Students with Learning Disabilities
INTRODUCING JUSTIN

Justina 7-year-old boy who is currently in the second grade. His mother reports that she had a difficult pregnancy with Justin, who was born a month prematurely. She also states that Justin was somewhat delayed in language skills and milestones compared to her memory of his older brother’s development. For example, Justin’s brother said his first word right before his first birthday whereas Justin didn’t say his until he was almost 18 months old. Justin received speech therapy for an articulation problem beginning at age 4 that continued through kindergarten. In the first grade he struggled with reading but stayed on grade level with the help of a tutor.

Justin’s second-grade teacher, Ms. Phillips, initially noted that Justin was having difficulty with phonics skills and that his handwriting was not legible. She also reported that he is disorganized, often losing or misplacing his assignments. When Justin does his work, he loses interest part way through and usually does not finish it. When he stops doing his work, he will often tap his pencil and make mouth noises, distracting the other students.

Justin’s school implements the response to intervention (RTI) model schoolwide. Subsequently, early in the school year all second-grade students were given a brief screening. In Ms. Phillips’s class, three students, including Justin, were targeted as needing additional instruction. Although this was successful for one student, Suzie, Justin and the other student, Carlos, continued to struggle. The special education teacher, Mr. Mayer, consulted with Ms. Phillips and suggested some research-supported learning strategies for her to implement. Carlos responded favorably to the strategies, but Justin didn’t. At that point, Mr. Mayer came into the classroom and worked directly with Justin. This also proved to be unsuccessful, and based on this information Ms. Phillips decided that a referral for special education services was warranted. Justin’s parents have expressed a preference for keeping him in the general education classroom.
Ms. Phillips is faced with a question that many teachers must ask—when is a student just temporarily struggling academically and when are the school problems a result of a disability? In Justin’s case, the RTI approach demonstrated that Justin struggled through several stages of intervention, which helped answer that question. As you will see, Justin displays many characteristics of a student with a learning disability, such as problems with reading and writing. However, there is no prototype for a child with learning disabilities. For example, Ginny, a fourth grader, is an avid reader but has great difficulty in mathematics. Brandon, who just started middle school and is a member of the math team, is having problems in written expression and frequently turns in short written products with numerous errors in spelling, punctuation, and capitalization. Ginny and Brandon both have been identified as having a learning disability.

The majority of students with learning disabilities are taught in the general education classroom. As a general education teacher, you may be involved in helping to identify a learning disability or in ruling one out through a prereferral program. As a special education teacher, you will most likely collaborate with the general education teacher to provide learning supports to any students with learning disabilities. You might also work with them in a pullout program for part of the day or, less likely, teach them in a separate classroom. For both special and general education teachers, we want to emphasize that many of the instructional considerations and suggestions provided in this chapter can be applied to students identified with other disabilities or students who are not identified with a disability but who may need some additional instructional support.

This chapter follows a format you will find in each of the remaining chapters. The first half of the chapter focuses on the basic information about the exceptionality that you as a teacher need to understand: the history, definition, prevalence, causes, characteristics, and identification procedures. The second half explores the educational implications and offers suggestions in the areas of instructional content, instructional procedures, the instructional environment, and instructional technology. Finally, we identify some special considerations for the general education teacher.

What Are the Foundations of Learning Disabilities?

Although the term learning disabilities was not used until the early 1960s, the historical roots of learning disabilities go back more than 200 years. It is important to look at these historical roots to see how the disability has evolved from being considered a medical to an educational condition. Along with the development of an understanding of learning disabilities has been the evolution of its definition. There has been considerable debate about what a learning disability actually is. Frequently, in fact, a learning disability is defined by what it is not, such as a learning problem not due to sensory deficits or environmental disadvantage. Learning disabilities is currently the most prevalent disability, with almost half of all students receiving services under IDEA 04 being identified with a learning disability. You will most likely work with many students with learning disabilities during your teaching career.

A Brief History of Learning Disabilities

The history of what we now call learning disabilities began more than two centuries ago and was firmly implanted in a medical model. Wiederholt (1974), in a classic chapter about the history of learning disabilities, identified four distinct periods in how learning disabilities have been understood. The foundational phase (1800–1930) emphasized basic scientific research related to the brain. During this period, the relationship of injury to specific areas of the adult brain and the corresponding loss of specific functions, such as language skills or perceptual skills, was investigated. Researchers such as Kurt Goldstein, who studied World War I head injury patients,
found that many patients displayed characteristics that would later be associated with learning disabilities. These characteristics include perseveration, in which an individual starts an activity but has difficulty stopping or changing it; hyperactivity; and figure/ground problems, in which an individual is unable to perceptually shift from foreground to background as when viewing the classic picture of the vase and the faces (Figure 4.1). The early conceptions of learning disabilities developed during this period emphasized their perceptual nature.

The transition phase (1930–1960) marked the application of brain research to the study of children. In the early 1940s, for example, Heinz Werner and Alfred Strauss began to bring the field of neurology into education. They noticed similarities between some of the characteristics of children who were having learning problems and those of adults who had suffered brain injury. This observation led to terms such as minimal brain injury and minimal brain dysfunction, which were early labels used for learning disabilities.

The integration phase (1960–1974) included coining the term learning disability (see An Important Event) and recognition of learning disabilities within school programs. Emphasis was placed on perceptual skills and their role in children’s learning in the early stages of the integration phase through the work of researchers such as William Cruickshank, Newell Kephart, and Marianne Frostig. Although the views developed during this period emphasized the perceptual nature of learning disabilities, which later proved to be flawed, they did stimulate more research about, and interest in, the nature of learning disabilities.

**AN IMPORTANT EVENT**

**1963—Dr. Sam Kirk Coins the Term Learning Disabilities**

On April 6, 1963, Dr. Sam Kirk delivered a speech sponsored by the Fund for Perceptually Handicapped Children to a group of parents. Ironically, the message Dr. Kirk wanted to deliver was that labeling children with terms such as perceptually handicapped, brain injured, or autistic was satisfying for caring adults but did little to actually help the child. He argued that labels were classification terms that added little diagnostic information that would assist in “treatment, management, or remediation.” He went on to say, however, that he had recently been using the term learning disabilities to refer to children who were experiencing problems in language, speech, reading, and communication skills. (Kirk had coined this term in his introductory (continued)
Finally, the current phase (1975 to the present) is a time of emerging and future directions in the field of learning disabilities. We now emphasize interventions focusing on academic, behavioral, cognitive, and language areas. The majority of research today is on what strategies and supports can be provided to help students with learning disabilities achieve academically within the general education curriculum.

Definitions of Learning Disabilities

The development of learning disabilities as a category of disability was initially a reaction to the existence of a large number of children who were having a broad range of problems progressing academically, but who otherwise had no observable disabilities. The current federal definition of learning disabilities outlined in IDEA 04 is the most widely used, although the definition proposed by the National Joint Committee on Learning Disabilities (NJCLD) is commonly referenced. The definition used in practice varies from state to state.

**The IDEA 04 Definition**

Since the time of Kirk's influential speech, the definition of a learning disability has been constantly analyzed. Currently, the definition of learning disabilities originally proposed by the National Advisory Committee on Handicapped Children in 1968, updated by the federal government for PL 94-142 and, most recently, revised for the Individuals with Disabilities Education Act of 2004 (IDEA 04), is the most widely accepted. That definition is as follows:

**General**—Specific learning disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

**Disorders Not Included**—Specific learning disability does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

This definition is sufficiently broad so that a variety of students might be considered as having a learning disability. It also includes both inclusion criteria, for example, the disability can be due to brain injury or dyslexia, and exclusion criteria, such as the disability cannot be due to emotional disturbance or environmental disadvantage.

**The NJCLD Definition**

In addition to the IDEA 04 definition of learning disabilities, teachers should be aware of the definition proposed by the National Joint Committee on Learning Disabilities (NJCLD, 1997), an organization consisting of 13 professional organizations including the Council for Learning Disabilities and the International Reading Association. The NJCLD definition

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**IMPORTANT EVENT (continued)**

special education textbook published in 1962; this meeting, however, popularized it.) He further stated that these children were neither blind nor deaf, nor did they have mental retardation. His statements had a significant effect. That evening, the parent advocacy organization eventually known as the Learning Disabilities Association of America (LDA), was founded. Dr. Kirk was appointed Chair of the Advisory Board. He, in turn, appointed to the board some of the major leaders in what was to become the field of learning disabilities.

**REFLECTION** Why do you think Dr. Kirk’s speech had such an impact on the parents at that meeting?
is frequently used and has both similarities to and differences from the federal definition. Both the NJCLD and IDEA define learning disabilities as involving deficits in a number of academic and cognitive areas. The NJCLD definition eliminated the psychological processing deficit requirement and redefined the exclusion aspect of the IDEA definition by stating that a learning disability cannot be the result of other disabilities or extrinsic factors, but that they can coexist. Although the NJCLD definition was not adopted by Congress, it represents the concerns that professionals had, and still have, with the federal definition.

**Prevalence of Learning Disabilities**

Approximately 5% of school-aged children have been identified as having a learning disability. In the 2005 school year, 5.24% of all students ages 6–17 received learning disabilities services under IDEA 04 (Office of Special Education Programs [OSEP], 2006). Learning disabilities is the largest area of disability, constituting over 45% of all students served under IDEA 04, and it has demonstrated considerable growth over time, probably due to increased awareness and the reclassification of students with other disabilities, such as mental retardation, into the learning disability category. Thinking about this information practically, in a typical class of 30 students, one or two will be identified as having a learning disability.

Factors such as gender, ethnic background, and geographic region appear to affect the prevalence rate of learning disabilities. It is generally accepted that more boys are identified with learning disabilities than girls, with three to four times more boys receiving services for learning disabilities than girls. Regarding ethnic background, several states have shown a rather dramatic underrepresentation of African American students with learning disabilities (Colarusso, Keel, & Dangel, 2001), but these same states have an overrepresentation of African American students identified with having intellectual disabilities.

The prevalence rate of learning disabilities, in general, also varies according to geographic region. Recent IDEA 04 data indicated that the percentage of students with learning disabilities by state ranged from 2.12% to 7.7% for students ages 6–17 (OSEP, 2006). It is unclear why this variability exists, but it is probably due to the different criteria used for identification.

**Check Your Understanding**

1. What are the four historical periods of learning disability research/education and their characteristics?
2. What was the focus of early research on what would eventually become the field of learning disabilities?
3. What is the IDEA 04 definition of learning disabilities?
4. How does the NJCLD definition differ from the IDEA 04 definition?
5. Approximately what percentage of the school population has a learning disability? What percentage of all students with a disability have a learning disability?
6. What factors appear to affect the prevalence of learning disabilities?

