists, the source of the difficulties may be a lack of emotional intelligence, first defined by Peter Salovey and John Mayer as the ability to process emotional information accurately and efficiently (Mayer & Cobb, 2000; Mayer & Salovey, 1997; Roberts, Zeidner, & Matthews, 2001). Daniel Goleman (1995) popularized the idea of emotional intelligence (EQ) in his best-selling book based on the work of Salovey and Mayer.

What Is EQ? At the center of emotional intelligence are four broad abilities: perceiving, integrating, understanding, and managing emotions (Mayer & Cobb, 2000). If you

Success in life requires more than cognitive skills: It is important to be emotionally “smart” as well. Teachers can help students develop emotional as well as cognitive intelligence.
can’t perceive what you are feeling, how can you make good choices about jobs, relationships, time management, or even entertainment (Baron, 1998)? Individuals who can perceive and understand emotions in others (usually by reading the nonverbal cues) and respond appropriately are more successful in working with people and often emerge as leaders (Wood & Wood, 1999). If you can’t integrate your emotions into your thinking about situations and understand your own emotions, how can you communicate your feelings to others accurately? Friends keep asking, “What’s wrong?” and you keep saying, “Nothing.”

Finally, you must manage your emotions, particularly negative emotions such as anger or depression. The goal is not to suppress feelings, but not to be overwhelmed by them either. Managing emotions includes the ability to focus energy, persist, control impulses, and delay gratification. Emotional management is critical in school. For example, compared to 4-year-old students who act on their impulses immediately, 4-year-old children who can delay gratification become much better students in high school (Shoda, Mischel, & Peake, 1990).

Some researchers have criticized the notion of EQ, saying that emotional intelligence is not a cluster of capabilities, but rather a set of personality traits or the application of general intelligence to social situations (Izard, 2001; Nestor-Baker, 1999). Does intelligence inform emotion so we are “smart” about managing our feelings and impulses, or does emotion inform intelligence so we make good decisions and understand other people? Probably both are true. The major point is that success in life requires more than cognitive skills, and teachers are important influences in helping students develop all of these capabilities.

**EQ Goes to School.** Some research suggests that programs designed to help students build their emotional competencies have beneficial effects, including an increase in cooperative behaviors and a reduction in anti-social activities such as the use of slurs and bullying. For example, Norita Felshbach (1998, 1997) developed a 36-hour program to help elementary students become more empathetic. The program included exercises such as deciding what each person in your family would like most as a birthday present or determining how the world would appear to you if you were a cat. Students also retold stories from the perspective of the different characters in a story, then played the role of each character in videotaped performances of the stories. Students learned to analyze how people looked and sounded as they played each role. Sandra Graham’s (1996) program for helping aggressive boys learn to read the intentions of others also included role plays and practice in reading the emotions of others. The educational advantages of decreased student aggression and increased empathy are obvious, but these skills also prepare students for life outside the classroom.

**Cautions.** One of the problems with innovations in educational psychology is that they are often inadvertently misinterpreted or ill-described in the popular media by writers and reporters who have limited backgrounds in both psychology and education. The concept of emotional intelligence is one innovation that seems to be facing that fate. Make sure the sources you read are based on research.

**Intelligence as a Process**

As you can see, the theories of Spearman, Cattell and Horn, Carroll, and Gardner tend to describe how individuals differ in the content of intelligence—different abilities. Recent work in cognitive psychology has emphasized instead the thinking processes that may be common to all people. How do humans gather and use information to solve problems and behave intelligently? No new views of intelligence are growing out of this work.

Robert Sternberg’s (1985, 2004) triarchic theory of successful intelligence is a cognitive process approach to understanding intelligence. Successful intelligence includes “the skills and knowledge needed for success in life, according to one’s own definition of success, within one’s own sociocultural context” (Sternberg, 2004, p. 326). Sternberg prefers the term successful intelligence to stress that intelligence as more than what is
TABLE 4.3

Sternberg’s Triarchic Theory of Intelligence

<table>
<thead>
<tr>
<th>Analytic</th>
<th>Creative</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Componental Intelligence</td>
<td>Experiential Intelligence</td>
<td>Contextual Intelligence</td>
</tr>
<tr>
<td><strong>Definition</strong></td>
<td>Ability to formulate new ideas and combine unrelated facts; creativity—ability to deal with novel situations and make new solutions automatic.</td>
<td>Ability to adapt to a changing environment and shape the environment to make the most of opportunities—problem solving in specific situations.</td>
</tr>
<tr>
<td><strong>Examples</strong></td>
<td>Diagnosing a problem with a car engine; finding resources for a new project.</td>
<td>Taking your telephone off the hook or putting a “do not disturb” sign on the door to limit distractions while studying.</td>
</tr>
</tbody>
</table>

Measured by mental abilities tests—intelligence is about success in life. As you might guess from the name, this theory has three parts—analytic, creative, and practical (see Table 4.3).

*Analytic/componental intelligence* involves the mental processes of the individual that lead to more or less intelligent behavior. These processes are defined in terms of components—elementary information processes that are classified by the functions they serve and by how general they are. *Metacomponents* perform higher-order functions such as planning, strategy selection, and monitoring. Executing the strategies selected is handled by *performance components*. Gaining new knowledge is performed by *knowledge-acquisition components*, such as separating relevant from irrelevant information as you try to understand a new concept (Sternberg, 1985).

Some components are specific; that is, they are necessary for only one kind of task, such as solving analogies. Other components are very general and may be necessary in almost every cognitive task. For example, metacomponents are always operating to select strategies and keep track of progress. This may help to explain the persistent correlations among all types of mental tests. People who are effective in selecting good problem-solving strategies, monitoring progress, and moving to a new approach when the first one fails are more likely to be successful on all types of tests. Metacomponents may be a modern-day version of Spearman’s g.

The second part of Sternberg’s triarchic theory, *creative/experiential intelligence*, involves coping with new experiences. Intelligent behavior is marked by two characteristics: (1) **insight**, or the ability to deal effectively with novel situations, and (2) **automaticity**—the ability to become efficient and automatic in thinking and problem solving. Thus, intelligence involves solving new problems as well as quickly turning new solutions into routine processes that can be applied without much cognitive effort.

The third part of Sternberg’s theory, *practical/contextual intelligence*, highlights the importance of choosing to live and work in a context where success is likely, adapting to that context, and reshaping it if necessary. Here, culture is a major factor in defining successful choice, adaptation, and shaping. For example, abilities that make a person successful in a rural farm community may be useless in the inner city or at a country club in the suburbs. People who are successful often seek situations in which their abilities will be valuable, then work hard to capitalize on those abilities and compensate for any weaknesses. Thus, intelligence in this third sense involves practical matters such as career choice or social skills. In a field study in a Russian city, Elena Grigorenko and Robert Sternberg (2001) found that adults with higher practical and analytical intelligence coped better both mentally and physically with the stresses caused by rapid changes in that part of the world.

Practical intelligence is made up mostly of action-oriented **tacit knowledge**. This tacit knowledge is more likely to be learned during everyday life than through formal schooling—it is “knowing how” rather than “knowing that” (Sternberg, Wagner, Williams, &
Measuring Intelligence

STOP THINK WRITE What is the capital of France? How are an inch and a mile alike? What does obstreperous mean? Repeat these numbers backwards: 8 5 7 3 0 2 1 9 7. In what two ways is a lamp better than a candle? If a suit sells for 1/2 of the regular price at $123, what was the original cost of the suit?

These items, taken from Sattler (2001, p. 222), are similar to the verbal questions from a common individual intelligence test for children. Another part of the test asks the child to tell what is missing in a picture, put pictures in order to tell a story, copy a design using blocks, assemble part of a puzzle, complete mazes, and copy symbols. Even though psychologists do not agree about what intelligence is, they do agree that intelligence, as measured by standard tests, is related to learning in school. Why is this so? It has to do in part with the way intelligence tests were first developed.

Binet’s Dilemma. In 1904, Alfred Binet was confronted with the following problem by the minister of public instruction in Paris: How can students who will need special instruction and extra help be identified early in their school careers, before they fail in regular classes? Binet was also a political activist, very concerned with the rights of children. He believed that having an objective measure of learning ability could protect students from poor families who might be forced to leave school because they were the victims of discrimination and assumed to be slow learners.

Binet and his collaborator Theodore Simon wanted to measure not merely school achievement, but the intellectual skill students needed to do well in school. After trying many different tests and eliminating items that did not discriminate between successful and unsuccessful students, Binet and Simon finally identified 55 tests, several for each age group from 3 to 13. Binet’s tests allowed the examiner to determine a mental age for a child. A child who succeeded on the items passed by most 6-year-olds, for example, was considered to have a mental age of 6, whether the child was actually 4, 6, or 8 years old.

The concept of intelligence quotient, or IQ, was added after Binet’s test was brought to the United States and revised at Stanford University to give us the Stanford-Binet test. An IQ score was computed by comparing the mental age score to the person’s actual chronological age. The formula was

\[ \text{Intelligence Quotient} = \frac{\text{Mental Age}}{\text{Chronological Age}} \times 100 \]

The early Stanford-Binet test has been revised five times, most recently in 2003 (Roid, 2003). The practice of computing a mental age has proven to be problematic because IQ scores calculated on the basis of mental age do not have the same meaning as children get older. To cope with this problem, the concept of deviation IQ was introduced. The deviation IQ score is a number that tells exactly how much above or below the average a person scored on the test, compared to others in the same age group, as you will see in the next section.

Group versus Individual IQ Tests. The Stanford-Binet is an individual intelligence test. It has to be administered to one student at a time by a trained psychologist and takes about two hours. Most of the questions are asked orally and do not require reading or writing. A student usually pays closer attention and is more motivated to do well when working directly with an adult.

Psychologists also have developed group tests that can be given to whole classes or schools. Compared to an individual test, a group test is much less likely to yield an
accurate picture of any one person's abilities. When students take tests in a group, they may do poorly because they do not understand the instructions, because they have trouble reading, because their pencils break or they lose their place on the answer sheet, because other students distract them, or because the answer format confuses them (Satler, 2001). As a teacher, you should be very wary of IQ scores based on group tests.

**What Does an IQ Score Mean?** Most intelligence tests are designed so that they have certain statistical characteristics. For example, the average score is 100, 50% of the people from the general population who take the tests will score 100 or above, and 50% will score below 100. About 68% of the general population will earn IQ scores between 85 and 115. Only about 16% will receive scores below 85, and only 16% will score above 115. Note, however, that these figures hold true for White, native-born Americans whose first language is Standard English. Whether IQ tests should even be used with ethnic minority-group students is hotly debated. The Guidelines below will help you interpret IQ scores realistically.

**The Flynn Effect: Are We Getting Smarter?** Ever since IQ tests were introduced in the early 1900s, scores in 20 different industrialized countries and in some more traditional cultures have been rising (Daley, Whaley, Sigman, Espinosa, & Neumann, 2003). In fact, in a generation, the average score goes up about 18 points on standardized IQ tests—maybe you really are smarter than your parents! This is called the Flynn effect after James Flynn, a political scientist who documented the phenomenon. Some explanations include better nutrition and medical care for children and parents, increasing complexity in the environment that stimulates thinking, smaller families who give more attention to their children, increased literacy of parents, more and better schooling, and better prepa-

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**Guidelines: Interpreting IQ Scores**

Check to see if the score is based on an individual or a group test. Be wary of group test scores.

**Examples:**

1. Individual tests include the Wechsler Scales (WPPSI, WISC-III, WAIS-III, WAIS Abbreviated), the Stanford-Binet, the McCarthy Scales of Children's Abilities, the Woodcock-Johnson Psycho-Educational Battery, the Kaufman Assessment Battery for Children, the Kaufman Adolescent and Adult Intelligence Test (KAIT), and the Das-Naglieri Cognitive Assessment System.

2. Group tests include the Cognitive Abilities Test (CogAT—formerly the Cognitive Intelligence Test), the Analysis of Learning Potential, the Kuhlman-Anderson Intelligence Tests, the Otis-Lennon School Abilities Test (formerly the Otis-Lennon Intelligence Test), and the School and College Ability Tests (SCAT).

Remember that IQ tests are only estimates of general aptitude for learning.

**Examples:**

1. Ignore small differences in scores among students.
2. Bear in mind that even an individual student's scores may change over time for many reasons, including measurement error.
3. Be aware that a total score is usually an average of scores on several kinds of questions. A score in the middle or average range may mean that the student performed at the average on every kind of question or that the student did quite well in some areas (for example, on verbal tasks) and rather poorly in other areas (for example, on quantitative tasks).

Remember that IQ scores reflect a student's past experiences and learning.

**Examples:**

1. Consider these scores to be predictors of school abilities, not measures of innate intellectual abilities.
2. If a student is doing well in your class, do not change your opinion or lower your expectations just because one score seems low.
3. Be wary of IQ scores for minority students and for students whose first language was not English. Even scores on “culture-free” tests are lower for students placed at risk.
4. Remember that both adaptive skills and scores on IQ tests are used to determine intellectual abilities and disabilities.

For more about interpreting IQ scores, see [https://www.wilderdom.com/personality/2.1UnderstandingIQ.html](https://www.wilderdom.com/personality/2.1UnderstandingIQ.html)
ration for taking tests. One result of the Flynn effect is that the norms used to determine scores (more about norms in Chapter 14) have to be continually revised. In other words, to keep a score of 100 as the average, the test questions have to be made more difficult. This increasing difficulty has implications for any program that uses IQ scores as part of the entrance requirements. For example, some “average” students of the previous generation now might be identified as having intellectual disabilities because the test questions are harder (Kanaya, Scullin, & Ceci, 2003).

**Intelligence and Achievement.** Intelligence test scores predict achievement in schools quite well, at least for large groups. For example, the correlation is about .4 to .5 between school grades and scores on a popular individual intelligence test, the revised Wechsler Intelligence Scale for Children (WISC-III). Correlations between standardized achievement test and intelligence test scores are higher, around .5 to .7 (Sattler, 2001). This isn’t surprising because the tests were designed to predict school achievement. Remember, Binet threw out test items that did not discriminate between good and poor students.

Do people who score high on IQ tests achieve more in life? Here, the answer is less clear. There is evidence that g, or general intelligence, correlates with “real-world academic, social, and occupational accomplishments” (Ceci, 1991), but there is great debate about the size and meaning of these correlations (Current Directions in Psychological Science, 1993; McClelland, 1995). People with higher intelligence test scores tend to complete more years of school and to have higher-status jobs. However, when the number of years of education is held constant, IQ scores and school achievement are not highly correlated with income and success in later life. Other factors such as motivation, social skills, and luck may make the difference (Goleman, 1995; Neisser et al., 1996; Sternberg & Wagner, 1993).

**Intelligence: Heredity or Environment?** Nowhere has the nature-versus-nurture debate raged so hard as in the area of intelligence. Should intelligence be seen as a potential, limited by our genetic makeup? Or does intelligence simply refer to an individual’s current level of intellectual functioning, as influenced by experience and education? In fact, it is almost impossible to separate intelligence “in the genes” from intelligence “due to experience.” Today, most psychologists believe that differences in intelligence are the result of both heredity and environment, probably in about equal proportions for children (Petrill & Wilkerson, 2000). “Genes do not fix behavior. Rather they establish a range of possible reactions to the range of possible experiences that the environment can provide” (Weinberg, 1989, p. 101). And environmental influences include everything from the health of a child’s mother during pregnancy to the amount of lead in the child’s home to the quality of teaching a child receives.

As a teacher, it is especially important for you to realize that cognitive skills, like any other skills, are always improvable. *Intelligence is a current state of affairs, affected by past experiences and open to future changes.* Even if intelligence is a limited potential, the potential is still quite large, and a challenge to all teachers. For example, Japanese and Chinese students know much more mathematics than American students, but their intelligence test scores are quite similar. This superiority in math probably is related to differences in the way mathematics is taught and studied in the three countries and to the self-motivation skills of many Asian students (Baron, 1998; Stevenson & Stigler, 1992).

Now that you have a sense of what intelligence means, let’s consider how to handle cognitive ability differences in teaching.