**What Are the Causes and Characteristics of Learning Disabilities?**

There is no consensus on the specific cause or causes of learning disabilities. In fact, the range of characteristics leads to a variety of possible causes. While the broadness of the learning disabilities definition has led to a range of possible causes and characteristics, this section focuses on those most often identified.
Chapter 4 Students with Learning Disabilities

Causes of Learning Disabilities

The search for causes of learning disabilities has, and most likely will continue to have, very broad parameters. The causes most often recognized and researched today can be grouped into neurological, genetic, and environmental factors. Although these areas do not represent every possible cause, they provide a solid foundation for understanding identified causes.

Neurological Causes

Implicit in the IDEA 04 definition of learning disabilities is that the problem is in some way neurological in nature; in other words, it is related to a deficit in the central nervous system. These deficits could be due to brain injury, brain development, or brain structure. Minimal brain injury, one of the early terms used for learning disabilities, suggested a loss of brain functioning due to damage. Research in the mid-20th century proposed that learning disabilities are caused by lags in neurological development as opposed to the loss of neurological function. In other words, the problems are due to a slowly developing brain, not an injured one.

More recently, researchers have been interested in the structural brain differences between individuals with and without learning disabilities. For example, there is evidence that individuals with dyslexia, a severe reading disability, have a smaller planum temporale, a section of the temporal lobe of the brain, than do individuals without dyslexia (Miller, Sanchez, & Hynd, 2003). Advances in medical technology, such as the development of functional magnetic resonance imaging (fMRI), which makes it possible to determine which part of the brain is actively engaged when an individual is involved in a learning task, have led to improved techniques to search for neurological causes. For example, research has shown that individuals with reading and language disabilities show different brain activation patterns during specific tasks than do individuals without disabilities (Richards, 2001).

Genetic Causes

One often-debated issue is the possibility of a genetic basis of learning disabilities. As early as 1905, Hinshelwood noted a familial relationship of individuals with learning problems. There is, in fact, some evidence of this from twin studies. For example, reading problems have been more frequently reported between identical twins than between fraternal twins (Wadsworth, Olson, Pennington, & DeFries, 2000). There have also been reports that the prevalence of dyscalculia, a severe math disability, is 10 times higher in families of individuals with the problem than would be expected from the general population (Shalev et al., 2001) and that word recognition problems have a primarily genetic basis (Harlaar, Spinath, Dale, & Plomin, 2005).

Environmental Causes

Research has also provided evidence that environmental factors can cause learning disabilities. These environmental factors are grouped into those that occur prenatally, perinatally, and postnatally. Prenatal factors known to harm a fetus include maternal drug use, alcohol consumption, and smoking during pregnancy. Maternal use of drugs and alcohol during pregnancy is usually associated with more severe problems than learning disabilities, such as fetal alcohol syndrome. However, their use can result in various degrees of disability, depending on the amount of alcohol or other drugs consumed, and when or how long they were consumed during the pregnancy. Mothers who smoke during pregnancy are more likely to have smaller babies (under 5 pounds) who are subsequently at risk for a number of problems including learning disorders (National Institute of Mental Health, 2001).

Perinatal factors that cause learning disabilities occur at birth or very shortly thereafter. Complications during child delivery, such as the umbilical cord becoming twisted, could lead to anoxia, the loss of oxygen, which in turn may lead to a learning disability. It is also possible that some slight injury may occur to the brain as the child passes through the birth canal. Again, these factors can lead to more severe problems as well.
Postnatal factors that cause learning disabilities occur after the child is born. Several postnatal factors have been linked to learning disabilities. Essentially, any factor that can cause neurological problems can cause learning problems. These include medical conditions such as meningitis, as well as the ingestion of certain substances, such as lead-based paint, known to cause brain damage. Although lead-based paint is now banned, lead is still found in some water pipes, with estimates that as many as 890,000 young children develop lead poisoning each year (Cohen, 2001). In 2007, there was a large recall of toys by a major company because of their lead content. Some of the more controversial causes suggested in the early history of the field were related to postnatal factors (Table 4.1). We mention these because you might hear about them, but there is little to no research to support their influence.

Although environmental, cultural, and economic disadvantage are excluded as causes of learning disabilities in the IDEA 04 definition, a few states have eliminated this exclusionary component (Kidder-Ashley, Deni, & Anderton, 2000). It is thus likely that many students are identified as having a learning disability whose problems are at least associated with these factors. For example, low socioeconomic status and poverty have long been linked to learning problems (Arends, 2007).

### Characteristics of Students with Learning Disabilities

There have been many attempts to identify the major characteristics of students with learning disabilities. One of the earliest studies in this area was made in 1963 by a task force that was assembled on the recommendation of the federal government and concerned agencies. The task force identified 10 commonly exhibited characteristics of minimal brain dysfunction/learning disability: (1) hyperactivity, (2) perceptual-motor impairments, (3) emotional lability, (4) general coordination deficits, (5) disorders of attention, (6) impulsivity, (7) disorders of memory and thinking, (8) specific learning disabilities, (9) disorders of speech and hearing, and (10) equivocal neurological signs (Clements, 1966). The task force findings reinforced the neurological basis of learning disabilities. Notice that none of the 10 listed characteristics specifically addressed academic skill deficits. Today both academic and nonacademic characteristics are associated with learning disabilities. These include characteristics related to reading, mathematics, written expression, expressive and receptive language, cognition (including attention, memory, and metacognition), and social/emotional areas. It is important to remember that not all students identified as having a learning disability will have all of these characteristics or display problems in all of these areas.

### Characteristics Related to Reading

Many people are under the impression that the terms learning disability and reading disability are interchangeable. The reality is that some students with learning disabilities do not have difficulty reading. However, a reading problem is the most
frequently reported academic problem for those with learning disabilities with estimates as high as 90% (Bender, 2004). Needless to say, reading is a very important skill that is directly related to overall academic performance. It is no wonder that so much attention has focused on this area. Students with learning disabilities manifested in reading ability may also have problems with phonological awareness, rapid automatic naming, reading recognition, and reading comprehension.

One of the most severe reading problems linked to learning disabilities is dyslexia. Dyslexia is described as having a neurological basis (International Dyslexia Association, 2002) and being resistant to remediation (Hynd, 1992). Therefore, when a child is labeled as having dyslexia, even informally, it suggests some type of biologically based reading problem that cannot be remediated or is difficult to remediate. In reality, reading problems can occur from a variety of causes, and the incidence of “pure” dyslexia is not very high. Bender (2004) stated that less than 1% of individuals with learning disabilities have dyslexia and that the terms reading disability and dyslexia should not be used interchangeably. He further pointed out that the vast majority of reading problems can be effectively remediated.

Problems in reading that might indicate a learning disability related to early reading skills include phonological awareness and rapid automatic naming. **Phonological awareness** is the recognition that words, syllables, or sounds exist in spoken language and can be manipulated by deleting, adding, substituting, and transposing. It manifests itself in the ability (or lack of ability) to break down speech into smaller parts such as sounds or syllables. An individual with a problem in this area might not recognize that “dog” is actually made up of three sounds, d/o/g.

**Rapid automatic naming** is quickly naming stimuli such as digits, letters, or names of simple objects; related to early reading ability.

**Many students with learning disabilities struggle with reading.**

Lewis, Freibairn, and Terry (2000) followed a group of 4- and 6-year-old children with phonological processing problems into the third and fourth grades. They found that these children developed problems in reading decoding (sounding out words), reading comprehension, and spelling. Another important early reading skill is rapid automatic naming (RAN), the ability to quickly name stimuli such as digits, letters, or pictures of simple objects. Research has indicated that young children who have difficulty with RAN also have deficits in reading ability (Bowers & Ishaik, 2003). Research on phonological awareness/processing and RAN is very important because there also is evidence that children who experience reading problems early in life continue to have problems and rarely catch up. The “Matthew effect,” the phenomenon that good readers become better readers and poor readers become poorer readers, has been observed for years (Stanovich, 1986). The Matthew effect reinforces the extreme importance of early reading intervention, one of the goals of the No Child Left Behind Act.

Two other areas in reading in which students with learning disabilities often have problems are in word recognition and reading comprehension. As a group, students with word recognition problems can display a number of characteristics either in isolation or in combination. These include mispronunciations; skipping, adding, or substituting words; reversing letters or words; and difficulty blending sounds together.

While many students with learning disabilities eventually learn word recognition skills, they may still have problems in comprehension. Problems in reading comprehension, understanding what is read, can be due to a number of possible factors including lack of background knowledge, difficulty understanding text structure, and vocabulary deficits (Ehren, 2005; Joshi, 2005). It also follows that a
word recognition problem can cause a comprehension problem (Williams, 2003). For example, if a student comes across unfamiliar vocabulary words and substitutes incorrect words for them, the meaning of the passage will be difficult to determine. Figure 4.2 provides an example of the effects of word substitution on reading comprehension.

**Characteristics Related to Mathematics**
Mathematics is another area in which a student with learning disabilities might experience problems. It is estimated that approximately 25% of students with learning disabilities receive services for mathematics (Miller, Butler, & Lee, 1998; Rivera, 1997), and math problems frequently persist into adulthood (Patton, Cronin, Bassett, & Koppel, 1997). Areas in which students with learning disabilities have been reported as having difficulties include calculation, knowledge of math facts, understanding of math concepts, and problem-solving skills (Smith, 2004). Related areas include difficulty with word problems (Bryant & Dix, 1999), math anxiety (Baloglu & Kocak, 2006), and retrieving math information from long-term memory (Geary, 2003).

**Writing and Written Expression Characteristics**
Students with learning disabilities might have problems with handwriting, spelling, and written language/written expression, such as punctuation, vocabulary, and sentence structure. They also might have problems in more than one of the areas, as they seem to be interrelated. Figure 4.3 shows a writing sample that includes all of the previously mentioned problems.

**Handwriting.** Poor handwriting, a characteristic of some students with learning disabilities, may be related to a number of underlying causes, including poor fine-motor skills, faulty visual perception of letters and words, lack of coordination, the inability to transfer the input of visual information to the output of fine-motor movement, and difficulty remembering visual impressions (Lerner & Kline, 2006). Also, if handwriting is difficult for a student, writing may take longer (Hallahan, Lloyd, Kauffman, Weiss, & Martinez, 2005).

**Spelling.** Spelling is an area in which many students with learning disabilities have considerable difficulty. Some emphasis has been placed on determining the type of spelling...
problem that students demonstrate. For example, Berninger and Amtmann (2003) identified several types of error patterns, each with its own suggested instructional procedures. These included phonological processing errors (\textit{pincess} for \textit{princess}), spelling conventions errors (\textit{busyer} for \textit{busier}), and letter production errors (\textit{maq} for \textit{map}).

\textbf{Written Expression.} Many students with learning disabilities display problems in the overall area of written language or written expression. Problems with handwriting and spelling often lead to difficulty in composing written products (Berninger & Amtmann, 2003; Graham, 1999), and it appears that many students with learning disabilities have more difficulty with compositional writing than with writing single words or sentences (Mayes, Calhoun, & Lane, 2005). Compositional writing involves aspects such as capitalization and punctuation, vocabulary, organization, and theme development. For example, a student with a learning disability in this area might write a story that is short; is not well thought out; and has numerous capitalization, punctuation, and spelling errors.

\textbf{Expressive and Receptive Language Characteristics}  
The importance of language in the field of learning disabilities is well appreciated. In fact, many states have programs specifically for students with language learning disabilities (LLD). Students with learning disabilities in this area might have problems in expressive language (producing language), receptive language (understanding language), or in both. Although students with learning disabilities have problems in both areas compared to normally achieving students, research generally supports the fact that they have greater difficulty with expressive language than with receptive language (Hallahan et al., 2005). It is important to identify language problems because they are directly related to academic areas, particularly reading and written expression. Problems in language at age 5 might show up as reading problems at age 8 and writing problems at age 14 (Lerner & Kline, 2006). Students with learning disabilities can have problems with any of the components of language (discussed in depth in Chapter 7). It should be noted, however, that some students with learning disabilities have strong verbal skills. These students might be identified as having a nonverbal learning disability.

\textbf{Cognitive-Related Characteristics}  
The federal definition of learning disabilities mentions deficits in “thinking.” The general area of thinking, or cognition, is complex and includes a number of specific subareas. The subareas particularly relevant to a discussion of learning disabilities are attention, memory, and strategy use. Another related area is metacognition, an individual’s ability to think about the thinking process. Note that a distinction is made between cognition and intelligence. The IQs of students with learning disabilities vary considerably, from low average to quite high, even into the gifted range.
**Attention.** There are several types of attention problems that students with learning disabilities might demonstrate. A student might have difficulty focusing attention on the task at hand or not be able to attend to the important aspects of a task. A related characteristic that is frequently noted is distractibility. In effect, however, children with attention problems might attend to very little, whereas children who are distractible might attend to too many things.

**Memory and Strategy Use.** Memory is a sequential process that has several components. Sousa (1999) provided an excellent description of this process. First, an individual must perceptually register information presented. This information is then immediately stored in short-term memory. Next, an individual uses his or her working memory to keep the information while it is processed. The information is then sent to long-term memory for storage. Later, through the process of retrieval, the information can be reused.

Research has indicated that many students with learning disabilities have problems with both visual and, particularly, auditory short-term memory (Swanson & Saez, 2003). These students also have difficulty in the area of working memory (Siegel, 2003; Swanson, Cooney, & McNamara, 2004). Attention, in fact, has been turned to this area because of the important role of working memory in reading recognition and reading comprehension (Seigneuric & Ehrlich, 2005; Siegel, 2003). For example, when reading a word, a student must simultaneously recognize the visual configuration of letters, note the order of the letters, and break the word into individual sounds. The student with a working memory deficit might have difficulty retaining this information while synthesizing and blending the letter sounds to recognize the word (Young, 2000).

There is evidence suggesting that the memory problems are related to the difficulty or failure to use strategies that facilitate remembering, and that the teaching of strategies can help an individual remember and learn new information. In one significant early study, Torgesen (1977) observed strategies used by both accomplished and poor readers to memorize different material. The accomplished readers recalled more information and consistently used more organized and active techniques to help them remember. More important, when the groups were given instruction on the use of efficient strategies, the poor readers’ memory scores improved to the point that there were no significant differences between the two groups. Put another way, students with learning disabilities are considered to be passive learners who do not use strategies as skillfully as their peers without learning disabilities and therefore need specific instruction in this area.

**Metacognition.** Metacognition is how one thinks about one’s own thinking and the ability to use and regulate strategies and other organization skills. Not only do students with learning disabilities have difficulty developing effective cognitive strategies, but they also may have problems with metacognition, knowing when and how the strategies should be employed. For example, a student might learn a specific strategy to remember information when reading a textbook and might not realize that that same strategy could be used in helping to remember other information as well.

**Social and Emotional Characteristics**

Research indicates that many students with learning disabilities have some type of problem in social and emotional areas. There are estimates that one-third of all students with learning disabilities have social skills deficits (Bryan, 1997) and that these students might also have problems relating to others (Haager & Vaughn, 1997). There is some evidence that students with learning disabilities are more likely to be socially rejected by their peers than their peers without learning disabilities (Kuhne & Wiener, 2000; Wong & Donahue, 2002). Similarly, many students with learning disabilities have fewer friends and less social status than their peers and thus should be provided with a supportive environment to enable them to meet others (Whitehouse, Chamberlain,
& O’Brien, 2001). Other behavior problems that have been associated with learning disabilities are depression, anxiety disorders, and antisocial personality disorder (Sundheim & Voeller, 2004). This should not be interpreted to mean that all, or even most, students with learning disabilities will display these characteristics, but you should be aware that they may exist.

Low self-concept, including academic, social, and general self-concept, has been reported for many students with learning disabilities (Elbaum & Vaughn, 2003). A related well-documented characteristic is learned helplessness. This refers to a situation in which individuals have inaccurate insight into the nature of their behavior, attributing their successes to external factors such as luck and attributing their failures to internal factors such as a lack of effort or ability.

As discussed in this section, there are many potential causes and a wide variety of characteristics of learning disabilities. What implications do these findings have for you? First, for the most part, the specific cause of learning disabilities will not be known, and probably has little relevance to what you would do instructionally. Second, the variability of characteristics suggests that you must be prepared to address any number of academic and nonacademic areas when planning and implementing instruction. In other words, instruction must be based on the specific characteristics of the student with a learning disability, not based on the general label of learning disability.

Check Your Understanding
1. What are some neurological and genetic causes of learning disabilities that have been suggested?
2. What prenatal, perinatal, and postnatal environmental factors have been associated with learning disabilities?
3. What types of characteristics of learning disabilities were reported by the 1963 task force?
4. What types of reading, mathematics, and written expression characteristics might a student with learning disabilities exhibit?
5. What types of problems might a student display in the area of cognition? Language? Social or emotional areas?

How Are Students with Learning Disabilities Identified?

The first step in the assessment process that leads to eligibility for learning disability services is the initial identification of the student as having a possible learning disability. This initial identification is often made by the general education teacher, but it could also be made by others, including the parents. Usually, informal procedures such as observation and classroom performance are used initially to identify a student. It is also possible that results from statewide or districtwide assessments might be used.

After a student is identified as having a possible learning disability, he or she is evaluated to determine whether eligibility criteria are met. Federal regulations related to learning disabilities include specific guidelines to help clarify the identification process. One of the guidelines in earlier regulations was that the student have a severe discrepancy between intelligence and achievement in one or more of the following areas: oral expression, listening comprehension, written expression, basic reading skills, reading comprehension, mathematics computation, or mathematics reasoning. In other words, a student would be identified as having a learning disability if his or her standardized test scores fell below what would be expected based on the student’s IQ score. Although there were those who strongly supported the concept of this aptitude-achievement discrepancy (e.g., Kavale, 2002), there were also critics who pointed...
to several problems with this model. One major argument against the discrepancy model was that it makes early identification of a learning disability difficult. In other words, using the discrepancy model means that students must “wait to fail” before they can receive services. Partially as a result of this and other arguments, IDEA 04 changed the guidelines associated with the identification of learning disabilities to eliminate the need for a severe discrepancy.

IDEA 04 also introduced the response to intervention (RTI) process, which determines whether or not a child responds to “scientific, research-based intervention” and indicated that this information could be used to help make a diagnosis of learning disability. Historically, there has been a heavy reliance on standardized testing. Depending on the specific eligibility criteria used and the nature of the student's problems, tests measuring intelligence and achievement, processing skills, and language and academic abilities are frequently used. Ideally, determination of eligibility is made using multiple sources of information. Recommendations have been made that both RTI and standardized tests be used in identifying learning disabilities and that the exclusive use of either is inappropriate (Wodrich, Spencer, & Daley, 2006).

**Response to Intervention**

**Response to intervention (RTI)** is a process to determine possible learning disabilities based on the student's response to scientific, research-based interventions. This procedure was designed as a multilevel approach to identify students who are experiencing academic problems before they fall too far behind. Several different models have been proposed; here are the steps in the RTI process as described by Fuchs, Mock, Morgan, and Young (2003, p. 159):

1. Students are provided with "generally effective" instruction by their classroom teacher.
2. Their progress is monitored.
3. Those who do not respond get something else, or something more, from their teacher or someone else.
4. Again, their progress is monitored.
5. Those who still do not respond either qualify for special education or for special education evaluation.

RTI is often thought of as a three-tiered model (Figure 4.4). The following example demonstrates the use of this model.

All first grade students at John F. Kennedy elementary school are administered the first grade reading list of 20 words from an informal reading inventory (Universal Screening). In Ms. Jenkins class of 30 students, six students, Teddy, Clarence, Ginny, Sue, Billy, and Joey, met the criterion indicated in the inventory for frustration level, thus indicating that they were struggling in the area of oral reading. These six students remained in the general education classroom and received direct instruction on phonics skills. Their performance was evaluated and monitored weekly using standardized word lists (Tier 1). Teddy, Clarence, Sue, and Joey failed to make appropriate gains and were given a more intense intervention program that included collaboration with a special education teacher. Monitoring of the oral reading continued (Tier 2). Teddy and Sue responded to the intervention but Clarence and Joey still were not making adequate progress. Clarence and Joey received an even more intensive program in which the reading specialist worked on a one-to-one basis with each student, and the monitoring continued. After several weeks, Clarence finally “caught on,” but Joey did not. Joey would now be considered for eligibility for a learning disability (Tier 3). Depending on the individual state's eligibility criteria, Joey's lack of response to intervention might be enough for identification, or, more likely, he may be recommended for an evaluation that will probably include standardized testing.

Two approaches to RTI are typically used—the problem-solving approach and the standard treatment protocol approach. In the problem-solving approach, a team of professionals decides the nature of the intervention that will be used with a specific
UNIVERSAL SCREENING: All students are given a screening measure. Students at risk for academic failure are identified.