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**Ability Differences and Teaching**

**WHAT WOULD YOU SAY?**

You are interviewing for a job in a new middle school, scheduled to open this fall. After about 4 minutes of small talk, the curriculum supervisor says to you, “We have been having some heated debates in this district about ability grouping and tracking. Where do you stand on those issues?”
In this section, we consider alternatives for handling differences in academic ability. By the time you finish this section, you should have an answer to the question above. Is ability grouping a solution to the challenge of ability differences?

**Between-Class Grouping**

When whole classes are formed based on ability, the process is called *between-class ability grouping* or *tracking*, a common practice in secondary schools and some elementary schools as well. Although this seems on the surface to be an efficient way to teach, research has consistently shown that although segregation by ability may benefit high-achieving students, it causes problems for low-achieving students (Castle, Deniz, & Tortora, 2005; Garmon, Nystrand, Berends, & LePore, 1995; Committee on Increasing High School Students’ Engagement and Motivation to Learn, 2004; Oakes & Wells, 1998; Robinson & Climen, 1998).

Low-ability classes tend to receive lower-quality instruction in general. Teachers emphasize lower-level objectives and routine procedures, with less academic focus. Often, there are more student behavior problems and, along with these problems, increased teacher stress and decreased enthusiasm. These differences in instruction and the teachers’ negative attitudes may mean that low expectations are communicated to the students. Attendance may drop along with self-confidence. The lower tracks often have a disproportionately number of minority-group and economically disadvantaged students, so ability grouping, in effect, becomes segregation in school. Possibilities for friendships become limited to students in the same ability range. Assignments to classes are often made on the basis of group IQ tests instead of tests in the subject area itself. However, group IQ tests are not good guides for what someone is ready to learn in a particular subject area (Conno & Snow, 1986; Garmon, Nystrand, Berends, & LePore, 1995; Kulik & Kulik, 1982; Slavin, 1990).

Recently, there has been a movement for *untracking*, or teaching all students in mixed-ability groups, but providing extra help for those who struggle and enrichment for those who learn quickly (Conno, 1995a; Oakes & Wells, 2002). Jeannie Oakes and Amy Wells (2002) described several different ways to teach effectively in secondary schools without tracking:

- Eliminate remedial courses and have one regular and one advanced track.
- Offer honors assignment options or challenge pull-out activities within each course.
- Require all students to take a common core of classes, then allow self-selection into advanced classes after the core.
- Encourage minority-group students to enroll in advanced placement courses.
- Provide additional times during intercessions when struggling students can get extra help.
- Providing tutoring before and after school.
- Staff a homework help center with teachers, parents, and community volunteers.
- Instead of “dumbing down” content, teach students learning strategies for dealing with difficult material.

Not everyone agrees that untracking is a good idea. This movement has been more successful at the elementary level than it has been at the secondary level. The *Point/Counterpoint* looks at both sides.

There are two exceptions to the general finding that between-class ability grouping leads to lower achievement. The first is found in honors or gifted classes, where high-ability students tend to perform better than comparable students in regular classes (Kulik & Kulik, 1997). In the *Joplin Plan*, students stay in their regular, mixed-ability grade-level classes, but are regrouped across grade levels for reading. A reading group might therefore have students from several grades, all working on the same reading level.

**Within-Class and Flexible Grouping**

STOP THINK WRITE. You are preparing a unit on habitats for your students. You decide to do as your old educational psychology professor recommended and give an alternate form of the final unit test as a pretest to find out what the students already know about the subject. After you reassure them that the test won’t be graded—you just want an idea about
Point/Counterpoint

Is Tracking an Effective Strategy?

Tracking students into different classes or streams (college prep, vocational, remedial, gifted, etc.) has been standard procedure in many schools for a long time, but does it work? Critics say tracking is harmful, while supporters claim it is useful, even though it presents challenges.

**Point** Tracking is harmful and should be eliminated.

According to Tom Loveless, writing in the April 1999 issue of *Educational Leadership,* "Prominent researchers and prestigious national reports have argued that tracking has gone too far in the way of equal educational opportunity (p. 26)."

Loveless goes on to cite the work of Braddeck and Shinn (1995), Carnegie Council on Adolescent Development (1995), Oakes (1985) and Wheelock (1992)—all of whom make the argument against tracking. What is the basis for these claims? Surprisingly, the evidence is not clear or direct. For example, a few well-done and carefully designed studies found that tracking increases the gap between high and low achievers by depresssing the achievement of low-track students and boosting the achievement of high-track students. (Garment, 1987; Katchoff, 1986). And Garment also found that the achievement gap between low- and high-track students is greater than the gap between students who drop out of school and students who graduate. Because low-income students and students of color are overrepresented in the lower tracks, they suffer the greatest harm from tracking and should benefit the most from the elimination of tracking. (Oakes, 1990b; Oakes & Wells, 2002). Is this likely?

**Counterpoint** Eliminating tracking will hurt many students.

Researchers who have looked closely at tracking believe that tracking may be harmful for some students some of the time, but not for all students and not all of the time. First, as most people agree, tracking seems to have positive effects for the high-track students. Gifted programs, honors classes, and advanced placement classes seem to work. (Fuchs, Fuchs, Hamlett, & Karr, 1998; Robinson & Clinkenbeard, 1998). No one, especially parents, wants to eliminate the positive effects of these programs. And the chance of being assigned to a high track is 10% greater for African American students (Gallaher & Mays, 1989), so detacking could be a special disservice to these students.

What would happen if schools were detacked? Loveless (1999) identifies some possible hidden costs. First, results of a large national study suggest that when low-track 10th graders are assigned to heterogeneous classes rather than low-tracks, they gain about 5 percentage points in achievement. So far, so good. But average students lose 2 percentage points when put into heterogeneous classes and high-track students lose about 5 points.

The achievement gap is indeed narrowed, but apparently at the expense of students in regular and high tracks representing about 70% of 10th graders in the United States (Loveless, 1999, p. 29). Another consequence of detacking is bright flight—the withdrawal of the brightest students from the school. Both African American and White parents distrust mixed-ability classes to meet the needs of their children (Public Agenda Foundation, 1994).

In some classes, using a mixed-ability structure seems to hinder the achievement of all students. For example, students in heterogeneous algebra classes don’t learn as much as students in tracked classes—all other things being equal. (Loveless, 1999). And a meta-analysis of student self-esteem found that students in low-track classes did not have lower self-esteem than students in heterogeneous classes (Krisk & Krik, 1997).

So what is the answer? As usual, it is more complicated than simply detacking versus tracking. Careful attention to every student’s achievement may mean different answers at different times.

**What Do You Think?**

Vote online at www.mylabschool.com

where to go in developing the lesson—the students settle in and seem to take the task seriously. Looking over the papers that night, you are dismayed. A quarter of the students make over 90% on the "final." Quite a few get around half of the questions and problems right, but the rest of the class is clueless. The next day, when you ask Shamequa why she did so well on the test, she explains that in science class last year her group (and several others) chose habitats as the focus of their special project work. You stare at your lesson plans and realize that they fit practically no one in this class. What will you do?  ■

Differences like the ones illustrated above are common in most schools and classrooms. It is not unusual to have 3- to 5-year differences in any given classroom (Castle,
Deniz, & Tortora, 2005). But even if you decided to simply forge ahead and teach the same material in the same way to your entire class, you would not be alone. One study found that in 46 different classrooms, 84% of the activities were the same for high-achieving and average-achieving students (Westberg, Archambault, Dobyns, & Slavin, 1993). Differences in student prior knowledge are a major challenge for teachers, especially in subjects that build on previous knowledge and skills such as math and science (Loveless, 1998).

Today, many elementary-school classes are grouped for reading, and some are grouped for math, even though there is no clear evidence that this within-class ability grouping is superior to other approaches. Thoughtfully constructed and well-taught ability groups in math and reading can be effective, but other approaches such as cooperative learning are available, too. The point of any grouping strategy should be to provide appropriate challenge and support—that is, to reach children within their “zone of proximal development” (Vygotsky, 1977). Flexible grouping is one possible answer.

Flexible Grouping. In flexible grouping, students are grouped and regrouped based on their learning needs. Assessment is continuous so that students are always working within their zone of proximal development. Arrangements might include small groups, partners, individuals, and even the whole class—depending on which grouping best supports each student’s learning of the particular academic content. Flexible grouping approaches often include high-level instruction and high expectations for all students, no matter what their group placement. One 5-year longitudinal study of flexible grouping in a high-needs urban elementary school (Castle, Denis, & Tortora, 2005) found 10% to 57% increases in students who reached mastery level, depending on the subject area and grade level. Teachers received training and support in the assessment, grouping, and teaching strategies needed, and by the end of the study, 95% of the teachers were using flexible grouping. The teachers in the study believed that some of the gains came because students were more focused on learning and more confident.

Another way to use flexible grouping is the nongraded elementary school. Students of several ages (for example, 6, 7, and 8) are together in one class, but they are flexibly grouped within the class for instruction based on achievement, motivation, or interest in different subjects. This cross-grade grouping seems to be effective for students of all abilities as long as the grouping allows teachers to give more direct instruction to the group. But be sensitive about cross-age grouping. Mixing 3rd, 4th, and 5th graders for math or reading class based on what they are ready to learn makes sense. However, sending a large 4th grader to the 2nd grade, where he is the only older student and stands out like a sore thumb, isn’t likely to work well. Also, when cross-age classes are created just because there are too few students for one grade—and not in order to better meet the students’ learning needs—the results are not positive (Veenman, 1997). As we will see repeatedly throughout this text, working at a challenging level, but one you can master with effort and support, is more likely to encourage learning and motivation.

If you ever decide to use ability grouping in your class, the Guidelines should make the approach more effective (Good & Brophy, 2003).

Learning Styles

**What would you say?**

During your interview for a teaching job, the department chair says, “We are thinking about having a professional development program on learning styles. What do you know about that idea?”

The way a person approaches learning and studying is his or her learning style. Although many different learning styles have been described, one theme that unites most of the
**Guidelines:** Grouping by Achievement

Form and reform groups on the basis of students’ current performance in the subject being taught.

**Examples:**

1. Use scores on the most recent reading assessments to establish reading groups, and rely on current math performance to form math groups.
2. Change group placement frequently when students’ achievement changes.

Discourage comparisons between groups and encourage students to develop a whole-class spirit.

**Examples:**

1. Don’t seat groups together outside the context of their reading or math group.
2. Avoid naming ability groups—save the names for mixed-ability or whole-class teams.

Group by ability for one or, at the most, two subjects.

**Examples:**

1. Make sure there are many lessons and projects that mix members from the groups.
2. Experiment with learning strategies in which cooperation is stressed (described in Chapter 11).

3. Keep the number of groups small (two or three at most) so that you can provide as much direct teaching as possible—leaving students alone for too long leads to less learning.

Make sure teachers, methods, and pace are adjusted to fit the needs of the group.

**Examples:**

1. Organize and teach groups so that low-achieving students get appropriate extra instruction—not just the same material again.
2. Experiment with alternatives to grouping. There are alternatives to within-class grouping that appear more effective for some subjects. DeWayne Mason and Tom Good (1993) found that supplementing whole-class instruction in math with remediation and enrichment for students when they needed it worked better than dividing the class into two ability groups and teaching these groups separately.

For more information about classroom grouping, see these two sites:
http://www.nagponline.org/information/poster_8g.html
http://www.wsr.org/sgp/ins1/76e12.html

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styles is the differences between deep and surface approaches to processing information in learning situations (Snow, Comto, & Jackson, 1996). Individuals who have a deep-processing approach see the learning activities as a means for understanding some underlying concepts or meanings. They tend to learn for the sake of learning and are less concerned about how their performance is evaluated, so motivation plays a role as well. Students who take a surface-processing approach focus on memorizing the learning materials, not understanding them. These students tend to be motivated by rewards, grades, external standards, and the desire to be evaluated positively by others. Of course, the situation can encourage deep or surface processing, but there is evidence that individuals have tendencies to approach learning situations in characteristic ways (Biggs, 2001; Goffield, Moseley, Hall, & Eccleston, 2004; Pintrich & Schrauben, 1992; Tigg & Entwistle, 1998).

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**Cautions about Learning Preferences**

Since the late 1970s, a great deal has been written about differences in students’ learning preferences (Dunn, Dunn, & Price, 2000; Dunn & Griggs, 2003; Greig, 1982; Keffe, 1982). Learning preferences are often called learning styles in these writings, but I believe preferences is a more accurate label because the “styles” are determined by your preferences for particular learning environments - for example, where, when, with whom, or with what lighting, food, or music you like to study. I like to study and write during large blocks of time—all day if I don’t have classes. I usually make some kind of commitment or deadline every week so that I have to work in long stretches to finish the work before that deadline. Then I take a day off. When I plan or think, I have to see my thinking in writing. I have a colleague who draws diagrams of

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**Connect and Extend to PRAXIS II**

Learning/Cognitive Styles (1, B1)

Familiarize yourself with the major issues involved with learning and cognitive styles, and understand their implications for classroom practice.

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Learning preferences: Preferred ways of studying and learning, such as using pictures instead of text, working with other people versus alone, learning in structured or unstructured situations, and so on.
relationships when she listens to a speaker or plans a paper. You may be similar or very different, but we all may work effectively. But are these preferences important for learning?

There are a number of instruments for assessing students' learning preferences: The Learning Style Inventory (Dunn, Dunn, & Price, 1989), Learning Styles Inventory Revised (Kolb, 1985), and the Learning Style Profile (Keeffe & Monk, 1986). But tests of learning style have been strongly criticized for lacking evidence of reliability and validity (Snider, 1990; Wintergerst, DeCapua, & Itzen, 2001). In fact, in an extensive examination of learning styles instruments, researchers at the Learning Skills Research Centre in England concluded, "with regard to Dunn and Dunn (Section 3.2), Gregorec (Section 3.1) and Riding (Section 4.1), our examination of the reliability and validity of their learning style instruments strongly suggests that they should not be used in education or business" (Coffield, et al., 2004, p. 127).

Some proponents of learning styles believe that students learn more when they study in their preferred setting and manner (Dunn, Beaudry, & Klavas, 1989; Lovelace, 2005). And there is evidence that very bright students need less structure and prefer quiet, solitary learning (Torrance, 1986). But most educational psychologists are skeptical about the value of learning preferences. "The reason researchers roll their eyes at learning styles research is the utter failure to find that assessing children's learning styles and matching to instructional methods has any effect on their learning" (Stahl, 2002, p. 99). Why are these ideas so popular? Part of the answer is, "A thriving commercial industry has also been built to offer advice to teachers, tutors and managers on learning styles, and much of it consists of inflated claims and sweeping conclusions which go beyond the current knowledge base and the specific recommendations of particular theorists" (Coffield et al., 2004, p. 127). Some of the teaching ideas may be useful, but not necessarily because they are based on learning styles.

So, before you try to accommodate all your students' learning styles, remember that students, especially younger ones, may not be the best judges of how they should learn. Sometimes, students, particularly those who have difficulty, prefer what is easy and comfortable; real learning can be hard and uncomfortable. Sometimes, students prefer to learn in a certain way because they have no alternatives; it is the only way they know how to approach the task. These students may benefit from developing new—and perhaps more effective—ways to learn. One final consideration: Many of the learning styles advocates imply that the differences in the learner are what matter. But recent research points to the person in context—the entire teaching-learning system as a better way to understand student learning (Coffield et al., 2004). We will examine this again in the next chapter when we consider culture and learning style.

Visual/Verbal Distinctions

There is one learning styles distinction that has research support. Richard Mayer has been studying the distinction between visual and verbal learners, with a focus on learning from computer-based multimedia. He is finding that there is a visualizer-verbalerizer dimension and that it has three facets: cognitive spatial ability (low or high), cognitive style (visualizer vs. verbalizer), and learning preference (verbal learner vs. visual learner), as shown in Table 4.4 (Mayer & Massa, 2003). The picture is more complex than simply categorizing a student as either a visual or a verbal learner. Students might have preferences for learning with pictures, but their low spatial ability could make using pictures to learn less effective. These differences can be reliably measured, but research has not identified the effects of teaching to these styles. Certainly, presenting information in multiple modalities might be useful.