<table>
<thead>
<tr>
<th>Tier 1</th>
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<tbody>
<tr>
<td>Students receive effective instruction in the general education setting, using validated practices. Student progress is monitored on a weekly basis. (In some approaches, universal screening is considered part of Tier 1.)</td>
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<table>
<thead>
<tr>
<th>Tier 2</th>
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<tr>
<td>Students whose progress is less than desired receive different or additional support from the classroom teacher or another educational professional. Student progress continues to be monitored.</td>
</tr>
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<table>
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<tr>
<th>Tier 3</th>
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<tr>
<td>Students whose progress is still insufficient in Tier 2 may receive even more intensive instruction, which can be provided in a variety of ways. Then, depending of a state’s or district’s policies, students may qualify for special education services based on the progress monitoring data or they may receive either an abbreviated or a comprehensive evaluation for the identification of learning disability.</td>
</tr>
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FIGURE 4.4 Three-tiered Response to Instruction (RTI) Model
Source: iris.peabody.vanderbilt.edu/rti01_overview/rti01_03.html

student so that no single intervention is used schoolwide. The standard treatment protocol, on the other hand, uses one universal, validated intervention for all students receiving extra help (IRIS Center, 2006). Although each approach has its strengths, the standard treatment protocol has been recommended because of the consistency of the intervention, particularly when RTI is used in place of standardized tests for identification (Fuchs & Fuchs, 2006).

The RTI approach has many advantages in identifying students with learning disabilities including the supplemental provision of instruction to a large number of at-risk students and ongoing progress monitoring. This approach also allows identification of a learning disability before the student begins to have significant problems (Vaughn et al., 2003). Other advantages are the potential reduction of bias during the identification process, and the emphasis on a risk model rather than a deficit model (Vaughn & Fuchs, 2003). The use of RTI could improve school-wide achievement because all students would be monitored to determine who needs additional help (VanDerHayden, Witt, & Barnett, 2005).

There are several unanswered questions about the RTI process. How long should the intervention be in place? How intense should the instruction be? What criteria will be used to determine responsiveness and unresponsiveness? What actually constitutes scientific, research-based instruction? How is RTI different from prereferral intervention? Compton (2006) raised additional questions that relate to who should receive the additional intervention and by whom the intervention should be applied. Vaughn and Fuchs (2003) questioned whether or not the lack of response to intervention in and of itself should be considered a learning disability. Several models have been suggested in which RTI is used in combination with low achievement (Fletcher, Francis, Morris, & Lyon, 2005) and with reading growth rates (Burns & Senesac, 2005). Should additional diagnostic information such as IQ be used to distinguish between a learning disability and an intellectual disability? Undoubtedly, these and other questions will be addressed as RTI is tested and refined.

The Use of Standardized Testing

Standardized testing historically has been the major approach used to determine whether a student meets eligibility criteria for learning disabilities. Because a number
of characteristics are associated with this category, it is not surprising that many different types of tests are used. Intelligence and achievement tests are the most routinely administered. Other instruments that are frequently used are tests measuring process skills, primarily if a deficit in that area is required for eligibility, as well as tests measuring language and academic skills.

Even though the presence of a severe discrepancy between intelligence and achievement is no longer required by the federal definition of learning disabilities, they remain important areas to evaluate. As the category of learning disabilities typically excludes those individuals whose measured IQ is below approximately 75, it is important to obtain a valid estimate of a student’s intelligence. In addition, many states and districts designate an IQ cutoff (e.g., above 80 or above 90). Achievement tests are administered to document that an educational need exists and to indicate the general level of performance in a wide variety of academic areas (an academic profile of strengths and weaknesses).

A somewhat controversial issue is the use of process tests, those designed to measure how well individuals integrate and understand information. According to the IDEA 04 definition of learning disabilities, a student with a learning disability has difficulty with psychological processing. One problem in assessing processing skills is determining what processing really means and what aspect of processing to measure. Perceptual processing tests were once quite popular and are still used in some states. These tests measure such skills as copying geometric figures. Other processing tests that are used include those in the areas of memory and, more recently, phonological processing.

Depending on the specific type of language or academic problem a student exhibits, a variety of instruments are available. For language problems there are tests that measure several components of language as well as specific language components such as semantics or pragmatics. Academic tests are available in reading, math, and spelling/written language. The choice of the instruments will depend on the individual characteristics of the student. In some instances, these types of instruments might be used to help make eligibility decisions. In others, they may be used to provide more information for instructional purposes.

Teachers play an important role in the overall identification of students with learning disabilities. As a general education teacher, you may be involved in the initial identification and will be involved if the RTI approach is used to help determine eligibility. As a special education teacher,
you might administer some of the standardized tests, primarily the achievement and academic tests, and also might be involved in the RTI approach.

**Check Your Understanding**

1. What steps are usually taken before a student is referred for a learning disability?
2. What is the response to instruction model? What are the pros and cons of this model?
3. Why are intelligence tests and achievement tests frequently used?
4. What are some problems with assessing processing skills?

**What and How Do I Teach Students with Learning Disabilities?**

There is considerable overlap in the instructional needs of students with mild/moderate disabilities across the categories of learning disabilities, mental retardation/intellectual disabilities, and behavioral and emotional disorders. These instructional needs may include academic instruction, functional and life skills instruction, and behavioral and social skills instruction. Generally, students with learning disabilities need highly intensive instruction in both the process of learning and the content of learning (Miller, 2002). The focus of instruction is determined by the individual student’s cognitive, social, and emotional needs, not by his or her category of exceptionality. Because the most prominent characteristic of students with learning disabilities is difficulty in academic learning, this chapter presents an overview of current educational programs and techniques for teaching academics to students with learning disabilities. Just as the instructional considerations in this chapter may apply to students with mild/moderate intellectual disabilities and/or emotional and behavioral problems, instructional considerations in Chapters 5 and 6 may also apply to some students with learning disabilities who may need a more functional curriculum and/or social skills focus in their educational programs. Keep this overlap in mind as you read all three chapters.

A vast array of techniques and materials is available for teaching academics, as well as other goal areas, to children, adolescents, and adults with learning disabilities. In selecting the appropriate program design, materials, and teaching techniques, teachers must fully assess each individual’s unique educational needs. A critical determinant of the type of program to implement is the age of the students (Lerner & Kline, 2006). Final consideration in program planning for an individual with learning disabilities of any age is to provide as much opportunity as possible for that student to interact with peers without disabilities. In this part of the chapter, we focus specifically on the content areas in which students with learning disabilities may need additional instruction, including transition skills, and specific instructional procedures that have proven successful with many students with learning disabilities.

**Instructional Content**

Most students with learning disabilities will be taught within the general education curriculum with additional support when needed in the areas of reading, written language, mathematics, and study skills. Another area that demands consideration in content planning for secondary students is transition. You may find that you need to implement a functional skills or social skills curriculum with some students with learning disabilities. These curricula are discussed in Chapters 5 and 6.

**Types of Content Knowledge**

Three different subprocesses of knowledge must be addressed when considering instructional content for students with learning disabilities: declarative knowledge,
procedural knowledge, and conditional knowledge (Meichenbaum & Biemiller, 1998). **Declarative knowledge** is knowledge of the facts that must be learned: in other words, the “what” part of learning. This will likely come from the general education curriculum goals. For example, declarative knowledge is knowing the three branches of the government or the names of the state capitals. This is the type of knowledge that is typically the focus of educational instruction and assessment. The two other types of knowledge, which are significant in teaching students with learning disabilities, are **procedural knowledge**, or the “how” of learning, and **conditional knowledge**, or the “when and why” of learning. For example, the student needs to learn that making a word or sentence out of the first letters of a list will help him or her remember the list (procedural knowledge) but will not be useful for learning the content of a full chapter (conditional knowledge). Declarative knowledge may be lacking in students with learning disabilities due to a deficit in procedural or conditional knowledge. For example, a student may be failing history tests because he or she may not know how and when to study the chapter. For students with learning disabilities to learn the same content as students without disabilities, an array of procedural and conditional strategies should become part of the content taught (e.g., Gersten, 1998). Procedural knowledge involves the use of cognitive strategies, and conditional knowledge involves the use of metacognitive strategies. Both of these will be covered under the section titled Instructional Procedures.

**Areas of Instructional Content**

The areas of content that are most often affected by learning disabilities are reading, written language, mathematics, and study skills. Which areas need to be addressed will be determined by the individual student’s needs.

**Reading.** Reading requires skills in the broad areas of both decoding and comprehension. Decoding is translating print into oral language, and comprehension is understanding the language of the text once it is decoded (Carnine, Silbert, & Kameenui, 1997). After a very comprehensive examination of reading research, the National Reading Panel (2000) identified five essential components of effective reading instruction: phonological awareness training, phonics instruction, fluency instruction, vocabulary instruction, and comprehension instruction. Students with learning disabilities may experience difficulty in any of these areas.

Phonological awareness is a skill that has come to the forefront of literacy education. Because spoken language is a continuous stream of sound, it is not until children begin to read that they must learn to segment language in the way that it is done in written language (Smiley & Goldstein, 1998). Students with problems in phonological awareness will need extra support in developing an understanding of how words, syllables, and sounds construct words. Fortunately, research shows that young children can develop phonological awareness through specific instruction and that such teaching can have a positive effect on overall reading achievement (Armbruster & Osborn, 2001; Torgesen, 2000). Typically, instruction in phonological awareness focuses first on spoken language and includes structured activities in rhyming, blending, and segmenting sounds and then moves to teaching alphabetic principles of how letters relate to the sounds in speech (phonics). A list of programs that have been developed for teaching phonological awareness and alphabetic principles is available at the Online Learning Center.

Some students with learning disabilities may need phonics instruction, or sound-symbol (letter) correspondences. The Direct Instruction (DI) method of teaching reading, designed in the late 1960s by Engelman and his associates, is one specific curriculum program with a very heavy phonics emphasis available to teach reading to students with learning disabilities. DI is a structured, teacher-directed program that should not be confused with the more general direct instruction, approach to teaching discussed in the Instructional Procedures section. DI is based on the principle of teaching sequences of skills designed to minimize error, providing ample practice, and giving immediate feedback and positive reinforcement. Its emphasis is on the declarative knowledge: The “what” of learning; knowledge of the facts, concepts, or definitions that must be learned.

procedural knowledge: The “how” of learning; cognitive strategy knowledge.

conditional knowledge: The “when and why” of learning; metacognitive strategy knowledge.
Some students with learning disabilities may need instruction in phonological awareness and phonics.

### Fluency

Fluency is the ability to read quickly and accurately and is, by its nature, related to reading comprehension, for if a reader takes too long to decode a sentence or passage, the beginning of what was read is lost before the end is reached. Students with problems with fluency will need extra help in learning to decode more quickly and accurately. Repeated readings, in which students are asked to read the same material repeatedly, is one strategy that has been found to be effective in building fluency (Kuhn & Stahl, 2003). In this approach, students are given one minute to read a passage. Then the number of words read accurately within that time frame is recorded; corrective feedback is often provided. Students are then asked to read the passage again to determine if they can accurately read more words within the minute. The passage is repeatedly read until students are reading 100 or more words accurately within a minute (DeVault & Joseph, 2004). Corrective feedback may include teacher modeling, direct instruction, and positive comments or suggestions (Conderman & Strobel, 2006).