The Value of Considering Learning Styles. Even though much of the work on matching learning styles and preferences to teaching is suspect, with unreliable measures and inflated claims, there is some value in thinking about learning styles. First, by helping students think about how they learn, you can develop thoughtful self-monitoring and self-awareness. In upcoming chapters, we will look at the value of such self-knowledge for

Connect and Extend to Your Teaching Portfolio:

When students fail a grade or a course, they are often "rejected" through the same material on the assumption that repetition will produce learning. Use the concept of cognitive style to argue against this practice.
TABLE 4.4

Three Facets of the Visualizer-Verbalizer Dimension

There are three dimensions to visual versus verbal learning ability, style, and preference. Individuals can be high or low on any of all of these dimensions.

<table>
<thead>
<tr>
<th>Facet</th>
<th>Types of Learners</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Ability</td>
<td>High spatial ability</td>
<td>Good abilities to create, remember, and manipulate images and spatial information</td>
</tr>
<tr>
<td></td>
<td>Low spatial ability</td>
<td>Poor abilities to create, remember, and manipulate images and spatial information</td>
</tr>
<tr>
<td>Cognitive Style</td>
<td>Visualizer</td>
<td>Thinks using images and visual information</td>
</tr>
<tr>
<td></td>
<td>Verbalizer</td>
<td>Thinks using words and verbal information</td>
</tr>
<tr>
<td>Learning Preference</td>
<td>Visual learner</td>
<td>Prefers instruction using pictures</td>
</tr>
<tr>
<td></td>
<td>Verbal learner</td>
<td>Prefers instruction using words</td>
</tr>
</tbody>
</table>


learning and motivation. Second, looking at individual students' approaches to learning might help teachers appreciate, accept, and accommodate student differences (Goffie, et al., 2004; Rosenfeld & Rosenfeld, 2004).

Thus far, we have focused mostly on the varying abilities and styles of students. For the rest of the chapter, we will consider what can interfere with learning. It is important for all teachers to be aware of these issues because laws and policy changes over the past 30 years have expanded teachers' responsibilities in working with all students.

Individual Differences and the Law

STOP THINK WRITE. Have you ever had the experience of being the only one in a group who had trouble doing something? How would you feel if every day in school you faced the same kind of difficulty, while everyone else seemed to find the work easier than you? What kind of support and teaching would you need to keep trying?

In the United States, beginning in 1975 with PL 94-142 (the Education of the Handicapped Act), a series of laws has led to revolutionary changes in the education of children with disabilities. The legislation, now called the Individuals with Disabilities Education Improvement Act, was revised in 1990, 1997, and 2004. You may see this law called IDEA or IDEIA. At the most general level, the law requires states to provide a free, appropriate public education (FAPE) for all students with disabilities who participate in special education. There are no exceptions—the law requires zero reject. This policy also applies to students with communicable diseases such as AIDS. The expenses of meeting the special needs of these students is considered a public responsibility. Let's examine the requirements in these laws. There are three major points of interest to teachers: the individualized education program (IEP), the protection of the rights of students with disabilities and their parents, and the concept of "least restrictive environment."

Individualized Education Program

The drafters of the laws recognized that each student is unique and may need a specially tailored program to make progress. The Individualized Education Program, or IEP, is an agreement between parents and the school about the services that will be provided.
The IEP is written by a team that includes the student’s parents or guardians, a general education teacher who works with the student, a special education teacher, a qualified school representative who can interpret the student’s evaluation results, and (if appropriate) the student. If the school and parents agree, the team could add other people who have special knowledge of the child (for example, a therapist). The program can be updated each year and must state in writing:

1. The student’s present academic achievement and functional performance.
2. Measurable performance goal for the year. Parents must get reports of progress toward goals at least as often as report cards are sent home for all students.
3. A statement of specific special education and related services to be provided to the student and details of when those services will be initiated.
4. A statement of how much of the student’s program WILL NOT be in regular classroom and school settings.
5. A statement about how the student will participate in the state- and district-wide assessments, particularly those required by No Child Left Behind.
6. Beginning at age 14 and by age 16, a statement of needed transitional services to move the student toward further education or work in adult life.

Figure 13.3 on page 512 (Chapter 13) is a excerpt from the IEP of a 15-year-old boy with behavior problems.

The Rights of Students and Families

Several stipulations in these laws protect the rights of parents and students. Schools must have procedures for maintaining the confidentiality of school records. Testing practices must not discriminate against students from different cultural backgrounds. Students must be tested in their native or primary language whenever possible. Parents must consent in writing to the initial evaluation of their child and to the child’s special education program. Parents have the right to see all records relating to the testing, placement, and teaching of their child. If they wish, parents may obtain an independent evaluation of their child. Parents may bring an advocate or representative to the meeting at which the IEP is developed. Students whose parents are unavailable must be assigned a surrogate parent to participate in the planning. Parents must receive written notice (in their native language) before any evaluation or change in placement is made. Finally, parents have the right to challenge the program developed for their child, and are protected by due process of law. If you have conferences with your student’s family, following the suggestions in the Family and Community Partnerships Guidelines can make the meetings more effective.

Least Restrictive Environment

The laws require states to develop procedures for educating each child in the least restrictive environment (LRE)—with their peers in the regular classroom to the greatest extent possible. Therefore, a student’s IEP must reflect that the student is being educated in the least restrictive environment appropriate for the student’s needs. Over the years, recommended approaches to achieve this have moved from mainstreaming (including children with special needs in a few regular education classes as convenient), to integration (fitting the child with special needs into existing class structures), to inclusion (restructuring educational settings to promote belonging for all students) (Avramidis, Bayliss, & Burden, 2000; Friend & Bursuck, 2002).

Advocates of inclusion believe that students with disabilities can benefit from involvement with their nondisabled peers and should be educated with them in their regular home–district school, even if doing so means changes in educational requirements, special aids, services, and training or consultation for the regular teaching staff (Haager & Klingner, 2005; Stainback & Stainback, 1992). However, some
Family and Community Partnerships

Guidelines: Productive Conferences

Plan and prepare for a productive conference.

**EXAMPLES:**

1. I have a clear purpose and gather the needed information. If you want to discuss student progress, have work samples available.
2. Send home a list of questions and ask families to bring the information to the conference. Sample questions from Friend and Burns (2002) are:
   - What is your child's favorite class activity?
   - Does your child have worries about any class activities? if so, what are they?
   - What are your priorities for your child's education this year?
   - What questions do you have about your child's education in my class this year?
   - How could we at school help make this the most successful year ever for your child?
   - Are there any topics you want to discuss at the conference that I might need to prepare for? If so, please let me know.
   - Would you like other individuals to participate in the conference? If so, please give me a list of their names.
   - Is there particular school information you would like me to have available? If so, please let me know.

During the conference, create and maintain an atmosphere of collaboration and respect.

**EXAMPLES:**

1. Arrange the room for private conversation. Put a sign on your door to avoid interruptions. Meet around a conference table for better collaboration. Have tissues available.
2. Address families as “Mr.” and “Ms.”, not “Mom” and “Dad” or “Grandma.” Use students’ names.
3. Listen to families’ concerns and build on their suggestions for their children.

After the conference, keep good records and follow up on decisions.

**EXAMPLES:**

1. Make notes to yourself and keep them organized.
2. Summarize any actions or decisions in writing and send a copy to the family and any other teachers or professionals involved.
3. Communicate with families on other occasions, especially when there is good news to share.

For more information about parent conferences, see:
http://teacher.scholastic.com/professional/parentconf/

researchers caution that inclusion classrooms are not the best placement for every child (Johnson, Duffett, Farkas, & Wilson, 2002). For example, Naomi Zigmond and her colleagues (1995) report in their study of 6 full-inclusion elementary schools that only about half of the students with learning disabilities were able to benefit. A full continuum of services must be available so that students are taught using effective practices in an appropriate setting, which could be anything from full to partial inclusion to special schools.

**Section 504 Protections**

Not all students who need special accommodations in school are covered by IDEIA or eligible for the services provided by the law. But these students’ educational needs may be covered by other legislation. As a consequence of the civil rights movement in the 1960s and 1970s, the federal government passed the Vocational Rehabilitation Act of 1973. Section 504 of that law prevents discrimination against people with disabilities in any program that receives federal money, such as public schools.

Through Section 504, all school-age children are ensured an equal opportunity to participate in school activities. The definition of “disability” is broad in Section 504. If a student has a condition that substantially limits participation in school, then the school still must develop a plan for giving that student access to education, even through the school gets no extra funds. To get assistance through Section 504, students must be assessed, often by a team, and a plan developed. Unlike IDEIA, however, there are fewer rules about how this must happen, so individual schools design their own procedures.
The types of accommodations that can be written into a Section 504 plan are almost without limit. Some accommodation may relate to physical changes in the learning environment (for example, air filters are installed to remove allergens). However, many students who have Section 504 plans have functional impairments related to their learning or behavior, and their needs are somewhat similar to those of students with disabilities. The following is a sample of instructional accommodations that could be incorporated into a Section 504 plan:

- Seat the student nearest to where the teacher does most of his/her instruction.
- Have the student sit next to a peer who can help as needed.
- Seat the student away from the distractions of doorways or windows.
- Fold assignments in half so that the student is less overwhelmed by the quantity of work.
- Make directions telegraphic, that is, concise and clear.
- Allow use of a calculator or tape recorder.
- Use voice recognition software on the computer for written assignments.
- Mark right answers instead of wrong answers.
- Send a set of textbooks to be left at home so that the student does not have to remember to bring books from school.
- Provide books on tape so that the student can listen to assignments instead of reading them.

If you review these items, you can see that many of them just make good instructional sense. They are effective instructional practices that help learners with special needs succeed in your classroom.

Source: From Including Students with Special Needs: A Practical Guide for Classroom Teachers, 3/e by Marilyn Friend & William D. Bursuck. Published by Allyn and Bacon, Boston, MA. Copyright © 2002 by Pearson Education. Adapted by permission of the publisher.

(Friend & Bursuck, 2002). Look at Table 4.5 to see an example of the kinds of accommodations that might be made for a student. Many of these ideas seem to be “just good teaching.” But I have been surprised to see how many teachers won’t let students use calculators or tape recorders because “they should learn it like everyone else!” Two major groups are considered for Section 504 accommodations: students with medical or health needs such as diabetes, drug addiction, severe allergies, communicable diseases, temporary disabilities resulting from accidents, or alcoholism, and students with attention deficit hyperactivity disorder, if they are not already covered by IDEA.

The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination against persons with disabilities in employment, transportation, public access, local government, and telecommunications. This comprehensive legislation extends the protections of Section 504 beyond the school and workplace to libraries, local and state government, restaurants, hotels, theaters, stores, public transportation, and many other settings.

We turn now to the challenges your students may face.

Common Challenges

Look at Table 4.6. You will see that almost 3 million students served under IDEA have specific learning disabilities and another 1 million have speech and language impairments. If you add children with intellectual disabilities (labeled “mental retardation” in Table 4.6) and students with emotional problems, that totals almost 90% of the students served. With recent changes in the laws and new, more inclusive policies, you are likely to have children from all these categories in your classes.

About one-half of all students receiving some kind of special-education services in the public schools are diagnosed as having learning disabilities—by far the largest category of students with disabilities.

Chapter 4: Learner Differences and Learning Needs
### Table 4.6

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific learning disabilities</td>
<td>2,247,004</td>
<td>2,897,217</td>
<td>28.5</td>
</tr>
<tr>
<td>Speech or language impairments</td>
<td>998,904</td>
<td>1,093,808</td>
<td>9.5</td>
</tr>
<tr>
<td>Mental retardation</td>
<td>553,262</td>
<td>612,978</td>
<td>10.8</td>
</tr>
<tr>
<td>Emotional disturbance</td>
<td>400,211</td>
<td>473,663</td>
<td>18.4</td>
</tr>
<tr>
<td>Multiple disabilities</td>
<td>98,408</td>
<td>122,559</td>
<td>24.5</td>
</tr>
<tr>
<td>Hearing impairments</td>
<td>60,727</td>
<td>70,767</td>
<td>16.5</td>
</tr>
<tr>
<td>Orthopedic impairments</td>
<td>51,389</td>
<td>73,057</td>
<td>42.2</td>
</tr>
<tr>
<td>Other health impairments</td>
<td>58,749</td>
<td>291,850</td>
<td>398.8</td>
</tr>
<tr>
<td>Visual impairments</td>
<td>24,083</td>
<td>25,975</td>
<td>7.9</td>
</tr>
<tr>
<td>Autism</td>
<td>5,415</td>
<td>78,749</td>
<td>1,354.3</td>
</tr>
<tr>
<td>Deaf-blindness</td>
<td>1,427</td>
<td>1,320</td>
<td>-7.5</td>
</tr>
<tr>
<td>Traumatic brain injury</td>
<td>245</td>
<td>14,844</td>
<td>5,958.8</td>
</tr>
<tr>
<td>Developmental delay</td>
<td>—</td>
<td>28,935</td>
<td>—</td>
</tr>
<tr>
<td>All disabilities</td>
<td>4,499,824</td>
<td>5,775,722</td>
<td>28.4</td>
</tr>
</tbody>
</table>


---

### Students with Learning Disabilities

How do you explain a student who struggles to read, write, spell, or learn math, even though he or she does not have intellectual disabilities, emotional problems, or educational disadvantages and has normal vision, hearing, and language capabilities? One explanation is that the student has a learning disability. This is a relatively new and controversial category of exceptional students. There is no fully agreed-upon definition. A recent text on learning disabilities describes 8 definitions (Hallahan et al., 2005), including the definition used in IDEA: “a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written” (p. 15). Most definitions agree that students with learning disabilities perform significantly below what would be expected, given their other abilities.

In 2001, the U.S. Department of Education Office of Special Education convened a summit meeting on learning disabilities. A definition of specific learning disabilities (SLD) that emerged from that meeting is:

> The central concept of SLD involves disorders of learning and cognition that are intrinsic to the individual. SLD are specific in the sense that these disorders each significantly affect a relatively narrow range of academic and performance outcomes. SLD may occur in combination with other disabling conditions, but they are not due primarily to other conditions, such as mental retardation, behavioral disturbance, lack of opportunities to learn, or primary sensory deficits. (Bradley, Danielson, & Hallahan, 2002, p. 792)

Some educators and psychologists believe the learning disability label is overused and abused. They suggest that many of the students called learning disabled are really slow learners in average schools, average learners in high-achieving schools, students with

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**Connect and Extend to the Research**

The January 2004 issue of The Elementary School Journal is edited by Russell Gersten and Sharon Vaughn and is entirely devoted to "Instructional Interventions for Students with Learning Disabilities." Topics include teaching writing, literacy, self-concept, and higher-order learning.

**Learning disability.** Problem with acquisition and use of language; may show up as difficulty with reading, writing, reasoning, or math.
second-language problems, or students who are behind in their work because they have been absent frequently or have changed schools often (Finlan, 1994).

**Student Characteristics.** Students with learning disabilities are not all alike. The most common characteristics are specific difficulties in one or more academic areas, poor coordination; problems paying attention; hyperactivity and impulsivity; problems organizing and interpreting visual and auditory information; disorders of thinking, memory, speech, and hearing; and difficulties making and keeping friends (Hallahan & Kauffman, 2006; Hunt & Marshall, 2002). As you can see, many students with other disabilities (such as attention-deficit disorder) and many normal students may have some of the same characteristics. To complicate the situation even more, not all students with learning disabilities will have these problems, and few will have all of the problems. One student may be 3 years behind in reading but above grade level in math, while another student may have the opposite strengths and weaknesses and a third may have problems with organizing and studying that affect almost all subject areas.

Most students with learning disabilities have difficulties reading. Table 4.7 lists some of the most common problems, although these problems are not always signs of learning disabilities. These difficulties appear to be caused by problems with relating sounds to letters that make up words, making spelling hard as well (Stanovich, 1994; Willcutt et al., 2001).