Students with learning disabilities in the area of reading may display problems in vocabulary development. Repeated readings may also enhance vocabulary if corrective feedback includes information about new words and word meanings (National Reading Panel, 2000). Also promising in promoting vocabulary learning are interventions that engage students interactively with memory devices and graphic depictions (such as mnemonics and semantic mapping discussed later in the chapter) paired with antecedents of instruction, such as teacher directions, instructional statements, and prompts. Curriculum design is a critical element of the DI program (Stein, Carnine, & Dixon, 1998; Tarver, 1999). The DI approach teaches a series of carefully sequenced phonics skills. Children are taught in small groups, with teachers following a rigidly prescribed, fast-paced script that involves hand signals (one finger up for response time), auditory signals (such as clapping), verbal signals (such as “say it slow” and “say it fast”), and includes many opportunities for unison group responses. There is ongoing evaluation and continual regrouping according to demonstrated competencies or weaknesses. DI has been the focus of considerable validation and feasibility research and a high level of effectiveness has been reported (Carnine, Silbert, Kame’enui, & Tarver, 2004; Ellis, 2001; Tarver, 1999). Another exemplary program for students with language-based learning disabilities in the middle grades is the Wilson Reading System (Moats, 1998; Shaywitz, 2003). This structured program includes instruction in phonemic segmentation, sight word fluency, vocabulary, oral expressive language development, and comprehension.

** fluency The ability to read quickly and accurately.
with direct instruction and practice (Bryant, Goodwin, Bryant, & Higgins, 2003; Jitendra, Edwards, Sacks, & Jacobson, 2004).

Reading comprehension, creating meaning from words, is critical to independence and success in school and in much of life. Reading comprehension can be increased for students with learning disabilities through the development of cognitive and metacognitive strategies (Arntz & Osborn, 2001; Boulineau, Fore, Hagan-Burke, & Burke, 2004; Vaughn, Gersten, & Chard, 2000). Examples of strategies with demonstrated success in reading comprehension at various age levels, including story mapping, collaborative strategic reading (CSR), and peer-assisted learning strategies (PALS), can be found in Online Appendix A on the Online Learning Center. Repeated silent readings have also been used to improve comprehension rates of secondary students with learning disabilities (Freeland, Skinner, Jackson, McDaniel, & Smith, 2000).

Written Language. Students with learning disabilities may require support in developing written language skills. An effective way of supporting writing development is by focusing on writing as a process rather than a product. In the mid-1980s, Graves (1983, 1985) presented the idea that writing is not just a product but is a process of cognitive activity. This process involves question asking, decision making, problem solving, and feedback with the overall purpose to communicate ideas to others. The process of written composition occurs over time and includes several stages.

Teaching the writing process involves showing students how to write in overlapping and recurring stages, which include prewriting, drafting, revising, editing, and creating a final draft. In a recent analysis of research-based instructional interventions for teaching written expression to students with learning disabilities, three components of instruction stood out as reliably and consistently leading to improvement in teaching expressive writing: adhering to a basic framework of planning, writing, and revision; explicitly teaching critical steps in the writing process; and providing feedback guided by the information explicitly taught (Gersten, Baker, & Edwards, 1999). Teachers should remember that writing is a process that occurs over time and that it should be taught accordingly. Students with learning disabilities will typically need to be taught writing strategies within each component of the process. For example, in the stage of editing, students may need to learn to use the error monitoring strategy COPS (Schumaker, Deshler, Nolan, Clark, Alley, & Warner, 1981) to remind them to check for Capitalization, Overall Appearance, Punctuation, and Spelling. Both elementary and secondary students with learning disabilities have been found to write more reflective, complex, and well-written essays when explicitly taught writing strategies (Chalk, Hagan-Burke, & Burke, 2005; De La Paz, Owen, Harris, & Graham, 2000; Saddler & Graham, 2005; Schumaker, & Deshler, 2003). Online Appendix A includes descriptions of effective strategies.

Mathematics. Students with learning disabilities who lack awareness of skills, strategies, and resources that are needed to perform tasks and who fail to use self-regulatory mechanisms to complete tasks will undoubtedly have problems with mathematics (Miller & Mercer, 1997). As noted earlier, math disabilities are second only to reading disabilities as academic problem areas for students with learning disabilities. Fortunately, effective instruction in self-regulation and cognitive strategies use can improve both computation and conceptual problem-solving skills in students with math disabilities (e.g., Maccini & Hughes, 2000; Miller et al., 1998; Montague, 1997). Students with learning disabilities will often need learning strategies in both computation and story problem solving. For example, Big, Bigger, Borrow can prompt a student to borrow if the second numeral is bigger than the first. Online Appendix A includes some additional examples of successful math strategies.

Study Skills. Some study skills that students with learning disabilities may need to be taught include listening, note taking, time management, comprehension, textbook usage, memory strategies, and test taking. Many students with learning disabilities lack the organizational skills that are essential to learning. For example, their note taking...
may be so random or filled with inessential details that it does little to help them study. Or due dates and directions may be lost in a notebook that has no logical order of pages. Some students may become so discouraged that they stop trying and end up failing in school (Johns, Crowley, & Guetzloe, 2002). However, substantial gains in content learning have been reported with strategy instruction (e.g., De La Paz & MacArthur, 2003; Mastropieri, Scruggs, & Whedon, 1997; Pressley et al., 1995). For example, a passing grade in science may result when a student learns a strategy to help determine what points in a lecture and a chapter are essential. The acquisition of study skills may be the key to independence all through school and life for many individuals with learning disabilities. Learning a strategy such as using a planner book to keep track of due dates (or meeting dates and times) may eventually lead to better performance on a job. See Online Appendix A for additional study skill strategies.

**Transition Planning**

A key area of instructional content for secondary students with learning disabilities is in the area of transition. Although the majority of students with learning disabilities transition directly into employment (Gerber & Price, 2003), the IDEA mandate for education in the least restrictive environment has resulted in increasing numbers of students with learning disabilities being enrolled in academic coursework that should better prepare them for postsecondary education (Brinckerhoff, McGuire, & Shaw, 2002). In fact, more students with learning disabilities are enrolling in postsecondary education than in the past, and the full-time employment, employment benefits, and salary earned by graduates are both competitive with the general workforce and exceed those of adults with learning disabilities who are not college graduates (Madaus, 2006).

For students going into the workforce, goal setting and self-advocacy skills are important so that they will know what assistance or information they want or need, and can speak for themselves in the job setting. Specific vocational training programs may be necessary for success as well. Other areas that need to be addressed are independent living or life skills, vocational education, and community-based instruction. All of these are discussed in Chapter 5.

For students with learning disabilities going on to postsecondary settings, in addition to developing learning strategies in reading, writing, and study skills, transition plans should assist them with the development of goal setting and self-advocacy skills so that they can initiate services needed at the postsecondary level (Miller, 2002; Taymans & West, 2001). The secondary-level teacher of students with learning disabilities and the student should work closely with service providers at local postsecondary institutions to identify necessary services for students with disabilities. Some student experiences may include identifying the desirable characteristics of a college; understanding his or her legal rights; finding out what documentation is required to receive accommodations at his or her college of interest; enrolling in summer precollege courses or at least exploring to get to know the campus, the library, the study strategies, and time management skills that may need sharpening; learning and using strategies to investigate specific classes before enrolling (Taymans & West, 2001); and developing self-advocacy plans (Lock & Layton, 2001; Skinner, 1998). Students who have been identified as having a learning disability should come into the postsecondary setting fully aware of the strategies, accommodations, and devices that work for them and be able to advocate for their use. The use of assistive technology should also be included in transition programs as it is essential to success in postsecondary education (Mull & Sitlington, 2003) as well as in employment, social, and recreational/leisure activities. Technology exists in all of these settings today, including word processing, text messaging, and iPods or MP3s.

**Instructional Procedures**

Structure is an important part in planning instructional programs for students with learning disabilities. A structured program is one in which all students know the
daily routines and expectations; understand the rules; are presented the curriculum in an organized, sequential fashion; and are focused on learning tasks rather than extraneous stimuli. These concepts apply to programming for all age groups of students with learning disabilities. Developing a structured program takes a great deal of planning based on a sound foundation of knowledge of effective instructional strategies. Two teaching approaches that have been shown to be particularly effective with students with learning disabilities, which you may want to use with all of your students, are task analysis and direct instruction. Other approaches that may work well with students with learning disabilities emphasize an analysis of the unobservable cognitive behaviors that occur during a task. These cognitive approaches include cognitive and metacognitive strategies training and the use of mnemonics. Finally, this section concludes with some considerations for teaching students who are both English language learners and have a learning disability.

**Task Analysis**

One approach to organizing and sequencing curriculum used by teachers of all students that has been found to be especially effective for students with learning disabilities and that has been endorsed by many educators is the task analytic approach (Taylor, 2006). As you may recall from Chapter 2, task analysis involves breaking down a task, skill, or objective into simpler components. The task analysis begins when a teacher chooses a learning task appropriate for the child to master and states the terminal objective in behavioral terms that emphasize observable, measurable tasks. The terminal objective is then broken down into incremental steps arranged in order of complexity, with each step being a prerequisite for the next one, until the terminal goal is reached. It is important for teachers to state behavioral objectives clearly and concisely, being sure to specify what the student is expected to do as a result of instruction. The following might be a simple terminal objective for the elementary student:

Given problems requiring the subtraction of a one-digit number from a two-digit number with renaming, the student will write the correct answers.

A task analysis of this terminal objective would provide the following steps for teaching it:

- Given problems requiring the subtraction of numbers 1–10 from the numbers 1–10, the student will provide the correct answers.
- Given problems requiring the subtraction of 0 from the numbers 1–10, the student will provide the correct answers.
- Given problems requiring the subtraction of a one-digit number from a two-digit number without renaming, the student will provide the correct answers.
- Given problems requiring the subtraction of a one-digit number from a two-digit number with renaming, the student will provide the correct answers.

The task analysis method does not tell the teacher how to teach; it merely clarifies what the student should be taught. If the student has difficulty at any one step in the task, it is up to the teacher to provide additional procedures or develop smaller incremental steps for achieving the objective. While this strategy can be used with any student, it works particularly well with students with learning disabilities as it provides a logical and sequential structure for learning the skill and ensures that prerequisites are met.