Math, both computation and problem-solving, is the second most common problem area for students with learning disabilities. The writing of some of these students is virtually unreadable, and their spoken language can be halting and disorganized. Students

### Table 4.7

**Reading Habits and Errors of Students with Learning Disabilities**

<table>
<thead>
<tr>
<th>Poor Reading Habits</th>
<th>Word Recognition Errors</th>
<th>Comprehension Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently loses his or her place</td>
<td>Omitting a word (e.g., “He came to the park.”) is read, “He came to park”)</td>
<td>Recalling basic facts (e.g., cannot answer questions directly from a passage)</td>
</tr>
<tr>
<td>Jerks head from side to side</td>
<td>Inserting a word (e.g., “He came to the [beautiful] park”)</td>
<td>Recalling sequence (e.g., cannot explain the order of events in a story)</td>
</tr>
<tr>
<td>Expresses insecurity by crying or refusing to read</td>
<td>Substituting a word for another (e.g., “He came to the pond”)</td>
<td>Recalling main theme (e.g., cannot give the main idea of a story)</td>
</tr>
<tr>
<td>Prefers to read with the book held within inches from face</td>
<td>Reversing letters or words (e.g., was is read saw)</td>
<td></td>
</tr>
<tr>
<td>Shows tension while reading, such as reading in a high-pitched voice, biting lips, and fidgeting</td>
<td>Mispronouncing words (e.g., park is read park)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transposing letters or words (e.g., “The dog ate fast,” is read, “The dog fast ate”)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not attempting to read an unknown word by breaking it into familiar units</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slow, laborious reading, less than 20 to 30 words per minute</td>
<td></td>
</tr>
</tbody>
</table>

with learning disabilities often lack effective ways of approaching academic tasks. They don’t know how to focus on the relevant information, get organized, apply learning strategies and study skills, change strategies when one isn’t working, or evaluate their learning. They tend to be passive learners, in part because they don’t know how to learn. Working independently is especially trying, so homework and seatwork are often left incomplete (Hallahan et al., 2005).

Early diagnosis is important so that students with learning disabilities do not become terribly frustrated and discouraged. The students themselves do not understand why they are having such trouble, and they may become victims of learned helplessness. This condition was first identified in learning experiments with animals. The animals were put in situations where they received punishment (electric shocks) that they could not control. Later, when the situation was changed and they could have escaped the shocks or turned them off, the animals didn’t even bother trying (Seligman, 1975). They had learned to be helpless victims. Students with learning disabilities may also come to believe that they cannot control or improve their own learning. This is a powerful belief. The students never exert the effort to discover that they can make a difference in their own learning, so they remain passive and helpless.

Students with learning disabilities may also try to compensate for their problems and develop bad learning habits in the process, or they may begin avoiding certain subjects out of fear of not being able to handle the work. To prevent these things from happening, the teacher should refer the students to the appropriate professionals in the school as early as possible.

Teaching Students with Learning Disabilities. There is also controversy over how best to help these students. A promising approach seems to be to emphasize study skills and methods for processing information in a given subject such as reading or math. Many of the principles of cognitive learning from Chapters 7 and 8 can be applied to help all students improve their attention, memory, and problem-solving abilities (Sawyer, Graham, & Harris, 1992). Here are some general strategies taken from Hardman, Drew, and Fegan (2005):

Preschool years

Keep verbal instructions short and simple.
Match the level of content carefully to the child’s developmental level.
Give multiple examples to clarify meaning.
Allow more practice than usual, especially when material is new.

Learned helplessness. The expectation, based on previous experiences with a lack of control, that all one’s efforts will lead to failure.
Elementary School Years
Keep verbal instructions short and simple; have students repeat directions back to you to be sure they understand.
Use mnemonics (memory strategies) in instruction to teach students how to remember.
Repeat main points several times.
Provide additional time for learning and practice—re-teach when necessary.

Secondary School and Transition Years
Directly teach self-monitoring strategies, such as asking students to ask, “Was I paying attention?”
Connect new material to knowledge students already have.
Teach students to use external memory strategies and devices (tape-recording, notetaking, to-do lists, etc.).

You may be thinking that these are good ideas for many students who need more support and direct teaching of study skills. You are right.

In teaching reading, a combination of teaching letter-sound (phonological) knowledge and word identification strategies appears to be effective. For example, Maureen Lovett and her colleagues (Lovett et al., 2000) in Canada taught students with severe reading disabilities to use the four different word identification strategies: (1) identifying words by analogy, (2) seeking the part of the word that you know, (3) attempting different vowel pronunciations, and (4) “peeling off” prefixes and suffixes in a multisyllabic word. Teachers worked one-on-one with the students to learn and practice these four strategies, along with analysis of word sounds and blending sounds into words (phonological knowledge). Direct teaching of skills and strategies is especially important for students with reading disabilities.

Students with Hyperactivity and Attention Disorders

STOP THINK WRITE: If a student is struggling with time management and organization issues, what kind of accommodations would you provide?

You probably have heard and may even have used the term “hyperactivity.” The notion is a modern one; there were no hyperactive children 50 or 60 years ago. Such children, like Mark Twain’s Huckleberry Finn, were seen as rebellious, lazy, or “fidgety” (Nylund, 2000). Today, if anything, the term is applied too often and too widely. Many student teachers in my program have classes that include 5 or 6 students diagnosed as “hyperactive,” and in one class, there are 10 students with that diagnosis. Actually, hyperactivity is not one particular condition, but two kinds of problems that may or may not occur together—attention disorders and impulsive-hyperactivity problems.

Definitions: Today, most psychologists agree that the main problem for children labeled hyperactive is directing and maintaining attention, not simply controlling their physical activity. The American Psychiatric Association has established a diagnostic category called attention-deficit hyperactivity disorder (ADHD) to identify children with this problem. Table 4.8 lists some indicators of ADHD used by this group.

Children with ADHD are not only more physically active and inattentive than other children, they also have difficulty responding appropriately and working steadily toward goals (even their own goals). In addition, they may not be able to control their behavior on command, even for a brief period. The problem behaviors are generally evident in all situations and with every teacher. It is difficult to know how many children should be classified as hyperactive. The most common estimate is 3% to 5% of the elementary school population, with over half of these students having the combined attention and hyperactivity conditions (Hardman et al., 2005; Sagvolden, 1999). About 3 to 4 times more boys than girls are identified as hyperactive, but the gap appears to be narrowing (Hallahan et al., 2003). Just a few years ago, most psychologists thought that ADHD diminished as children entered adolescence, but now there are some researchers who believe that the problems can persist into adulthood (Hallowell & Ratey, 1994). Adolescence—with the increased stresses of puberty, transition to middle or high school, more demanding aca-
### TABLE 4.8

**Indicators of ADHD: Attention-Deficit Hyperactivity Disorder**

Do any of your students show these traits? They could be indicators of ADHD.

<table>
<thead>
<tr>
<th>Problems with Inattention</th>
<th>Problems with Impulse Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Often does not give close attention to details or makes careless mistakes</td>
<td>• Often blurts out answers before questions have been completed</td>
</tr>
<tr>
<td>• Has trouble keeping attention in tasks or play activities</td>
<td>• Has trouble awaiting his/her turn</td>
</tr>
<tr>
<td>• Does not seem to listen when spoken to directly</td>
<td>• Often interrupts or intrudes on others in conversations or games</td>
</tr>
<tr>
<td>• Does not follow through on instructions and fails to finish schoolwork (not due to oppositional behavior or failure to understand instructions)</td>
<td></td>
</tr>
<tr>
<td>• Has difficulty organizing tasks or activities</td>
<td></td>
</tr>
<tr>
<td>• Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)</td>
<td></td>
</tr>
<tr>
<td>• Loses things necessary for tasks or activities</td>
<td></td>
</tr>
<tr>
<td>• Is easily distracted by extraneous stimuli</td>
<td></td>
</tr>
<tr>
<td>• Is forgetful in daily activities</td>
<td></td>
</tr>
</tbody>
</table>

**Hyperactivity**

- Often fidgets with hands or feet or squirms in seat
- Often gets up from seat when remaining seated is expected
- Often runs around or climbs excessively in situations in which it is inappropriate (in adolescents may be limited to subjective feelings of restlessness)
- Often has difficulty playing or engaging in leisure activities quietly
- Often talks excessively
- Often acts as if ‘driven by a motor’ and cannot remain still


Academic work, and more engaging social relationships—can be an especially difficult time for students with ADHD (Taylor, 1998).

**Treating and Teaching Students with ADHD.** Today, there is an increasing reliance on drug therapy for ADHD. In fact, from 1990 to 1998, there was a 700% increase in the production of Ritalin in the United States (Diller, 1998). Ritalin and other prescribed drugs such as Adderall and Cylert are stimulants, but in particular dosages, they tend to have paradoxical effects on many children with ADHD. Short-term effects include possible improvements in social behaviors such as cooperation, attention, and compliance. Research suggests that about 70% to 80% of children with ADHD are more manageable when on medication. But for many there are negative side effects such as increased heart rate and blood pressure, interference with growth rate, insomnia, weight loss, and nausea (Friend & Bursuck, 2002; Hallahan et al., 2005; Paulson, 1998). In addition, little is known about the long-term effects of drug therapy, so be cautious. Many studies have concluded that the improvements in behavior from the drugs seldom lead to improvements in academic learning or peer relationships, two areas where children with ADHD have great problems. Because students appear to improve dramatically in their behavior, parents and teachers, relieved to see change, may assume the problem has been cured. It hasn’t. The students still need special help in learning (Duggett, 2004; Purdie, Hattie, & Carroll, 2002). One large study in Australia concluded:

Multimodal approaches to intervention have been found to be most effective in terms of lasting change. For most, but not all children and adolescents, treatment with psychostimulants has beneficial effects, provided that it is accompanied by remedial tuition, counselling, and behaviour management by parents/teachers, as required. Thus, advice from several different professions may be necessary. (van Kraayenoord, Rice, Carroll, Fitz, Dillon, & Hild, 2001, p. 7)
What can teachers do? Long assignments may overwhelm students with attention deficits, so give them a few problems or paragraphs at a time with clear consequences for completion. Another promising approach combines instruction in learning and memory strategies with motivational training. The goal is to help students develop the “skill and will” to improve their achievement (Paris, 1988). They are also taught to monitor their own behavior and encouraged to be persistent and to see themselves as “in control” (Reid & Borkowski, 1987).

The notion of being in control is part of a new therapy strategy for dealing with ADHD, one that stresses personal agency. Rather than treating the problem child, David Nylund’s (2000) idea is to enlist the child’s strengths to conquer the child’s problems—put the child in control. New metaphors for the situation are developed. Rather than seeing the problems as inside the child, Nylund helps everyone see ADHD, Trouble, Boredom, and other enemies of learning as outside the child—demons to be conquered or unruly spirits to be enlisted in the service of what the child wants to accomplish. The focus is on solutions. The steps of the SMART approach are:

- Separating the problem of ADHD from the child
- Mapping the influence of ADHD on the child and family
- Attending to the exceptions to the ADHD story
- Reclaiming special abilities of children diagnosed with ADHD
- Telling and celebrating the new story. (Nylund, 2000, p. xix)

As a teacher, you can look for times when the student is engaged—even short times. What is different about these times? Discover the student’s strengths and allow yourself to be amazed by them. Make changes in your teaching that support the changes the student is trying to make. Nylund gives the following example: Chris (age 9) and his teacher, Ms. Baker, became partners in putting Chris in control of his concentration in school. Ms. Baker moved Chris’s seat to the front of the room. The two designed a subtle signal to get Chris back on task, and Chris organized his messy desk. These sound like some of the Section 504 accommodations in Table 4.5. When Chris’s concentration improved, Chris received an award at a party given in his honor. Chris described how he was learning to listen in class: “You just have to have a strong mind and tell ADHD and Boredom not to bother you” (Nylund, 2000, p. 166).

The above methods should be thoroughly tested with the student before drugs are used. Even if students in your class are on medication, it is critical that they also learn the academic and social skills they will need to survive. Again, this will not happen by itself, even if behavior improves with medication (Purdie, et al., 2002).

Reaching Every Student: Higher-Order Thinking

Reading instruction for students with learning disabilities does not have to focus on low-level skills. Joanne Williams (2002) developed the Theme Identification Program to help middle-school students with severe learning disabilities understand and use the abstract idea of themes in literature as briefly described in Table 4.9.

Students with learning disabilities sometimes also have another challenge, attention disorders. In fact, some researchers estimate that there is a 25% to 70% overlap between learning disabilities and attention-deficit hyperactivity disorder (Hardman et al., 2005). And students who are gifted as well as students with other conditions such as behavior disorders, depression, lead poisoning, seizure disorders, or fetal alcohol syndrome may have ADHD symptoms as well (Doggett, 2004). We turn to this disorder next.

Students with Communication Disorders

For the ages of 6 to 21, students with communication disorders are the second largest group served by special education. They make up about 19% of students receiving services. Language disorders can arise from many sources, because so many different aspects of the individual are involved in learning language. A child with a hearing impairment
TABLE 4.9

Higher-Order Comprehension and Severe Learning Disabilities

In the thematic identification program (Osborne, 2002), middle school students with
severe learning disabilities learned to understand and use the abstract idea of themes in
literature. Teachers taught 12 different lessons using 12 stories. Briefly, these are the steps
for the thematic process of each lesson:

Prereading: The teacher defines a theme and discusses the value of themes, drawing on students' personal experiences.

Reading: The teacher reads the story and inserts questions while reading to help students connect what they know to the story. At the end of the reading, the class discusses the main point in the story and the teacher reads a summary highlighting the points.

Discussing Using the Theme Scheme: The teacher and students discuss the important information using six organizing questions. The first four questions focused on the story content:

• Who was the main character?
• What was her/his problem?
• What did she/he do?
• What happened at the end of the story?

The last two questions encouraged students to make judgments in order to identify a theme:

• Was what happened good or bad?
• Why was it good or bad?

Identifying the Theme: Students then state the theme in a standard format:

[The main character] learned that (he) should (not) ________.

We should (not) ________.

The theme of the story is ________.

Application of Theme: The students learn to ask three questions to generalize the theme:

• Can you name someone who should (not) ________?
• When is it important for (that person) to do (or not do) ________?
• In what situation will this help?

Multimodal Activity: Every lesson after the first one included a role-play of the story theme where the students acted out the characters in the story, an art activity to show the theme, or a music activity such as writing a rap song that communicated the theme.

Review: A recap of the Theme Scheme and a preview of the next lesson.


will not learn to speak normally. Injuries can cause neurological problems that interfere with speech or language. Children who are not listened to, or whose perception of the world is distorted by emotional problems, will reflect these problems in their language development. Because speaking involves movements, any impairment of the motor functions involved with speech can cause language disorders. And because language development and thinking are so interwoven, any problems in cognitive functioning can affect ability to use language.

Speech Disorders. Students who cannot produce sounds effectively for speaking are considered to have a speech disorder. About 5% of school-age children have some form of speech impairment. Articulation problems and stuttering are the two most common problems.

Speech disorder: Inability to produce sounds effectively for speaking.
Articulation disorders include substituting one sound for another (thunthine for sunshine), distorting a sound (shoup for soup), adding a sound (ideer for idea), or omitting sounds (go-y for pony) (Smith, 1998). Keep in mind, however, that most children are 6 to 8 years old before they can successfully pronounce all English sounds in normal conversation. The sounds of the consonants i, r, y, s, and z and the consonant blends sh, ch, zh, and th are the last to be mastered. Also, there are dialect differences based on geography that do not represent articulation problems. A child in your class from New England might say “ideer” for “idea,” but have no speech impairment.

Stuttering generally appears between the ages of 3 and 4. Causes of stuttering are unclear, but might include emotional or neurological problems or learned behavior. Whatever the cause, stuttering can lead to embarrassment and anxiety for the sufferer. If stuttering continues more than a year or so, the child should be referred to a speech therapist. Early intervention can make a big difference (Hardman et al., 2005).

Voicing problems, a third type of speech impairment, include speaking with an inappropriate pitch, quality, or loudness, or in a monotone (Hullahan & Kauffman, 2006). A student with any of these problems should be referred to a speech therapist. Recognizing the problem is the first step. Be alert for students whose pronunciation, loudness, voice quality, speech fluency, expressive range, or rate is very different from that of their peers. Pay attention also to students who seldom speak. Are they simply shy, or do they have difficulties with language?

Language Disorders. Language differences are not necessarily language disorders. Students with language disorders are those who are markedly deficient in their ability to understand or express language, compared with other students of their own age and cultural group (Owens, 1999). Students who seldom speak, who use few words or very short sentences, or who rely only on gestures to communicate should be referred to a qualified school professional for observation or testing. Table 4.10 gives ideas for promoting language development for all students.

Communication skills are an important component of a student’s IEP. Adaptations such as assistive communication devices can help students with communication disorders participate in general education activities.
Students with Intellectual Disabilities

Intellectual disability is a more current name for mental retardation. As defined by the American Association on Mental Retardation (AAMR) (2002, p.1), “mental retardation is a disability characterized by significant limitations in both intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.”

Intellectual function is usually measured by IQ tests with a cutoff score of 70 as one indicator of retardation. But an IQ score below the 70 range is not enough to diagnose a child as having intellectual disabilities. There must also be problems with adaptive behavior, day-to-day independent living, and social functioning. This caution is especially important when interpreting the scores of students from different cultures. Defining retardation based on test scores alone can create what some critics call “the 6-hour retarded”—students who are seen as retarded only for the part of the day they attend school.

Only about 1% of the population fit the AAMR’s definition of having retardation in both intellectual functioning and adaptive behavior. For years, retardation was further divided into mild (IQ 50–69), moderate (IQ 35–49), severe (IQ 20–34), and profound (IQ below 20). Many school districts still use this system, and so does the World Health Organization. However, the IQ ranges are not perfect predictors of individuals’ abilities to function, so the AAMR now recommends a classification scheme based on the amount of support that a person requires to function at his or her highest level (Taylor, Richards, & Brady, 2005). Table 4.11 on the next page summarizes this newer classification system.

As a regular teacher, you may not have contact with children needing extensive or pervasive support unless your school is participating in a full inclusion program for exceptional students (described earlier in this chapter), but you probably will work with
TABLE 4.11

<table>
<thead>
<tr>
<th>Classification Scheme for Mental Retardation</th>
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<tr>
<td>This new scheme for classification is based on the level of support a student would need to function as completely as possible.</td>
</tr>
<tr>
<td>Intermittent</td>
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<tr>
<td>Limited</td>
</tr>
<tr>
<td>Extensive</td>
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<tr>
<td>Pervasive</td>
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</table>

Source: From Mental Retardation: Definition, Classification, and Systems of Support (11th ed., p. 152), by AAMR Ad Hoc Committee on Terminology and Classification, 2007. Copyright © 2002 by the American Association on Mental Retardation. Reprinted with permission from the AAMR.

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children with mild retardation. In the early grades, these students may simply learn more slowly than their peers. They need more time and more practice to learn and have difficulty transferring learning from one setting to another or putting small skills together to accomplish a more complex task. The Guidelines list suggestions for teaching students with below-average general intelligence.

Learning goals for many students with intellectual disabilities between the ages of 9 and 13 include basic reading, writing, arithmetic, learning about the local environment, social behavior, and personal interests. In junior and senior high school, the emphasis is on vocational and domestic skills, literacy for living (using the telephone book, reading signs, labels, and newspaper ads; completing a job application), job-related behaviors such as courtesy and punctuality, health self-care, and citizenship skills. Today, there is a growing emphasis on transition programming—preparing the student to live and work in the community. As you saw earlier in the chapter, the law requires that schools design an IEP, or individualized educational program, for every child with disabilities. An ITP, or individualized transition plan, may be part of the IEP for students with retardation (Friend, 2005).

Students with Emotional or Behavioral Disorders

Students with emotional and behavioral disorders can be among the most difficult to teach in a regular class, and are a source of concern for many prospective teachers (Arvanitis, Bayless, & Burden, 2000). Professionals in education state that behavioral disorders are behaviors that deviate so much from the norm that they interfere with the child’s own growth and development and/or the lives of others. Clearly, deviation implies a difference from some standard, and standards of behavior differ from one situation, age group, culture, ethnic group, and historical period to another. What passes for team spirit in the football bleachers might be seen as disturbed behavior in a bank or restaurant. In addition, the deviation must be more than a temporary response to stress or events; it must be consistent across time and in different situations and the student must not have responded to direct interventions in general education (Forness & Knitzer, 1992).

There are other definitions. The language in IDEA describes emotional disturbances (ED) that involve inappropriate behaviors, unhappiness or depression, fears and anxieties, and trouble with relationships.
Guidelines: Teaching Students with Below-Average Intelligence

1. Determine readiness: However little a child may know, he or she is ready to learn the next step.
2. State and present objectives simply.
4. Present material in small, logical steps. Practice extensively before going on to the next step.
5. Work on practical skills and concepts based on the demands of adult life.
6. Do not skip steps. Students with average intelligence can form conceptual bridges from one step to the next, but children with below-average intelligence need every step and bridge made explicit. Make connections for the student. Do not expect him or her to "see" the connections.
7. Be prepared to present the same idea in many different ways.
8. Go back to a simpler level if you see the student is not following.
9. Be especially careful to motivate the student and maintain attention.
10. Find materials that do not insult the student. A junior high boy may need the low vocabulary of "See Spot run," but will be insulted by the age of the characters and the content of the story.
11. Focus on a few target behaviors or skills so you and the student have a chance to experience success. Everyone needs positive reinforcement.
12. Be aware that students with below-average intelligence must learn, repeat, and practice more than children of average intelligence. They must be taught how to study, and they must frequently review and practice their newly acquired skills in different settings.
13. Pay close attention to social relations. Simply including students with below-average intelligence in a regular class will not guarantee that they will be accepted or that they will make and keep friends.

For more information, see:
http://www.aamr.org/Policies/mental_retardation.shtml
http://www.ed.wright.edu/~prenick/karch.htm

eties, and trouble with relationships. The American Psychological Association and the medical community refer to mental disorders (Friend, 2006). Table 4.12 on the next page describes a few of the specific disorders covered by the Diagnostic and Statistical Manual of Mental Disorders (4th edition, revised), also called the DSM-IV-TR.

However they are defined, in the school year 2000–2001, there were almost 475,000 students with emotional disturbances identified making this the 4th largest group receiving services. This number has increased 18% since 1991–1992. As with learning disabilities and ADHD, there are more boys than girls diagnosed with these disorders. For behavioral disorders, the numbers are about 6 to 9 times as many boys as girls. One troubling fact is that African American students are overrepresented in this category. They make up about 15% of the population, but about 27% of the students identified with emotional and behavioral disorders.

The range of possible emotional and behavioral disorders is wide. And students with other disabilities—learning disabilities, intellectual disabilities, or ADHD, for example—may have emotional or behavioral problems also as they struggle in school. Methods from applied behavioral analysis (Chapter 6) and direct teaching of social skills (Chapter 3) are two useful approaches. Another possibility that has proved helpful for these students is to provide structure, organizational tools, and choices. Here are some ideas from Terri Swanson (2005):

- **Structure the environment** by minimizing visual and auditory stimulation, establishing clear visual boundaries between areas where different behaviors are expected, or organizing supplies in easy-to-use holders.
- **Structure schedules** by posting monthly and daily schedules, having clear starting and ending signals and clear procedures for turning in work.
- **Structure activities** by color-coding subject folders (blue for math, etc.), posting verbal instructions with visual prompts, or putting all materials needed for an activity in a "Science box."

Connect and Extend to Other Chapters

In Chapter 12, you will find ideas for dealing with mild-to-moderate behavior problems.
### TABLE 4.12

Examples of Emotional and Behavioral Disorders from the *Diagnostic and Statistical Manual of Mental Disorders*

The definition of emotional and behavior disorders in IDEA is general; it does not list particular conditions. However, in the medical community many specific disorders have been identified, and these are included in the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition, text revision) (*DSM-IV-TR*). Instead of being called emotional and behavior disorders, they are referred to as mental disorders. The following list, although not complete, includes examples of mental disorders listed in that publication that educators would consider emotional and behavior disorders:

- **Anxiety disorders.** Anxiety disorders occur when students experience an overwhelming sense of fear or dread. One example is obsessive-compulsive disorder (OCD) in which students cannot stop themselves from worrying excessively about a specific concern, for example, germs. Other examples include phobias (fear of specific items, such as spiders, or fear of certain activities, such as going to school) and posttraumatic stress disorder (PTSD) in which students re-live in nightmares or flashbacks a traumatic event that they witnessed.

- **Disruptive behavior disorders.** This category includes three types of disorders:
  - **Attention deficit/hyperactivity disorder** is characterized by inattention, a high level of activity and impulsivity, or a combination of these. Note, though, that it often is not considered a disability.
  - **Oppositional defiant disorder** (ODD) is diagnosed when students are defiant with adults and vindictive or blaming with peers to an excessive degree over a long period of time.
  - **Conduct disorders** are diagnosed when students fight, bully, display cruelty to animals or people, or otherwise repeatedly break serious rules.

- **Eating disorders.** The most common eating disorder is anorexia nervosa, in which students believe they are overweight and refuse to eat, even when they are near starvation.

- **Mood disorders.** Also called affective disorders, this group includes depression . . . and bipolar disorder, also called manic depression, in which students' moods swing from extreme highs (manic) to extreme lows (depression).

- **Tic disorders.** Tics are involuntary, rapid, stereotyped movements of specific muscle groups. Students with tics may blink their eyes or repeatedly sniff. The most well known tic disorder is Tourette syndrome, a disorder that ranges from mild to severe and includes both facial or other physical tics as well as vocal tics, often “barking” or profanity.

*Source: From “Diagnostic and Statistical Manual of Mental Health” in Special Education: Contemporary Perspectives for School Professionals by M. Friend. Published by Allyn and Bacon, Boston, MA. Copyright © 2006 by Pearson Education. Reprinted by permission of the publisher.*

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**Structure rules and routines,** for example, giving students a script to use in asking other students to play a game with them, writing rules out in a positive way, or preparing students for changes in routines such as spring break by reviewing pictures of what will be happening over the break.

**Offer choices** by providing a short list of alternatives to complete assignments or projects.

Because students with emotional and behavioral disorders frequently break rules and push the limits, teachers often find themselves disciplining the students. Be aware that there have been court rulings on disciplining students with serious emotional problems (Yell, 1990). The Guidelines may help when you are faced with these situations.

Let's consider an area where teachers may be able to detect problems and make a difference—suicide.

**Suicide.** Of course, not every student with emotional or behavioral problems will consider suicide, and many people without such problems will. But depression often is associated with suicide. Up to 10% of adolescents have attempted suicide at some point, but even more have considered it. Native Americans and students living in rural communities are more likely to commit suicide. There are four general risk factors, and they seem to apply to both male and female African American, Latino, and White adolescents: de-
Guidelines: Disciplining Students with Emotional Problems

Be careful not to violate due process rights of students—students and parents must know the behaviors expected and the consequences for misbehavior.

**Examples:**
1. Communicate expectations clearly and in writing.
2. Ask parents and students to sign a copy of the classroom rules.
3. Post rules and consequences in class and on a class Web page.

Be very careful with severe punishments that remove students from class for a long time. These constitute a change in the child’s educational program (IEP) and require due process.

**Examples:**
1. Suspensions of more than 10 days require due process.
2. Prolonged periods of time-out (in-school suspension) may require due process.

Punishments for students with severe emotional problems must serve a clear educational purpose.

**Examples:**
1. Give a rationale for punishment or correction that ties an action to student’s learning or the learning of others in the class.
2. Use written behavior contracts that include a rationale.

Make sure the rule and the punishment are reasonable.

**Examples:**
1. Consider the student’s age and physical condition.

2. Does the punishment match the offense and the way others in the class are treated?
3. Do other teachers handle similar situations in the same way?
4. Try less intrusive punishments first. Be patient. Move to more severe actions only when less severe procedures fail.

Keep good records and work collaboratively so all involved are informed.

**Examples:**
1. Document the punishment of all students in a journal or log. List what precipitated the punishment, what procedures were used, how long the punishment lasted, the results, modifications to the punishment, and new results.
2. Note meetings with families, special education teachers, and the principal.
3. Make any changes involving management plans with families and other teachers.

Always use positive consequences in conjunction with negative ones.

**Examples:**
1. If students lose points for breaking rules, give them ways to regain points through positive behavior.
2. Recognize genuine accomplishment and small steps—DON’T say, “Well it’s about time you...”

For more information on disciplining students with disabilities, see:
- http://wrightslaw.com/
- http://www.schwablearning.org/

pression and substance abuse, history of suicide in the family, being under stress, and family rejection or conflict. Having more than one of these risk factors is especially dangerous (Steinberg, 2005). In addition, there is concern today that some drugs prescribed for depression may increase the risk of suicide in adolescents.

Suicide often comes as a response to life problems—problems that parents and teachers sometimes dismiss. There are many warning signs that trouble is brewing. Watch for changes in eating or sleeping habits, weight, grades, disposition, activity level, or interest in friends or activities that were once fun. Students at risk sometimes suddenly give away prized possessions such as stereo, CDs, clothing, or pets. They may seem depressed or hyperactive and may say things like “Nothing matters anymore,” “You won’t have to worry about me anymore,” or “I wonder what dying is like.” They may start missing school or quit doing work. It is especially dangerous if the student not only talks about suicide, but also has a plan for carrying it out.

If you suspect that there is a problem, talk to the student directly. One feeling shared by many people who attempt suicide is that no one really takes them seriously. “A question about suicide does not provoke suicide. Indeed, teens (and adults) often experience relief when someone finally cares enough to ask” (Range, 1993, p. 145). Be realistic, not poetic,
TABLE 4.13

<table>
<thead>
<tr>
<th>Myths and Facts about Suicide</th>
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</thead>
<tbody>
<tr>
<td><strong>Myth:</strong> People who talk about suicide don’t kill themselves.</td>
</tr>
<tr>
<td><strong>Fact:</strong> Eight out of ten people who commit suicide tell someone that they’re thinking about hurting themselves before they actually do it.</td>
</tr>
<tr>
<td><strong>Myth:</strong> Only certain types of people commit suicide.</td>
</tr>
<tr>
<td><strong>Fact:</strong> All types of people commit suicide—male and female, young and old, rich and poor, country people and city people. It happens in every racial, ethnic, and religious group.</td>
</tr>
<tr>
<td><strong>Myth:</strong> When a person talks about suicide, you should change the subject to get his or her mind off it.</td>
</tr>
<tr>
<td><strong>Fact:</strong> You should take them seriously. Listen carefully to what they are saying. Give them a chance to express their feelings. Let them know you are concerned. And help them get help.</td>
</tr>
<tr>
<td><strong>Myth:</strong> Most people who kill themselves really want to die.</td>
</tr>
<tr>
<td><strong>Fact:</strong> Most people who kill themselves are confused about whether they want to die. Suicide is often intended as a cry for help.</td>
</tr>
</tbody>
</table>


about suicide. Ask about specifics, and take the student seriously. Also, be aware that teenage suicides often occur in clusters. After one student acts or when stories about a suicide are reported in the media, other teens are more likely to copy the suicide (Lewinskih, Rohde, & Sceley, 1994; Rice & Dolgin, 2002). Table 4.13 lists common myths and facts about suicide.

**Drug Abuse.** Although drug abuse is not always associated with emotional or behavioral problems and people without these challenges may abuse drugs, many adolescents with emotional problems also abuse drugs. Modern society makes growing up a very confusing process. Notice the messages from films and billboards. “Beautiful,” popular people drink alcohol and smoke cigarettes with little concern for their health. We have over-the-counter drugs for almost every common ailment. Coffee wakes us up, and a pill helps us sleep. And then we tell students to “say no!” to drugs.