**Direct Instruction**

A complementary effective instructional procedure to consider using with students with learning disabilities is direct instruction. Direct instruction is based on Rosenshine and Stevens's (1986) model of explicit, effective instruction, which has taken many forms but maintains several fundamental and sequential components of effective instruction. These include daily review, presentation, guided practice, independent practice, and weekly and monthly reviews.
independent practice, and weekly and monthly reviews. Although they do have
many basic principles of learning in common, direct instruction differs from Direct
Instruction (DI), introduced in the Instructional Content section, in that it is a gen-
eral teaching method, not a specific program. Research consistently demonstrates
that explicit, direct instruction enhances the achievement of students with learn-
ing disabilities (Swanson & Hoskyn, 1998) because it presents skills or information
in explicit steps to ensure that information is understood before the next step is
taken.

**Daily Review.** A well-planned direct instruction lesson begins with a review of the
previously presented material to check to be sure that students have retained the
material and to serve as an introduction and linkage to the new presentation. Ques-
tions are generally an appropriate format for review, particularly as this allows
more opportunity for student rehearsal.

**Presentation.** Second, the teacher presents new material. A good presentation con-
tains several components:

- *An advance organizer.* A short statement of the objectives and an overview of
  the lesson plan should begin the lesson.
- *A rationale.* Programming for generalization begins here with presenting to, and
  eliciting from, students some examples of why they need to know this and
  where they will use it other than in this class (i.e., other classes and real life,
  both work and social).
- *Presentation of the skill or strategy.* Lessons should be clearly presented, well-
  sequenced, and well-organized (Swanson, 1999). Characteristics include concise
  and clearly understood explanations, highlighted key concepts, sufficient illus-
  trations and concrete examples, and many questions to check for understand-
ing. A key aspect of this component should be actual demonstration and
  modeling of the skill or strategy by the teacher while “thinking aloud.”

**Guided Practice.** Third, in this teacher-guided, interactive step, students demon-
strate what the teacher has modeled, including the think aloud procedure, explain-
ning any problems they are having, making decisions, and evaluating their own
performance. Additional explanations and examples are given and, again, many
questions are asked by the teacher to check for understanding. Whenever feasible,
all students should have a chance to respond and participate as well as receive feed-
back, both positive and corrective. The teacher provides support, or scaffolds, until
the student is ready to assume control. If incorrect or incomplete responses are
given, prompts are provided, and students should be encouraged to evaluate their
own responses. Guided practice is usually continued until a success rate of 80% or its
equivalent is reached.

**Independent Practice.** Next, independent practice should be assigned that is
directly related to both the presentation and guided practice as determined by the
objective. The teacher should guide students through the first few examples, then, if
possible, actively supervise their independent practice. If students are truly ready for
independent work, the teacher will have to respond only to minor questions or give
cues as reminders. If the teacher finds that he or she is basically re-teaching the infor-
mation, this is an indication that not enough time was provided in presentation or
guided practice and that a return to the appropriate step is necessary. To be sufficient,
independent practice needs to continue beyond the level of mastery (overlearning).
Homework assignments should always be independent practice of skills that have
already been directly taught in the classroom.

**Weekly and Monthly Reviews.** Finally, there should be a systematic review of mate-
rrial to ensure that the learned material has been maintained. Generalization checks are
also needed to ensure students are using learned skills or strategies in other settings with other people. Prompting or re-teaching may be necessary. All of these components may be included in one lesson, or several lessons may be spent on one or more of the components. An example of a lesson plan using the direct instruction approach is shown in Online Appendix A.

**Cognitive and Metacognitive Strategies Instruction**
Research consistently has indicated that many individuals with learning disabilities do not know how to learn, need instructional strategies that can command attention, and frequently exhibit poor motivation. The cognitive model of instruction addresses these obstacles through an approach to instruction that adds an emphasis on learning *how to learn*. Instead of analyzing only the observable, measurable aspects of a task, the teacher should also consider the cognitive aspects of how a learner thinks when performing a task. For example, when a student is subtracting a three-digit number from a three-digit number, the teacher might instruct him or her to verbalize the steps required to perform the task while asking the questions, “What do I do next?” “Does that seem right?”

A sizeable research base exists that demonstrates the usefulness of the *strategies instruction approach*, directly teaching students how to use cognitive and metacognitive strategies to acquire skills and information (Sturomski, 1997). In an analysis of instructional components across a range of intervention studies, results support a combination of the components of direct instruction and strategy instruction as the best model for teaching academics to students with learning disabilities across diverse samples, classroom settings, and ages (Swanson, 1999). Effective strategy instruction usually includes cognitive strategies, metacognitive strategies, the Learning Strategies Curriculum, use of mnemonics, and attribution retraining.

**Cognitive Strategies.** *Cognitive strategies* are deliberate, planned activities used to acquire information, such as rehearsing a phone number or highlighting a chapter. This instructional procedure focuses on teaching students procedural knowledge, or how to learn and how to control their own learning. Examples of cognitive strategies include procedures in reading, such as self-questioning, constructing representational images, activating prior knowledge, and rereading difficult-to-understand sections of text; in writing, such as planning, drafting, reviewing, and revising; and in memorizing, such as repetition and relating to previously acquired, associated material (Pressley et al., 1995). One caution in teaching students with learning disabilities how to use cognitive strategies is to not let strategic behaviors become the end goal of instruction, but to teach them as tools to use to solve problems and acquire information. That is, simply learning the steps of a strategy for how to study is not the end goal; rather, using that strategy to increase grades in social studies should be the goal.

**Metacognitive Strategies.** Students with learning disabilities who have a deficit in metacognition are not aware of what variables affect their cognitive performance and thus do not plan and regulate their performance. *Metacognitive strategies* enable individuals to come up with a plan to direct, monitor, evaluate, and regulate their own behavior. For this reason, metacognitive strategies are often referred to as self-regulatory strategies (Sturomski, 1997). Good strategy instruction must include metacognitive strategy instruction, or conditional knowledge, to make students aware of the purposes of cognitive strategies, how they work, why they work, when they work, and where they can be used. For example, rehearsing information (saying it to oneself) will work for basic information like a phone number but will not work for a whole chapter.

Teaching metacognitive strategies involves three important areas of the learning process: planning, monitoring, and checking outcomes (Reid, 1988). During the *planning* phase, the teacher encourages the learner to decide which cognitive/learning strategy should be applied by predicting the outcomes of using different strategies to address the task requirements. The teacher should next teach the student to *monitor* his or her learning by self-questioning while using a strategy to see if it is working and,
if necessary, revising the original plan. Finally, the student should be taught to check the outcomes after learning and determine if the strategy has worked. An example of these processes for the task of studying a chapter follows:

Planning: The student plans to use highlighting, graphic organizers, or outlining to study, based on whether the exam will be essay or multiple-choice, and how much information is in the chapter.

Monitoring: While studying the chapter, the student asks, “Am I understanding this? Am I remembering this?” “Is this strategy working?” If not, he or she may have to reread or decide on another strategy for remembering.

Checking the Outcomes: The student may read and answer the questions at the end of the chapter just studied and decide whether to re-study, perhaps with a new plan, or congratulate him- or herself on a job well done.

For an example of cognitive and metacognitive processes applied to mathematical problem solving, see Figure 4.5.

**Learning Strategies Curriculum.** Instructional programs that include both metacognitive and cognitive aspects of the strategy being taught have achieved the most success with students with learning disabilities (Deshler, Ellis, & Lenz, 1996). The Learning Strategies Curriculum (LSC), developed by the University of Kansas Center for Research on Learning (see An Important Event), is an example of a very comprehensive curriculum for the secondary level that has an emphasis on both of these areas (Deshler, Warner, Schumaker, & Alley, 1983). The curriculum consists of a collection of learning strategy instructional packets that have been field tested extensively with positive results. The LSC is very structured and provides teachers with consistent, step-by-step procedures for teaching specific learning strategies to students with learning disabilities in both academic learning and social interaction. The strategies in academic learning are related to reading, storing and remembering information, expressing information, demonstrating competence, and mathematics. Strategies in social interaction include community building strategies, cooperative thinking strategies, a self-advocacy strategy, and a class participation strategy. The teaching model incorporates all components of effective instruction discussed earlier in the direct instruction approach to teaching. The University of Kansas Center for Research on Learning has also developed teacher-focused Content Enhancement Routines, which are techniques for teaching academically diverse students in general education content-area subjects by helping them identify, organize, comprehend, remember, and attend to important concepts presented in lessons or textbooks (Bulgren & Lenz, 1996). All of the routines

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**FIGURE 4.5** Cognitive-Metacognitive Model of Mathematical Problem Solving

promote direct explicit instruction. The manuals and materials for both the Learning Strategies Curriculum and the Content Enhancement Routines are available to the public only through training delivered by certified instructors.

**AN IMPORTANT EVENT**

**1978—Research Institute Established at University of Kansas to Focus on Adolescents with Learning Disabilities**

In 1978 the University of Kansas in Lawrence was funded by the Office of Special Education Programs to establish an Institute in Research in Learning Disabilities to focus on the study of interventions for adolescents with learning disabilities. The institute developed the Learning Strategies Curriculum to teach secondary students with learning disabilities how to use cognitive and metacognitive strategies to learn content. In 1993 the Center for Research on Learning was created within the institute as an umbrella research organization to encompass four research institutes and multiple lines of research. Since 1978, the work conducted by the center has had a significant effect on existing educational practices for adolescents and young adults who are considered to be at risk for school or job failure. The emphasis on cognitive and metacognitive strategy intervention for all ages of students with learning disabilities derived its impetus from the Kansas work.

**REFLECTION** Why do you think that funding was appropriated in 1978 to focus specifically on adolescents (and later adults) rather than on all students?

*Mnemonics.* Mnemonics is a cognitive strategy that may be useful to students with learning disabilities to help them remember information. Mnemonics are devices, such as rhymes or songs, used to aid memory. They are often used to help students remember the steps in a cognitive or metacognitive strategy or specific information. Individuals with learning disabilities, mild intellectual disorders, and behavior disorders across a wide age range can be taught to use mnemonic strategies independently and to generalize their use (Fulk, Mastropieri, & Scruggs, 1992; Greene, 1999; Levin, 1993; Mastropieri & Scruggs, 1991, 1998). Some of the most commonly used mnemonics include the “first letter” strategies of acronyms and acrostics. In an **acronym**, each letter represents the first letter in a word or sentence to be remembered. A well-known example of this is HOMES for the names of the Great Lakes (Huron, Ontario, Michigan, Erie, and Superior). A teacher-developed example is presented in the Classroom Example feature with each letter in LETTER representing the first letter in a series of steps for writing a friendly letter. This could also be used or adapted for a business letter. In an **acrostic**, a sentence is devised for letter retrieval. A familiar example is “Every good boy does fine” to remember the musical notes on the lines of the treble clef (E, G, B, D, F).