For many reasons, not just because of these contradictory messages, drug use has become a problem for students. Accurate statistics are hard to find, but estimates from the Monitoring the Future survey conducted by the University of Michigan indicate that 15% of 8th graders, 31% of 10th graders, and 39% of 12th graders had used an illicit drug in the past year, with marijuana being the most popular drug. Drug use among secondary school students has been gradually declining or holding steady since about 2001, with the exception of inhalants. Inhalants (glues, paint thinners, nail polish remover, aerosol sprays, etc.) are inexpensive and available. Also, students don’t realize that they are risking injury or death when they use inhalants. The proportion of 8th and 10th graders who believe that inhalants are dangerous is actually declining (Johnston, O’Malley, Bachman, & Schulenberg, 2004).

We should distinguish between experimentation and abuse. Many students try something at a party, but do not become regular users. The best way to help students who have trouble saying no appears to be through peer programs that teach them how to say no assertively. Also, the older students are when they experiment with drugs, the more likely they are to make responsible choices, so helping younger students say no is a clear benefit.

**Prevention.** Providing information or “scare” tactics such as the DARE drug prevention program seem to have little positive effect and may even encourage curiosity and experimentation (Dusenbury & Falco, 1995; Tobler & Stratton, 1997). The most effective prevention programs include developmentally appropriate language and concepts; teach students to resist social pressure; provide accurate information about rates of behavior (not everyone is doing it); use interactive teaching methods such as role-playing or small groups; provide training in skills that help in many situations such as the 6-step problem-
solving strategy described in Chapter 12; give thorough coverage of the topic with follow-up; and practice cultural sensitivity.

Debra Stipek and her colleagues (1999) describe many ways that teachers embed life lessons into school subjects and informal discussions. For example, class rules emphasize respect (“there are no stupid questions”); students learn to give “put ups” not “put downs”; the lives of historical figures provide opportunities to discuss choices and how to deal with stresses; and student conflicts become life lessons in relationships. In addition, students are given a “Toolbox of Coping Skills” that contains concrete objects to be used to address problems. The Toolbox includes Post-it® notes to record student concerns and troubling situations, so that the incidents can be dealt with at an appropriate time. Exit and U-turn signs remind students that the best strategy may be to “exit” the situation. “Exiting to a safe place, without explanation, is taught as one appropriate face-saving, and possibly life-saving, response” (Stipek et al., 1999, p. 443). Early indicators are that students do learn to use these skills.

Less Prevalent Problems/More Severe Disabilities

In this section, we meet students with more severe disabilities. In your first years of teaching, you may encounter only a few of these students, but you still can make a difference in their lives.

Students with Health Impairments

Some students must use special devices such as braces, special shoes, crutches, or wheelchairs to participate in a normal school program. If the school has the necessary architectural features, such as ramps, elevators, and accessible rest rooms, and if teachers allow for the physical limitations of students, little needs to be done to alter the usual educational program. Two other health impairments you may encounter are cerebral palsy and seizure disorders.

Cerebral Palsy and Multiple Disabilities. Damage to the brain before or during birth or during infancy can cause a child to have difficulty moving and coordinating his or her body. The problem may be very mild, so the child simply appears a bit clumsy, or so
Seizure Disorders (Epilepsy). A seizure is a cluster of behaviors that occurs in response to abnormal neurochemical activities in the brain (Hardman, Drew, & Kogan, 2005). People with epilepsy have recurrent seizures, but not all seizures are the result of epilepsy; temporary conditions such as high fevers or infections can also trigger seizures. Seizures take many forms and differ with regard to the length, frequency, and movements involved. A partial or absence seizure involves only a small part of the brain, whereas a generalized or tonic-clonic seizure includes much more of the brain.

Most generalized seizures (once called grand mal) are accompanied by uncontrolled jerking movements that ordinarily last between five and ten minutes, possible loss of bowel or bladder control, and irregular breathing, followed by a deep sleep or coma. On regaining consciousness, the student may be very weary, confused, and in need of extra sleep. Most seizures can be controlled by medication. If a student has a seizure accompanied by convulsions in class, the teacher must take action so the student will not be injured. The major danger to a student having such a seizure is getting hurt by striking a hard surface during the violent jerking.

If a student has a seizure, stay calm and reassure the rest of the class. Do not try to restrain the child’s movements; you can’t stop the seizure once it starts. Lower the child gently to the floor, away from furniture or walls. Move hard objects away. Loosen scarves, ties, or anything that might make breathing difficult. Turn the child’s head gently to the side, put a soft coat or blanket under the student’s head. Never put anything in the student’s mouth—it is NOT true that people having seizures can swallow their tongues. Don’t attempt artificial respiration unless the student does not start breathing again after the seizure stops. Find out from the student’s parents how they deal with seizures. If one seizure follows another and the student does not regain consciousness in between, if the student is pregnant or has a medical ID that does not say “epilepsy, seizure disorder,” if there are signs of injury, or if the seizure goes on for more than 5 minutes, get medical help right away (Friend, 2005).

Not all seizures are dramatic. Sometimes the student just loses contact briefly. The student may stare, fail to respond to questions, drop objects, and miss what has been happening for 1 to 30 seconds. These were once called petit mal, but they are now referred to as absence seizures and can easily go undetected. If a child in your class appears to daydream frequently, does not seem to know what is going on at times, or cannot remember what has just happened when you ask, you should consult the school psychologist or nurse. The major problem for students with absence seizures is that they miss the continuity of the class interaction—these seizures can occur as often as 100 times a day. If their seizures are frequent, students will find the lessons confusing. Question these students to be sure they are understanding and following the lesson. Be prepared to repeat yourself periodically.

Students Who Are Deaf

You will hear the term, “hearing impaired,” to describe these students, but the deaf community and researchers object to this term, so I will use their preferred terms, deaf and hard of hearing. The number of deaf students has been declining over the past three decades, but when the problem does occur, the consequences for learning are serious (Hunt & Marshall, 2002). Signs of hearing problems are turning one ear toward the speaker, favoring one ear in conversation, or misunderstanding conversation when the speaker’s face cannot be seen. Other indications include not following directions, seeming distracted or confused at times, frequently asking people to repeat what they have said, mispronouncing...
new words or names, and being reluctant to participate in class discussions. Take note particularly of students who have frequent earaches, sinus infections, or allergies.

In the past, educators have debated whether oral or manual approaches are better for children who are deaf or hard of hearing. Oral approaches involve speech reading (also called lip reading) and training students to use whatever limited hearing they may have. Manual approaches include sign language and finger spelling. Research indicates that children who learn some manual method of communicating perform better in academic subjects and are more socially mature than students who are exposed only to oral methods. Today, the trend is to combine both approaches (Hallahan & Kauffman, 2006).

Another perspective suggests that people who are deaf are part of a different culture with a different language, values, social institutions, and literature. Hunt and Marshall (2002) quote one deaf professional: “How would women like to be referred to as male-impaired, or whites like to be called black-impaired? I’m not impaired; I’m deaf!” (p. 348). From this perspective, a goal is to help deaf children become bilingual and bicultural, to enable them to function effectively in both cultures. Technological innovations such as teletypewriters in homes and public phones and the many avenues of communication through e-mail and the Internet have expanded communication possibilities for all people, including those with hearing problems.

**Students with Vision Impairments**

In the United States, only about 1 child in 1,000 has visual impairments so serious that special educational services are needed. Most members of this group needing special services are classified as having **low vision**. This means they can read with the aid of a magnifying glass or large-print books. A small group of students, about 1 in every 2,500, is **educationally blind**. These students must use hearing and touch as their predominant learning channels (Kirk, Gallagher, & Anastasiow, 1993).

Students who have difficulty seeing often hold books either very close to or very far from their eyes. They may squint, rub their eyes frequently, or complain that their eyes burn or itch. The eyes may actually be swollen, red, or encrusted. Students with vision problems may misread material on the chalkboard, describe their vision as being blurred, be very sensitive to light, or hold their heads at an odd angle. They may become irritable when they have to do deskwork or lose interest if they have to follow an activity taking place across the room (Hunt & Marshall, 2002). Any of these signs should be reported to a qualified school professional.

Special materials and equipment that help these students to function in regular classrooms include large-print books; software that converts printed material to speech or to braille; personal organizers (like a Palm) that have talking appointment books or address books; variable-speed tape recorders (allowing teachers to make time-compressed tape recordings, which speed up the rate of speech without changing the voice pitch); special calculators; an abacus; three-dimensional maps, charts, and models; and special measuring devices. For students with visual problems, the quality of the print is often more important than the size, so watch out for hard-to-read handouts and blurry copies.

The arrangement of the room is also an issue. Students with visual problems need to know where things are, so consistency matters—a place for everything and everything in its place. Leave plenty of space for moving around the room and make sure to monitor possible obstacles and safety hazards such as trash cans in aisles and open cabinet doors. If you rearrange the room, give students with visual problems a chance to learn the new layout. Make sure the students have a buddy for fire drills or other emergencies (Friend & Burns, 2002).

**Autism Spectrum Disorders**

You may be familiar with the term “autism.” In 1990, autism was added to the IDEA list of disabilities qualifying for special services. It is defined as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects the child’s educational performance” (Friend & Burns, 2002).
(34 Federal Code of Regulations § 300.7). I have used the term preferred by professionals in the field, "autism spectrum disorders," to emphasize that autism includes a range of disorders from mild to major. From an early age, children with autism spectrum disorders may have difficulties in social relations. They do not form connections with others, avoid eye contact, or don't share feelings such as enjoyment or interest with others. Communication is impaired. About half of these students are nonverbal; they have very few or no language skills. Others make up their own language. They may obsessively insist on regularity and sameness in their environments—change is very disturbing. They may repeat behaviors and have restricted interests, watching the same DVD over and over, for example. They may be very sensitive to light, sound, touch, or other sensory information—sounds may be painful, for example. They may be able to memorize words or steps in problem solving, but not use them appropriately or be very confused when the situation changes or questions are asked in a different way (Friend, 2006).

Asperger syndrome is one of the disabilities included in the autistic spectrum. These children have many of the characteristics described above, but their greatest trouble is with social relations. Language is less affected. Their speech may be fluent, but unusual, mixing up pronouns of "I" and "you," for example (Friend, 2006). Many students with autism also have moderate-to-severe intellectual disabilities, but those with Asperger syndrome usually have average-to-above-average intelligence.

Theory of Mind. One current explanation for autism and Asperger syndrome is that children with these disorders lack a theory of mind—an understanding that they and other people have minds, thoughts, and emotions. They have difficulty explaining their own behaviors, appreciating that other people might have different feelings, and predicting how behaviors might affect emotions. So, for example, a student may not understand why classmates are bored by his constant repetition of stories or obscure facts about topics he finds fascinating. Or the student may stand too close or too far away when interacting, not realizing that she is making other people uncomfortable (Friend, 2006).

Interventions. Early and intense interventions that focus on communication and social relations are particularly important for children with autism spectrum disorders. As they move into elementary school, some of these students will be in inclusive settings, others in specialized classes, and many in some combination of these two. Collaboration among teachers and the faculty is particularly important. Supports such as smaller classes, structured environments, providing a safe "home base" for times of stress, consistency in instruction, assistive technologies, and the use of visual supports may be part of a collaborative plan (Friend, 2006). Through adolescence and the transition to adulthood, life, work, and social skills are important educational goals.

We end the chapter with another group that has special needs, but is not covered by IDEA or Section 504—highly intelligent or talented students.

Students Who Are Gifted and Talented

Consider this situation, a true story.

Latoya was already an advanced reader when she entered 1st grade in a large urban school district. Her teacher noticed the challenging chapter books Latoya brought to school and read with little effort. After administering a reading assessment, the school's reading consultant confirmed that Latoya was reading at the 5th grade level. Latoya's parents reported with pride that she had started to read independently when she was 3 years old and "had read every book she could get her hands on." (Reis et al., 2002)

In her struggling urban school, Latoya received no particular accommodations, and by 5th grade, she was still reading at just above the 5th grade level. Her 5th grade teacher had no idea that Latoya had ever been an advanced reader.

Latoya is not alone. There is a group with special needs that is often overlooked by the schools: gifted and talented students. In the past, providing an enriched education
for extremely bright or talented students was seen as undemocratic and elitist. Now, there is a growing recognition that gifted students are being poorly served by most public schools. A national survey found that more than one-half of all gifted students do not achieve in school at a level equal to their ability (Tomlinson-Kelsey, 1990). In 1988, the federal government passed the Gifted and Talented Students Education Act that recognized that these students need special services, but the law did not require states to provide services that would enable students like Latoya to get an appropriate education.

Who Are These Students?

There are many definitions of gifted because individuals can have many different gifts. Remember that Gardner (2003) identified eight separate “intelligences” and Sternberg (1997) suggests a triarchic model. Renzulli and Reis (2003) have a different three-part conception of giftedness: above-average general ability, a high level of creativity, and a high level of task commitment or motivation to achieve. One of the most inclusive definitions comes from the U.S. Department of Education (1993):

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment. These children and youth exhibit high capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools. Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (p. 26)

Truly gifted children are not the students who simply learn quickly with little effort. The work of gifted students is original, extremely advanced for their age, and potentially of lasting importance. These children may read fluently with little instruction by age 3 or 4. They may play a musical instrument like a skilled adult, turn a visit to the grocery store into a mathematical puzzle, and become fascinated with algebra when their friends are having trouble carrying in addition (Winner, 2000). Recent conceptions widen the view of giftedness to include attention to the children’s culture, language, and exceptionalities (Association for the Gifted, 2001). These newer conceptions are more likely to identify children like Charelle in the Stories of Learning/Tributes to Teaching feature.

Connect and Extend to the Research

A follow-up of Terman subjects 60 years later found that Terman’s subjects who were popular and outgoing as children were less likely to maintain serious intellectual interests as adults. The authors of the study speculate that an active social life may divert interest away from intellectual pursuits (Tomlinson-Kelsey & Little, 1990). In fact, gifted children tend to be introverted—they don’t mind being alone and may even need solitude to develop their talents (Winner, 2000). Every path has its benefits and its liabilities for the individual.

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STORIES OF LEARNING
TRIBUTES TO TEACHING

CHARELLE is an African American student in the third grade, on free lunch, homeless for much of the year, and much loved and supported by both parents. Her mother is a housekeeper in a local hospital. Her father “flips burgers” (her words) at a fast-food restaurant. Now in housing in a different school zone, Charelle still attends the school in which she began, because her mother makes the long bus ride with Charelle, continuing on to her own job via public transportation. Charelle is often as much as an hour late for class because of the extended bus ride, but when she arrives in her classroom, she becomes immediately absorbed in her schoolwork. Charelle’s teacher feels the long ride seems worthwhile to Charelle’s parents because the school has been nurturing to the family; and that Project START “may have been the icing on the cake (that kept them coming).”

Charelle seems to be hungry, not so much for food as for knowledge. She often asks for extra schoolwork to do at home. Her current teacher calls her “a joy. I feel lucky to have her in my class. She coaches, like, ‘Well, maybe we should do this.’ She’s blown the doors off math in here. I have her well into fourth-grade math.” Charelle’s second-grade teacher echoes, “She’s very talented in writing and reading. She is very creative, good in art, good in all subjects.” The teacher points out a piece of Charelle’s artwork, which is permanently displayed in the school corridor.

There are few children intrinsically motivated like Charelle. She’s a real big ham. She would act out anything. She’s just kind of bright and bubbly and effervescent and gregarious. She writes. She loves to tell stories. She’s a good writer in a group. Not as a forceful leader, but she coaches, like, ‘Well, maybe we should do this.’” She’s blown the doors off math in here. I have her well into fourth-grade math.” Charelle’s second-grade teacher echoes, “She’s very talented in writing and reading. She is very creative, good in art, good in all subjects.” The teacher points out a piece of Charelle’s artwork, which is permanently displayed in the school corridor.

For resources on gifted students, see the Johns Hopkins University Center for Talented Youth: http://www.jhu.edu/~gipted/

What do we know about these remarkable individuals? A classic study of the characteristics of the academically and intellectually gifted was started decades ago by Lewis Terman and colleagues (1925, 1947, 1959; Holahan & Sears, 1995). This huge project is following the lives of 1,528 gifted males and females and will continue until the year 2010. The subjects all have IQ scores in the top 1% of the population (140 or above on the Stanford-Binet individual test of intelligence). They were identified on the basis of these test scores and teacher recommendations.