The cues provided by the first letter of each word of an acronym are minimal and may not be sufficient for some learners. When the to-be-recalled material is unfamiliar, keywords may be preferable (Brigham & Brigham, 2001; Uberti, Scruggs, & Mastropieri, 2003). The **keyword method** works to enhance recall by linking unfamiliar information to more familiar information. It is effective because it is concrete and meaningful and closely ties new information to students’ prior knowledge (Scruggs & Mastropieri, 2000). Mastropieri and Scruggs (1991) presented the following “three Rs” of the keyword method:

1. **Reconstruct** the term or word to be learned into an acoustically similar, already familiar, and easily pictured concrete term—select a keyword (to learn barrister is a lawyer, the keyword selected is bear).
2. *Relate* the keyword to the to-be-learned information in an interactive picture, image, or sentence (e.g., the interactive sentence to be pictured is “a bear pleading a case in court”).

3. *Retrieve* the appropriate response: when asked what the response is (what is a barrister?): first, think of the keyword (“bear”); second, think back to the interactive picture and what was happening in that picture (“a bear pleading a case”). Finally, give the desired response (“a barrister is a lawyer”).

**Attribution Retraining.** Students are more likely to use effective cognitive strategies when they attribute their learning success to the use of these strategies (Meltzer & Montague, 2001). Many students with learning disabilities may need to be taught to do this. Successful **attribution retraining** requires first teaching students to make statements that reflect attributions of effort, then teaching them to attribute difficulties to ineffective strategies, and finally, arranging for them to experience success with effective strategies (Ellis, Lenz, & Sabornie, 1987). Examples of positive self-statements that attribute success to effort and not to luck include: “I can probably do this problem because I’ve done similar ones successfully.” “I’m usually successful when I work carefully and use the learning strategy correctly.” “If I make a mistake, I can probably find it and correct it.” (Corral & Antia, 1997, p. 43).

The overriding goal of attribution retraining is to teach individuals that through effort and appropriate selection of strategies, they can be in control of their own learning and can be successful. Students must believe that making the effort to use strategies is worthwhile and will result in improved academic performance (Meltzer, Katzir-Cohen, Miller, & Roditi, 2001).

**Effective Instruction for English-Language Learners**

As more than one-third of students in public school may be from culturally and linguistically diverse backgrounds (Ford, 2000), you may very well have students in your class who are culturally and linguistically diverse. This presents an opportunity to use their cultural and linguistic diversity to their advantage.

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**Classroom Example**  Mnemonic Strategy for Teaching Students to Write a Friendly Letter

**Purpose:** To aid students in writing a friendly letter.

**Population:** Elementary

**LETTER**
- Lead off with date and greeting.
- Express my thoughts and ideas in the body.
- Terminate with closing and my name.
- Take time to proofread.
- Edit and revise if necessary.
- Realize that I am a good letter writer.

**Source:** Provided by Ellen Karger (1998), South Florida teacher of students with learning disabilities.
who are English language learners and also have learning disabilities. Many of the strategies you would consider for any of your students with learning disabilities will work as effectively with a student who is also an English language learner. Some of the instructional practices especially effective for English language learners, summarized in an examination of existing research and analyses of discussions with professional work groups by Gersten, Baker, Marks, and Smith (1999), include the following:

- Using visuals to reinforce concepts and vocabulary
- Utilizing cooperative learning and peer tutoring
- Making strategic use of the native language by allowing students to organize their thoughts in their native language
- Providing sufficient time and opportunities for students to use oral language and writing in both formal and informal contexts
- Focusing on rich and evocative vocabulary words during lessons and using these as vehicles for teaching literary concepts

Other practices to consider are providing lectures that are simplified, appealing, and multisensory; adapting textbooks and assignments; evaluating their textbooks and assignments for appropriateness; and using supplementary materials (Sheppard, 2001). Research on the characteristics of effective teachers of students with cultural and linguistic diversities indicates that effective teachers have high expectations of their students, see themselves as members of a community, believe in diversity and meeting individual needs, are confident in their ability to teach diverse students, recognize the diverse languages in their classrooms as valuable, and acquire a few words from each. They also communicate directions clearly, pace lessons appropriately, involve the students in decisions, monitor students’ progress, and provide feedback (Bos & Vaughn, 2006).

Check Your Understanding

1. What three types of knowledge need to be included in content teaching?
2. What are some major areas of content where students with learning disabilities may have special needs?
3. What should transition programs for students with learning disabilities in academic preparation programs include?
4. What is task analysis?
5. What are the fundamental and sequential components of effective instruction that are included in direct instruction?
6. What are cognitive and metacognitive strategies? What are some mnemonic devices that can be used successfully in teaching strategies? What is attribution retraining?
7. What are some strategies that are particularly effective with English-language learners who have learning disabilities?

What Are Other Instructional Considerations for Teaching Students with Learning Disabilities?

In addition to planning for instruction, the teacher of students with learning disabilities should give careful thought to the instructional environment and how instructional technology will be used. The instructional environment can play a significant role in the successful performance of students with learning disabilities. It is important to plan for both structure and organization in the environment and to give careful thought to how students are grouped. Instructional technology has many uses with students with learning disabilities from preschool through postsecondary settings. For some students, it is essential for success.
Instructional Environment

In general, organizing the instructional environment is a critical component of effective teaching and successful learning (Miller, 2002). It can play an important role by introducing order into the often chaotic lives of students with learning disabilities (Lerner & Kline, 2006). Major considerations in making decisions about the instructional environment involve two interrelated topics: determining the physical arrangement of the classroom and selecting the best option in grouping students for instructional purposes.

The Physical Arrangement

Despite the lack of uniformity in behavioral and educational characteristics among individuals with learning disabilities, certain environmental considerations have proven helpful with the vast majority of these students. In fact, most educators find that certain basic principles benefit all students whether or not they have learning problems. These principles include reducing congestion in high-traffic areas, making sure the teacher can see all students, making frequently used materials and supplies easily accessible, and ensuring that all students can see whole class presentations (Santrock, 2008). All of these contribute to helping students, with or without learning disabilities, stay on task and avoid distractions.

The Preschool Classroom. Over half of preschoolers with disabilities receive their education totally or primarily in general education classrooms (U.S. Department of Education, 2006). Overall, the preschool environment should be well designed and structured, and should be arranged to promote efficiency, accessibility, and independence. The materials and equipment should be arranged so that personnel and students can move quickly from one activity to another without undue delays. The arrangement of the classroom communicates the teacher’s expectations for participation and interaction in the classroom. The importance of developing language and pre-literacy skills, including positive experiences with oral and written language materials, should be evident in the arrangement of the classroom. This would include areas for language stimulation, phonological awareness centers, and centers where the students are read to, where students can handle books, and where students can make picture books. Also apparent should be centers and areas where students are introduced to alphabetic principles.

Elementary and Secondary Classrooms. Organization is a key component of achieving structure in classrooms for elementary and secondary students with learning disabilities (Muyskens & Ysseldyke, 1998). Any instructional equipment and materials should be organized and ready to use to avoid any “dead time” in which the student is left alone without instruction. Students should have definite places to put their class work and homework assignments, as well as their personal belongings and books. If a classroom is well organized, students with learning disabilities are more likely to behave appropriately and engage in instruction readily.

The classroom should have both tables and desks for individual work, large and small group work, peer tutoring, and cooperative learning, and areas that minimize distractions and promote student engagement (Olson & Platt, 2004). A work carrel is one option that provides a less-distracting environment for individual students with learning disabilities who seem to be overly distractible (Polloway, Patton, & Serna, 2005). The purpose of the carrel should be carefully explained, however, to make sure students do not view the isolation as punishment (i.e., timeout). Other ways to modify space are through the use of partitions, screens, special rooms, and quiet corners. The goal is to slowly increase the amount of space and number of distractions with which the student must contend (Lerner & Kline, 2006).

Instructional Grouping

Grouping is an instructional factor that can powerfully influence the levels of individual student engagement (Maheady, 1997). With increased numbers of students with
learning disabilities receiving education in the general education classroom, both special education and general education teachers need to consider grouping practices that are effective for meeting these students’ needs (Vaughn, Hughes, Moody, & Elbaum, 2001). In addition to individual student needs and abilities, the content being covered should influence the choice of grouping options as some instructional material is better suited to a particular grouping option. Frequently used groupings for students with learning disabilities include one-to-one instruction, small group, whole class, and peer tutoring.

One-to-One Instruction. In one-to-one instruction, students work alone with a teacher, a paraprofessional, or a computer with well-sequenced materials at their own level (Friend & Bursuck, 2006). Though one-to-one instruction has been a highly prized instructional procedure for students with learning disabilities, special educators report that the following factors impede their ability to implement one-to-one instruction: (1) heavy caseloads; (2) increased time to work collaboratively with classroom teachers, which reduces their time for providing instruction directly to students; and (3) ongoing and time-consuming paperwork that facilitates documentation of services but impedes implementation of services (Moody, Vaughn, & Schumm, 1997; Vaughn, Moody, & Schumm, 1998). Fortunately, although one-to-one instruction may be appropriate or even necessary in certain circumstances, such as catching up a student who has been absent from school, it is neither required for individualization of instruction nor has it been found to be superior to small group instruction (Polloway, Patton, & Serna, 2005; Thurlow, Ysseldyke, Wotruba, & Algozzine, 1993).

Small Group Instruction. Small group instruction may take place with homogeneous (similar skills) or heterogeneous (varied skills) groups of students, depending on the instructional objective. Individualizing instruction is more easily accomplished in small groups than in large ones; therefore, small groups are appropriate when teachers present different material to different students, and they are frequently used to teach the acquisition of a specific skill (Polloway et al., 2005) or to re-teach a skill to a small number of students who need more instruction. For example, small groups are appropriate when students are using different reading materials, need more
opportunities to respond to questions, or have fallen behind other students. Group formation should be flexible and should be determined by such criteria as students’ skills, prior knowledge, or interest levels (Vaughn, Hughes, Moody, & Elbaum, 2001). Use of flexible grouping strategies has been shown to improve achievement and self-esteem (Johnson & Johnson, 1991; Slavin, 1995) and to satisfy preferences of students with learning disabilities for working with a variety of classmates rather than with the same students all the time (Vaughn, Schumm, Klingner, & Saumell, 1995).

**Whole Class Instruction.** Although there are times when more individualized instruction in small groups is preferred for students with learning disabilities, there are other times when whole class instruction is effective (Elbaum, Schumm, & Vaughn, 1997). For example, large group instruction can be used effectively for brainstorming discussions, social studies or science content common to all, game playing, video watching, or numerous other classroom activities (Mercer & Mercer, 2005). Introduction and presentation of a strategy and guided practice may be provided for the whole class (Lewis & Doorlag, 2006). Large group instruction may be helpful to students with learning disabilities as they make the transition from special to general education settings where whole class instruction is the most commonly used practice (Bos & Vaughn, 2006).