Terman and colleagues found that these gifted children were larger, stronger, and healthier than the norm. They often walked sooner and were more athletic. They were more emotionally stable than their peers and became better-adjusted adults than the average individual. They had lower rates of delinquency, emotional difficulty, divorce, drug problems, and so on. Of course, the teachers in Terman’s study who made the nominations may have selected students who were better adjusted initially. And remember, Terman’s study just tells about academically gifted students. There are many other kinds of gifts.

**What is the Origin of These Gifts?** For years, researchers have debated the nature/nurture question about people with extraordinary abilities and talents. As usual, there is evidence that it takes both. Studies of prodigies and geniuses in many fields document that deep and prolonged practice is necessary to achieve at the highest levels. For example, it took Newton 20 years to move from his first ideas to his ultimate contribution (Howe, Davidson, & Sloboda, 1998; Winner, 2000).

I remember listening to the early reports of Bloom’s study of talent (1982). His research team had interviewed, among others, the top tennis players in the world, their coaches, parents, siblings, and friends. One coach said that he would make a suggestion, and a few days later the young athlete would have mastered the move. Then the parents told how the child had practiced that move for hours on end after getting the coach’s tip. So, focused, intense practice plays a role. Also, the families of prodigies tend to be child-centered and to devote hours to supporting the development of their child’s gifts. Bloom’s research team described tremendous sacrifices made by families: rising before dawn to drive their child to a coach in another city, working two jobs, or even moving the whole family to another part of the country to find the best teachers or coaches. The children responded to the family’s sacrifices by working harder and the families responded to the child’s hard work by sacrificing more—an upward spiral of investment and achievement.

But hard work will never make me a world-class tennis player or a Newton. There is a role for nature as well. The children studied by Bloom showed early and clear talent in the areas they later developed. As children, great sculptors were constantly drawing and mathematicians were fascinated with dials, gears, and gauges. Parents’ investments in their children came after the children showed early high-level achievement (Winner, 2000; 2003). Recent research suggests that gifted children, at least those with extraordinary abilities in mathematics, music, and visual arts, may have unusual brain organization—which can have both advantages and disadvantages. Giftedness in mathematics, music, and visual arts appears to be associated with superior visual-spatial abilities and enhanced development of the right side of the brain. Children with these gifts are also more likely not to have right-hand dominance and to have language-related problems. These brain differences are evidence that “gifted children, child prodigies, and savants are not made from scratch but are born with unusual brains that enable rapid learning in a particular domain” (Winner, 2000, p. 160).

**What Problems Do the Gifted Face?** In spite of Bloom’s and Terman’s findings, it would be incorrect to say that every gifted student is superior in adjustment and emotional health. In fact, gifted adolescents, especially girls, are more likely to be depressed and to report social and emotional problems (Berk, 2005). Many difficulties confront a gifted child, including boredom and frustration in school as well as isolation (sometimes even ridicule) from peers. Schoolmates may be consumed with baseball or worried about failing math, while the gifted child is fascinated with Mozart, focused on a social
Identifying and Teaching Gifted Students

**WHAT WOULD YOU SAY?**

Another job interview question: Describe a learning activity that you have planned for a class and ways that you have accommodated individual learning needs.

Identifying gifted children is not always easy, and teaching them well may be even more challenging. Many parents provide early educational experiences for their children. Even very advanced reading ability in the early grades does not guarantee that students will still be outstanding readers years later (Mills & Jackson, 1999). In junior high and high school, some very able students deliberately earn lower grades, making their abilities even harder to recognize. Girls are especially likely to hide their abilities (Berk, 2005).

**Recognizing Gifts and Talents.** Teachers are successful only about 10% to 50% of the time in picking out the gifted children in their classes (Fox, 1981). Here are a few questions to guide identification, suggested by Marilyn Friend (2005). Who can easily manipulate abstract symbols such as mathematics? Who can concentrate for long periods of time on personal interests? Who remembers easily? Who developed language and reading early, like Latoya described at the beginning of this section? Who is curious and has many interests? Whose work is original and creative? These students may also prefer to work alone, have a keen sense of justice and fairness, be energetic and intense, form strong commitments to friends—often older students, and struggle with perfectionism.

Group achievement and intelligence tests tend to underestimate the IQs of very bright children. Group tests may be appropriate for screening, but they are not appropriate for making placement decisions. Many psychologists recommend a case study approach to identifying gifted students. This means gathering many kinds of information about the student in different contexts: test scores, grades, examples of work, projects and portfolios, letters or ratings from community or church members, self-ratings, nominations from teachers or peers, and so on (Renzulli & Reis, 2003; Sisk, 1988). Especially for recognizing artistic talent, experts in the field can be called in to judge the merits of a child's creations. Science projects, exhibits, performances, auditions and interviews are all possibilities. Creativity tests may identify some children not picked up by other measures, particularly minority students who may be at a disadvantage on the other types of tests (Maker, 1987). Remember, students with remarkable abilities in one area may have much less impressive abilities in others. In fact, there may be up to 180,000 students in American schools who are gifted and learning disabled (Davis & Rimm, 1985).

**Teaching Gifted Students.** Some educators believe that gifted students should be accelerated—moved quickly through the grades or through particular subjects. Other educators prefer enrichment—giving the students additional, more sophisticated, and more thought-provoking work, but keeping them with their age-mates in school. Actually, both may be appropriate (Torrance, 1986). One way of doing this is through curriculum compacting—assessing students' knowledge of the material in the instructional unit, then

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**Students Who Are Gifted and Talented**

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Connect and Extend to the Research

The September 2001 issue of *Psychology in the Schools* has several articles on identifying and teaching underrepresented gifted students.

Connect and Extend to the Research

- There are three groups of students who are underrepresented in gifted education programs: women, students with learning disabilities, and students living in poverty (Stemmer, Stephens, & Holliday, 2001).

- Girls and Giftedness. As young girls develop their identities in adolescence, they often resist being labeled as gifted—being accepted and popular, fitting in may become more important than achievement (Gross & Rubin, 1999; Stemmer et al., 2001). How can teachers reach gifted girls? Here are some ideas:
  - Notice when girls’ test scores seem too high to be real or high enough.
  - Encourage exceptional achievement, high grades, and demanding work from all students.
  - Provide models of achievement through speakers, internships, or reading.
  - Look for gifted girls in arenas other than academic achievement.

- Gifted Students with Learning Disabilities Twice-Exceptional?

  Here are some ideas for supporting twice-exceptional students (McClatchy, Kelle, Bray, & Siegel, 2001):
  - Identify these students by looking longitudinally at achievement.
  - Recognize skill deficits but also identify and develop talents and strengths.
  - Provide emotional support, it is important for all students, but especially for this group.
  - Help students learn to cope with perfectionism, learning problems, and assert them in order to use their own strengths and difficulties.
### TABLE 4.14

Examples of How to Modify Content for Students with Gifts and Talents

<table>
<thead>
<tr>
<th>Modification</th>
<th>Math</th>
<th>Science</th>
<th>Language Arts</th>
<th>Social Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceleration</td>
<td>Algebra in fifth grade</td>
<td>Early chemistry and physics</td>
<td>Learning grammatical structure early</td>
<td>Early introduction to world history</td>
</tr>
<tr>
<td>Enrichment</td>
<td>Changing bases in number systems</td>
<td>Experimentation and data collecting</td>
<td>Short story and poetry writing</td>
<td>Reading biographies for historical insight</td>
</tr>
<tr>
<td>Sophistication</td>
<td>Mastering the laws of arithmetic</td>
<td>Learning the laws of physics</td>
<td>Mastering the structural properties of plays, sonnets, and so on</td>
<td>Learning and applying the principles of economics</td>
</tr>
<tr>
<td>Novelty</td>
<td>Probability and statistics</td>
<td>Science and its impact on society</td>
<td>Rewriting Shakespeare’s tragedies with happy endings</td>
<td>Creating future societies and telling how they are governed</td>
</tr>
</tbody>
</table>

From *Teaching the Gifted Child, 4th* ed. by J. J. Gallagher & S. A. Gallagher. Published by Allyn and Bacon, Boston, MA. Copyright © 1984 by Pearson Education. Adapted by permission of the publisher.

Gifted Students who Live in Poverty:

Health problems, lack of resources, homelessness, fears about safety and survival, frequent moves, and responsibilities for the care of other family members all make achievement in school more difficult. To identify student with gifts:

- Use alternative assessment, teacher nomination, and creativity tests.
- Be sensitive to cultural differences in values about cooperative or solitary achievement (Ford, 2000).
- Use multicultural strategies to encourage both achievement and the development of racial identities.

Teaching only for those goals not yet reached. The time saved can be used for learning goals that include enrichment, sophistication, and novelty (Reis & Renzulli, 2004). I look at Table 4.14 to see examples of how content can be modified through acceleration, enrichment, sophistication, and novelty.

Many people object to acceleration, but most careful studies indicate that truly gifted students who begin primary, elementary, middle, high school, college, or even graduate school early do as well as, and usually better than, nongifted students who are progressing at the normal pace. Social and emotional adjustment does not appear to be impaired. Gifted students tend to prefer the company of older playmates and may be miserably bored if kept with children of their own age. Skipping grades may not be the best solution for a particular student, but it does not deserve the bad reputation it has received (Jones & Southern, 1991; Kulik & Kulik, 1984; Richardson & Benbow, 1990). An alternative to skipping grades is to accelerate students in one or two particular subjects or allow concurrent enrollment in advanced placement courses, but keep them with peers for most classes (Robinson & Clinkenbeard, 1998). For students who are extremely advanced intellectually (for example, those scoring 160 or higher on an individual intelligence test), the only practical solution may be to accelerate their education (Hardman, Drew, & Egan, 2005; Hunt & Marshall, 2002).

Teaching methods for gifted students should encourage abstract thinking (formal operational thought), creativity, reading of high-level and original texts, and independence, not just the learning of greater quantities of facts. One approach that does not seem promising with gifted students is cooperative learning in mixed-ability groups. Gifted students tend to learn more when they work in groups with other high-ability peers (Fuchs, Fuchs, Hamlett, & Karns, 1998; Robinson & Clinkenbeard, 1998). In working with gifted and talented students, a teacher must be imaginative, flexible, tolerant, and unthreatened by the capabilities of these students. The teacher must ask: What do these children need most? What are they ready to learn? Who can help me to challenge them? Challenge and support are critical for all students. But challenging students who know more than anyone else in the school about history or music or science or math can be a challenge! Answers might come from faculty members at nearby colleges, retired professionals, books, museums, or older students. Strategies might include summer institutes; courses at nearby colleges; classes with local artists, musicians, or dancers; independent research projects; selected classes in high school for younger students; honors classes; and special-interest clubs (Mitchell, 1984).
In the midst of providing challenge, don't forget the support. We all have seen the ugly sights of parents, coaches, or teachers forcing the joy out of their talented students by demanding practice and perfection beyond the child's interest. Just as we should not force children to stop investing in their talent ("Oh, Michaelangelo, quit fooling with those sketches and go outside and play"), we also should avoid destroying intrinsic motivation with heavy doses of pressure and external rewards.

This has been a brief, selective look at the needs of children. If you decide that students in your class might benefit from special services of any kind, the first step is making a referral. How would you begin? Table 4.15 guides you through the referral process. In Chapter 12, when we discuss effective teaching, we will look at more ways to reach all your students.

### Diversity and Convergences in Learning Abilities

#### Diversity

Even though there are many good tests and careful procedures for making special education placement decisions, racial and ethnic minority students are overrepresented in the disability categories and underrepresented in gifted programs. For example, almost 26% of all students defined as having disabilities under IDEA are African American, but only 15% of all students are African American. The overrepresentation is worse when we look at specific categories: 34% of all students identified as having intellectual disabilities/mental retardation and 27% of students identified as having emotional disturbance are African American—twice as many as we would expect based on the percentage of African American students in the United States. And these students are more likely than White or Asian students to be placed outside of the general education system for most of their school day. In contrast, African American and Latina/o students...
make up only about 8% each of the students served in gifted and talented programs (Friend, 2006).

For almost four decades, educators have struggled to understand the causes of these over- and underrepresentations. Explanations include the higher poverty rates among African American and Latina/o families, which lead to poorer prenatal care, nutrition, and health care; systematic biases in teachers' attitudes, curriculum, instruction, and the referral process itself; and lack of preparation for teachers to work effectively with ethnic minority students (Friend, 2006). To deal with the referral problem, educators have recommended gathering more information about a student before a formal referral is made. How long has the student been in the United States? What about proficiency with English? Are there unusual stressors such as being homeless? Does the curriculum build on the student's funds of cultural knowledge (Chapter 3)? Is the classroom culturally compatible (Chapter 5) and engaging (Chapter 11)? Is the teacher knowledgeable about and respectful of the student's culture? Can the student's abilities be assessed through alternative approaches such as creativity tests and portfolios or performances (Chapter 15)? Having more knowledge about the student and his or her circumstances outside of school should help teachers make better decisions about what programs are appropriate (Friend, 2006; Gonzales, Brusca-Vega, & Yawkey, 1997; National Alliance of Black School Educators, 2002). In fact, instruction should be differentiated to better match the needs of all students, as we will see in Chapter 13.

Convergences

This chapter is about diversity—the many differences among individuals in abilities and disabilities, learning styles and preferences, strengths and challenges. But even with this diversity, differences among individuals are very small compared to all the characteristics we share. Take race for example. For any two humans chosen at random, an average of only .012% (about one one-hundredth of one percent) of the alphabetic sequence of their genetic codes is different due to race (Myers, 2005).

Another convergence should be in the uses of testing. We saw that intelligence tests originally were developed, in part, to protect the rights of children from poorer families who might be denied an education on the false grounds that they weren't able to learn. We also saw that intelligence tests predict school success similarly for students of different races and income levels. Even so, these tests can never be free of cultural content, so they always will have some biases built in. Keep this in mind when you see your students' scores on any test. Finally, remember that the results of every assessment for every student should be used to support that student's learning and development and to identify effective practices, not to deny the student resources or appropriate teaching.

### SUMMARY TABLE

<table>
<thead>
<tr>
<th>Intelligence (pp. 110–121)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the advantages of and problems with labels? Labels and diagnostic classifications of exceptional students can easily become both stigmas and self-fulfilling prophecies, but they can also open doors to special programs and help teachers develop appropriate instructional strategies.</td>
</tr>
<tr>
<td>What is person-first language? “Person-first” language (“students with intellectual disabilities,” “students placed at risk,” etc.) is an alternative to labels that describe a complex person with one or two words, implying that the condition labeled is the most important aspect of the person. With person-first language, the emphasis is on the students first, not on the special challenges they face.</td>
</tr>
<tr>
<td>Distinguish between a disability and a handicap. A disability is an inability to do something specific such as see or walk. A handicap is a disadvantage in certain situations. Some disabilities lead to handicaps, but not in all contexts. Teachers must avoid imposing handicaps on disabled learners.</td>
</tr>
<tr>
<td>What is g? Spearman suggested there is one mental attribute, which he called g or general intelligence, that is used to</td>
</tr>
</tbody>
</table>

154 Chapter 4: Learner Differences and Learning Needs
perform any mental test, but that each test also requires some specific abilities in addition to g. A current version of the general plus specific abilities theory is Carroll’s work identifying a few broad abilities (such as learning and memory, visual perception, verbal fluency) and at least 70 specific abilities. Fluid and crystallized intelligence are two of the broad abilities identified in most research.

What is Gardner’s view of intelligence and his position on g?
Gardner contends that an intelligence is a biological and psychological potential to solve problems and create outcomes that are valued by a culture. These intelligences are realized to a greater or lesser extent as a consequence of the experiential, cultural, and motivational factors in a person’s environment. The intelligences are: linguistic, musical, spatial, logical-mathematical, bodily-kinesthetic, interpersonal, intrapersonal, naturalist, and perhaps existential. Gardner does not deny the existence of g, but questions how useful it is as an explanation for human achievements. The concept of emotional intelligence, or EQ, is similar to Gardner’s intrapersonal and interpersonal intelligences.

What are the elements in Sternberg’s theory of intelligence?
Sternberg’s triarchic theory of intelligence is a cognitive process approach to understanding intelligence: Analytic/componential intelligence involves mental processes that are defined in terms of components: metacomponents, performance components, and knowledge-acquisition components. Creative/experiential intelligence involves coping with new experiences through insight and automaticity. Practical/contextual intelligence involves choosing to live and work in a context where success is likely, adapting to that context, and reshaping it if necessary. Practical intelligence is made up mostly of action-oriented tacit knowledge learned during everyday life.

How is intelligence measured, and what does an IQ score mean? Intelligence is measured through individual tests (Stanford-Binet, Wechsler, etc.) and group tests (Cognitive Abilities Test, Analysis of Learning Potential, School and College Ability Tests, etc.). Compared to an individual test, a group test is much less likely to yield an accurate picture of any one person’s abilities. The average score is 100. About 68% of the general population will earn IQ scores between 85 and 115. Only about 16% of the population will receive scores below 85 or above 115. These figures hold true for White, native-born Americans whose first language is Standard English. Intelligence predicts success in school, but is less predictive of success in life when level of education is taken into account.

What is the Flynn effect and what are its implications?
Since the early 1900s, IQ scores have been rising. To keep 100 as the average for IQ test scores, questions have to be made more difficult. This increasing difficulty has implications for any program that uses IQ scores as part of the entrance requirements. For example, students who were not identified as having intellectual disabilities a generation ago might be identified as disabled now because the test questions are harder.

Exceptional students Students who have abilities or problems so significant that they require special education or other services to reach their potential.
Disability The inability to do something specific such as walk or hear.
Handicap A disadvantage in a particular situation, sometimes caused by a disability.
Intelligence Ability or abilities to acquire and use knowledge for solving problems and adapting to the world.
Fluid intelligence Mental efficiency, nonverbal abilities grounded in brain development.
Crystallized intelligence Ability to apply culturally approved problem-solving methods.
Theory of multiple intelligences In Gardner’s theory of intelligence, a person’s eight separate abilities: logical-mathematical, linguistic, musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist.
Emotional intelligence (EQ) The ability to process and use emotional information accurately and efficiently.
Triarchic theory of successful intelligence A three-part description of the mental abilities (thinking processes, coping with new experiences, and adapting to context) that lead to more or less intelligent behavior.
Insight The ability to deal effectively with novel situations.
Automaticity The result of learning to perform a behavior or thinking process so thoroughly that the performance is automatic and does not require effort.
Tacit knowledge Knowing how rather than knowing that—knowledge that is more likely to be learned during everyday life than through formal schooling.
Mental age In intelligence testing, a performance that represents average abilities for that age group.
Intelligence quotient (IQ) Score comparing mental and chronological ages.
Deviation IQ Score based on statistical comparison of an individual’s performance with the average performance of others in that age group.
Flynn effect Because of better health, smaller families, increased complexity in the environment, and more and better schooling, IQ test scores are steadily rising.

Ability Differences and Teaching (pp. 121–124)
What are the problems with between-class ability grouping?
Academic ability groupings can have both disadvantages and advantages for students and teachers. For low-ability students, however, between-class ability grouping generally has a negative
effect on achievement, social adjustment, and self-esteem. Teachers of low-achievement classes tend to emphasize lower-level objectives and routine procedures, with less academic focus. Often, there are more student behavior problems, increased teacher stress, lowered expectations, and decreased enthusiasm. Ability grouping can promote segregation within schools.

What are the alternatives available for grouping in classes, including flexible grouping? Cross-age grouping by subject can be an effective way to deal with ability differences in a school. Within-class ability grouping, if handled sensitively and flexibly, can have positive effects, but alternatives such as cooperative learning may be better.

**Between-class ability grouping/tracking** System of grouping in which students are assigned to classes based on their measured ability or their achievements.

**Untracking** Redesigning schools to teach students in classes that are not grouped by ability.

**The Joplin Plan/nongraded elementary school** Arrangement wherein students are grouped by ability in particular subjects, regardless of their ages or grades.

**Within-class ability grouping** System of grouping in which students in a class are divided into two or three groups based on ability in an attempt to accommodate student differences.

**Flexible grouping** Grouping and regrouping students based on learning needs.

### Learning Styles and Preferences (pp. 124–127)

**Distinguish between learning styles and learning preferences.** Learning styles are the characteristic ways a person approaches learning and studying. Learning preferences are individual preferences for particular learning modes and environments. Even though learning styles and learning preferences are not related to intelligence or effort, they can affect school performance.

**Should teachers match instruction to individual learning styles?** Results of some research indicate that students learn more when they study in their preferred setting and manner, but most research does not show a benefit. Many students would do better to develop new—and perhaps more effective—ways to learn.

**What learning style distinctions are the most well-supported by research?** One distinction that is repeatedly found in research is deep versus surface processing. Individuals who have a deep-processing approach see the learning activities as a means for understanding some underlying concepts or meanings. Students who take a surface-processing approach focus on memorizing the learning materials, not understanding them. A second is Mayer’s visualizer–verbalizer dimension that it has three facets: cognitive spatial ability (low or high), cognitive style (a visualizer vs. a verbalizer), and learning preference (a verbal learner vs. a visual learner).

**Learning styles** Characteristic approaches to learning and studying.

**Learning preferences** Preferred ways of studying and learning, such as using pictures instead of text, working with other people versus alone, learning in structured or unstructured situations, and so on.

### Individual Differences and the Law (pp. 127–130)

**Describe the main legal requirements that pertain to students with disabilities.** Beginning with Public Law 94-142 (1975) and continuing with many reauthorizations including the Individuals with Disabilities Education Improvement Act (2004), the requirements for teaching students with disabilities are spelled out. Each exceptional learner or student with special needs (zero reject) should be educated in the least restrictive environment according to an individualized education program (IEP). The laws also protect the rights of students with special needs and their parents. In addition, Section 504 of the Vocational Rehabilitation Act of 1973 prevents discrimination against people with disabilities in any program that receives federal money, such as public schools. Through Section 504, all school-age children are ensured an equal opportunity to participate in school activities. The definition of “disability” is broad in Section 504 and in the Americans with Disabilities Act.

**Individuals with Disabilities Education Improvement Act (IDEIA)** Latest amendment of PL 94-142, guarantees a free public education to all children regardless of disability.

**Zero reject** A basic principle of IDEIA specifying that no student with a disability, no matter what kind or how severe, can be denied a free public education.

**Individualized Education Program (IEP)** Annually revised program for an exceptional student, detailing present achievement levels, goals, and strategies, drawn up by teachers, parents, specialists, and (if possible) the student.

**Least Restrictive Environment (LRE)** Educating each child with peers in the regular classroom to the greatest extent possible.

**Mainstreaming** Teaching children with disabilities in regular classes for part or all of their school day.

**Integration** Fitting the child with special needs into existing class structures.

**Inclusion** The integration of all students, including those with severe disabilities, into regular classes.

**Section 504** A part of civil rights law that prevents discrimination against people with disabilities in programs that receive federal funds, such as public schools.

**Americans with Disabilities Act of 1990 (ADA)** Federal legislation prohibiting discrimination against persons with disabilities in employment, transportation, public access, local government, and telecommunications.
The Most Common Challenges (pp. 130–145)

What is a learning disability? Specific learning disabilities are disorders in one or more of the basic psychological processes involved in understanding or using spoken or written language. Listening, speaking, reading, writing, reasoning, or mathematical abilities might be affected. These disorders are intrinsic to the individual, presumed to be the result of central nervous system dysfunction, and may occur across the life span. Students with learning disabilities may become victims of learned helplessness when they come to believe that they cannot control or improve their own learning and therefore cannot succeed. A focus on learning strategies often helps students with learning disabilities.

What is ADHD and how is it handled in school? Attention-deficit hyperactivity disorder (ADHD) is the term used to describe individuals of any age with hyperactivity and attention difficulties. Use of medication to address ADHD is controversial, but currently on the rise. For many students there are negative side effects. In addition, little is known about the long-term effects of drug therapy. There also is no evidence that the drugs lead to improvement in academic learning or peer relationships. Two promising approaches are behavior modification and techniques that combine motivational training with instruction in learning and memory strategies. The SMART approach that focuses on the abilities of children is another possibility.

What are the most common communication disorders? Communication disorders include speech impairments (articulation disorders, stuttering, and voicing problems) and oral language disorders. If these problems are addressed early, great progress is possible.

What defines intellectual disabilities? Before age 18, students must score below about 70 on a standard measure of intelligence and must have problems with adaptive behavior, day-to-day independent living, and social functioning.

What are the best approaches for students with emotional and behavioral disorders? Methods from applied behavioral analysis and direct teaching of social skills are two useful approaches. Students also may respond to structure and organization in the environment, schedules, activities, and rules.

What are some warning signs of potential suicide? Students at risk of suicide may show changes in eating or sleeping habits, weight, grades, disposition, activity level, or interest in friends. They sometimes suddenly give away prized possessions such as stereos, CDs, clothing, or pets. They may seem depressed or hyperactive and may start missing school or quit doing work. It is especially dangerous if the student not only talks about suicide, but also has a plan for carrying it out.

Less Prevalent Problems/More Severe Disabilities (pp. 145–148)

How can schools accommodate the needs of students with physical disabilities? If the school has the necessary architectural features, such as ramps, elevators, and accessible rest rooms, and if teachers allow for the physical limitations of students, little needs to be done to alter the usual educational program. Identifying a peer to help with movements and transitions can be useful.

How would you handle a seizure in class? Do not restrain the child’s movements. Lower the child gently to the floor, away from furniture or walls. Move hard objects away. Turn the child’s head gently to the side, put a soft coat or blanket under the student’s head, and loosen any tight clothing. Never put anything in the student’s mouth. Find out from the student’s parents how they deal with seizures. If one seizure follows another and the student does not regain consciousness in between, if the student is pregnant, or if the seizure goes on for more than 5 minutes, get medical help right away.

What are some signs of hearing and visual impairment? Signs of hearing problems are turning one ear toward the speaker, favoring one ear in conversation, or misunderstanding conversation when the speaker’s face cannot be seen. Other indications include not following directions, seeming distracted or confused at times, frequently asking people to repeat what they have said, mispronouncing new words or names, and being reluctant to participate in class discussions.
Take note particularly of students who have frequent earaches, sinus infections, or allergies. Holding books very close or far away, squinting, rubbing eyes, misreading the chalkboard, and holding the head at an odd angle are possible signs of visual problems.

**How does autism differ from Asperger syndrome?** Asperger syndrome is one of the autism spectrum disorders. Many students with autism also have moderate-to-severe intellectual disabilities, but those with Asperger syndrome usually have average-to-above-average intelligence and better language abilities than other children with autism.

- **Cerebral Palsy** Condition involving a range of motor or coordination difficulties due to brain damage.
- **Spasticity** Overly tight or tense muscles, characteristic of some forms of cerebral palsy.
- **Epilepsy** Disorder marked by seizures and caused by abnormal electrical discharges in the brain.
- **Generalized seizure/tonic-clonic seizure** A seizure involving a large portion of the brain.
- **Absence seizure** A seizure involving only a small part of the brain that causes a child to lose contact briefly.
- **Low vision** Vision limited to close objects.
- **Educationally blind** Needing Braille materials in order to learn.
- **Autism/Autism Spectrum Disorders** Developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3 and ranging from mild to major.

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**Students Who Are Gifted and Talented**

(pp. 148–153)

**What are the characteristics of gifted students?** Gifted students learn easily and rapidly and retain what they have learned; use common sense and practical knowledge; know about many things that the other children don’t; use a large number of words easily and accurately; recognize relations and comprehend meanings; are alert and keenly observant and respond quickly; are persistent and highly motivated on some tasks; and are creative or make interesting connections. Teachers should make special efforts to support underrepresented gifted students—girls, students who also have learning disabilities, and children living in poverty.

**Is acceleration a useful approach with gifted students?** Many people object to acceleration, but most careful studies indicate that truly gifted students who are accelerated do as well as, and usually better than, nongifted students who are progressing at the normal pace. Gifted students tend to prefer the company of older playmates and may be bored if kept with children their own age. Skipping grades may not be the best solution for a particular student, but for students who are extremely advanced intellectually (with a score of 160 or higher on an individual intelligence test), the only practical solution may be to accelerate their education.

Gifted student: A very bright, creative, and talented student.
Teachers’ Casebook: Connections to PRAXIS II®

Over the school year, teachers make thousands of decisions based on knowledge of intelligence, academic ability, grouping practices, learning disabilities, giftedness, physical disabilities, mandates and federal legislation. In fact, most licensure exams, including PRAXIS II®, will require you to be knowledgeable about these topics.

What Would They Do?

Here is how some practicing teachers responded to the wide range of abilities and disabilities in the class described at the beginning of the chapter.

Deborah P. Reed
Darien Woods Elementary School, Galloway, OH

Thomas G. Reed
Boone Grove High School, Columbus, OH

Structuring a standards-based program for diverse learners requires careful consideration of the needs of each student. To ensure the success of students with special needs, it is important to plan lessons that accommodate various learning styles and abilities. Here are some strategies that can be implemented in a classroom setting:

1. Differentiated Instruction: Tailor instruction to meet the needs of individual students. This can be achieved by adjusting the content, process, or product of instruction. For example, students who are struggling with reading comprehension can be provided with additional support, such as reading aloud or using visual aids.

2. Flexible Grouping: Organize students into smaller groups based on their learning needs. This allows for more focused instruction and provides opportunities for peer collaboration.

3. Technology Integration: Incorporate technology into daily instruction to enhance learning and engagement. Tools such as interactive software, educational apps, and online resources can be used to support diverse learners.

4. Multisensory Teaching: Engage students' senses to improve retention and understanding. Activities that involve movement, drawing, and auditory elements can be particularly effective for students with diverse learning styles.

5. Regular Assessment: Monitor student progress regularly and adjust instruction accordingly. Formative assessments, such as informal observations and checklists, can provide valuable insights into student learning.

Randall G. Sampson, Assistant-Principal,
Galloway Middle School, Galloway, OH

The educational leader (principal/administrative) must provide an academic assessment for a learning disability. The matrix provides teachers with a list of individual needs as prescribed by standardized test scores. The matrix can instantly promote teachers with the necessary academic performance data. In order to better and more effectively meet the academic needs of the students, such a matrix teachers would be able to provide a more personalized learning experience while seeking specific instructional strategies for each student. Such a matrix is essential for identifying and providing for the needs of all students as mandated by the 2005 No Child Left Behind Act, and meeting the criteria for Annual Yearly Progress.

W. Sean Kearney, Former Assistant Principal,
Galen R. Elam Elementary School, Converse, TX

Know the why and seek additional training if necessary. Students with special educational needs have an individualized education plan (IEP) that must be followed. Public schools cannot be excluded from the classroom; once you understand the specific needs of your students, the teaching and learning can begin. If not offered by your district, seek out training or resources outside of your district. Your teaching will impact the quality of the education you will be able to deliver to your students. Finally, work with colleagues. This is a new district-wide policy, and the other teachers on your grade level are subject to the same lesson. Work together throughout the year to integrate lessons and topic standards into your work.

Felicia Lowman-Sikes, Kindergarten Teacher,
Meadowsview Elementary School, Meadowsview, VA

I use classroom space to carry out lessons in different ways. This addresses the differences in learning styles of students while allowing them to participate in the lesson together. I have four different centers in my room: one that students rotate through, speaking in groups of five in each center. In my library center, the books are shelved in reading level, which allows students to be grouped with students who need to work on similar skills. In the phonics center, children are given a hands-on activity to help learn letter sounds, such as sorting pictures based on beginning sounds using animal cards. When students go to the sensory center, they use small-world play, which helps them with special needs to illustrate a picture describing the world of the day instead of writing and reading these words in sentences. They may also spend time making picture dictionaries. Finally, students are involved in weekly meetings and work on any tasks that have yet to be mastered. I use all of the materials to provide small groups in a small, visual setting, and then whole class time. Parents and students who are scheduled to work in a corresponding small group will be able to continue this in the needs of math, science, and social studies lessons as well.