**Peer Tutoring.** Peer tutoring has been shown to be effective for students with learning disabilities in elementary and secondary grades for both tutors and tutees (Elbaum, Vaughn, Hughes, & Moody, 1999; Topping & Ehly, 1998). Peer tutoring increases academic performance for students with learning disabilities in reading, spelling, math, learning social studies facts, and punctuation and capitalization in language arts. It has also been shown to improve social attitudes and attitudes about school learning, and to promote positive interactions among tutor, tutee, and content. However, for any peer tutoring experience to be effective, it must be carefully structured, with tutors trained, materials prepared, and an appropriate location designated. Friend and Bursuck (2006) suggest topics for training peer tutors, including the development of positive relationships with tutees and the development of effective communication and interaction skills. Students with learning disabilities should have the opportunity of being both tutor and tutee.

A version of peer tutoring that combines whole class instruction, peer tutoring, and cooperative learning, **classwide peer tutoring (CWPT)** (Greenwood, Maheady, & Delquadri, 2002), has been shown to be effective at both the elementary and secondary levels for students with learning disabilities (Olson & Platt, 2004). In CWPT, each student is paired with another student for tutoring in academics and can earn points, and bonus points, for following all the rules. This allows all students in the classroom to be actively engaged in learning and to practice in a motivating game format. This highly successful technique for grouping, which is great for inclusive classrooms, is discussed more in depth in Chapter 14.

**Instructional Technology**

Although technology has been used for some time with individuals with sensory or physical impairments, it is only in recent years that technology has been used with students with learning disabilities (Bryant & Bryant, 1998). Technology for teaching academics to students with learning disabilities generally falls under the umbrella term **assistive technology.** As mentioned in Chapter 1, an assistive technology device is defined by IDEA 04 as any item, piece of equipment, or system that is used to maintain or improve functional capabilities of individuals with disabilities. Appropriate assistive technology for students with learning disabilities can include, but is not limited to, computers, video cameras, laser videodiscs, taped books, software programs, spellers, tape recorders, readers, scanners, calculators, electronic mail, and electronic date books. These devices, or equipment, may be high tech, using sophisticated electronics, or low tech, such as an abacus.
for math computation (Learning Disabilities Association [LDA], 1995). For many students with learning disabilities, assistive technology adaptations are imperative for success (Bryant & Bryant, 2003). For example, word processors and software for creating graphic organizers can make it possible for students with learning disabilities who have trouble composing and writing on paper at the same time to create reports and essays that are equivalent to or better than those of their peers without disabilities. Speech recognition programs can help students write better because they can first get their thoughts down on paper—something they were unable to do successfully before—by first dictating what they want to write. Computer-assisted instruction can provide the extra practice students with learning disabilities may need to master basic math facts. Use of necessary assistive technology should be written into an individual student’s IEP. It is then the responsibility of the school district to provide assistive technology devices and services identified in the IEP (LDA, 1995).

Finally, when considering the use of technology, the student’s family background should be kept in mind. Family decisions involved in the use of technology are often influenced by cultural and linguistic backgrounds (Parette, 1998; Parette & McMahan, 2002). For the best results in assistive technology implementation, teachers must be sensitive to these issues. Different cultures view the use of technology differently. For example, Euro-American families may want to be taught how to teach their children to use the devices whereas Asian American families may prefer that professionals assume responsibility for training (Parette, 1997, cited in Parette, 1998).

Use of Instructional Technology with Preschool Students with Learning Disabilities

Many assistive technology devices considered standard in classes for older students with learning disabilities can also be used with preschoolers if the children are carefully supervised. These include tape recorders, language masters, overhead projectors, and computers. Children even younger than 3 years of age can learn to operate a computer safely and effectively. Interactive software based on good children’s literature and appropriate content is increasingly available (Hutinger & Johanson, 1998) and helps the child to maintain attention longer and screen out outside distractions. Practice with computer programs designed to build skills in phonological awareness has been shown to positively affect the skills of preschool and kindergarten children (Foster, Erickson, Foster, Brinkman, & Torgesen, 1994).
In Practice Meet Educator Michael Woods and His Student Kathy

I teach learning strategies at an urban high school in one of the nation’s largest school districts. I have taught for over 14 years, primarily at the high school level, though I have worked with students at all levels. My area of expertise is postsecondary transition and independent living skills. I was honored to receive the 2004 Teacher of the Year Award in my school district.

My student Kathy is an 11th grader who has been receiving services for learning disabilities since the 4th grade. She was in a pullout resource room setting through middle school. She was gradually included more and more in general education and now, with the exception of her learning strategies class, attends all classes in an inclusive general education setting. She is working on a standard diploma, and her IEP goals are directed at teaching her learning strategies to support her success in the inclusive environment.

Kathy has experienced success in her elective courses (art, physical education, cooking). However, she requires extensive support in her academic courses. These supports include teaching her cognitive and metacognitive learning strategies in reading comprehension, study skills, essay and short answer test taking skills, and report writing. Additionally, Kathy needs to develop self-advocacy skills. She shows some limitations when it comes to communicating her needs and/or questions to her general education teachers. She describes talking to her teachers as “difficult.” When asked why, she replies, “I don’t want to feel stupid … there are only a few teachers I am good at talking with.”

I had to help her feel more positive about her ability to meet these requirements. I pointed out that she could be successful if she tried hard and applied the strategies she learned in her strategies class.

Instructional Content and Procedures

Like many students with learning disabilities, Kathy and the students in my learning strategies course require ongoing instruction in organizational strategies, study skills, self-advocacy, and written expression. For that reason, whole group lessons have been created to provide both support and reinforcement of these activities. I have taught Kathy to use graphic organizers to better understand her reading assignments. She has learned to attend to the text organization patterns (for example, chronological, compare-contrast, or cause-effect) and to select a graphic organizer that she can apply to that particular chapter or text. She has also learned to attend to the visual cues in each of her texts, including bold print and marginal notes. As another example, I focus on note taking and

Use of Instructional Technology with Elementary and Secondary Students with Learning Disabilities

A creative teacher uses assistive technology in a variety of ways to enhance the educational programming for elementary and secondary students with learning disabilities. When used appropriately, assistive technology can make initial teaching presentations, as well as subsequent drill, exciting to students with learning disabilities who are often turned off by traditional class work. For example, Number Heroes (Edmark, Inc.) presents basic math concepts and problem-solving skills with the help of Fraction Man, Star Brilliant, and other math superheroes (Bryant & Bryant, 2003). Assistive technology should be chosen with the students’ needs in mind. Students who are highly distractible may attend to a learning task more easily when they put on earphones and listen to a tape recorder or, better yet, listen to and interact with a language master. The overhead projector can also make a lesson more enjoyable for students with learning disabilities and allows
study skill habits. While most special education classes teach these skills throughout the lower and middle grades, this skill becomes critical in the high school setting. To help with this, we required Kathy to continue taking notes, so she can develop this skill, in addition to asking the instructor for a copy of his or her notes so she is sure to have all of the information.

Much of the content in my learning strategies class is tailored to events that are happening within the general education classroom. For example, if a science teacher requires students to complete a report on the “Planets,” instruction within my classroom focuses on how to glean information from various resources on planets as well as how to create an organized, comprehensive report. Although students learn many of these skills in other academic courses, such as English, the generalization to other settings can be quite difficult for students with learning disabilities.

Instructional Environment and Technology

My learning strategies class that Kathy attends is conducted every other day for 100 minutes, on a block schedule. I also support Kathy and my other students in the general education classroom through observations and student–teacher reports. The learning strategies class is a mixed-grade-level class; students in grades 9 through 12 attend. This setting lends itself well to peer support and tutoring, especially for students who have successfully completed courses in which other students require assistance. However, this mixed setting sometimes makes it difficult to meet the instructional needs of all students. The utilization of whole group lessons—I provide direct instruction of specific learning strategies from the University of Kansas curriculum—can be of great assistance when trying to ensure instructional momentum within the class. However, I still do a tremendous amount of more intensive individualized instruction with each student applying the strategies to his or her own specific texts.

The utilization of technology can be of great assistance for my students, particularly when they are writing research reports. Many young high school students are very computer savvy. What they often lack, however, is the ability to discern which information is important and which is extraneous. In my learning strategies course, I teach students to transfer skills they use for text-based readings to the online setting. For example, the same use of graphic organizers to comprehend text chapters can be applied to reading material online and taking notes on it for writing a research paper.

Collaboration

I find it very necessary to stay in close communication with Kathy’s general education teachers. I try to meet face to face with each teacher at least once a week, but if time constraints do not allow this, I communicate with them through written reports or questions in their school mailboxes or e-mail. I have encouraged their use of peer tutoring and cooperative learning techniques within their general education courses. I have pointed out how techniques such as these benefit both general education and special education students and help engage all students in learning. I also share articles from some of my journals that relate to what they are teaching. Collaborating requires some finesse, as building communicative, productive relationships with teaching peers can be challenging. In Kathy’s situation, she initially wanted me to intervene with her teachers to assist in her success. It was important for me to cooperate with her teachers rather than to appear threatening or judgmental. Later in the year—and after some coaching and instruction—Kathy was able to intervene (using her newly developed self-advocacy skills) on her own behalf. By intervening on her own behalf, Kathy was able to eventually learn to address her own questions in a more expedient manner.
Computer software is available in a number of areas in which students with learning disabilities often need extra support. Several computer programs have been developed to support phonological awareness skills and letter-sound correspondence practice for elementary-level students (Torgesen, 1999). The scope of reading skills covered by reading software programs may include word identification, vocabulary, fluency building, and comprehension (Bryant & Bryant, 2003). In the area of writing, technological tools can make the process easier as well as more motivating for students with learning disabilities (Graham, Harris, & Larsen, 2001). For example, SOLO, a widely used software toolset from Don Johnston, Inc. that includes Write Outloud, Co-writer, and Draft Builder, develops learning skills in reading, writing, planning, organizing, revising, and editing for students in grades 3 to 12. Another widely used program is Inspiration, which students can use to create graphic organizers and expand topics into writing. In Kidspiration, K–5 students can build graphic organizers by combining pictures, text, and spoken words to represent thoughts and information. In mathematics instruction, computer-aided instruction has been shown to be an effective tool (Okolo, Bahr, & Reith, 1993). Students who use appropriate technology persist longer, enjoy learning more, and make gains in math performance. Instructional software for computation, time, money, measurement, algebra, and word-problem solving is widely available. Students with poor organizational skills, memory deficits, or illegible handwriting may benefit from using personal digital assistants (PDAs) to keep track of assignments, make to-do lists, take notes, cue themselves to perform a particular task with the alarm or paging system, access and remember task sequences, or organize important information (Bauer & Ulrich, 2002; Matthews, Pracek, & Olson, 2000; Miller, 2000; Salend, 2005). A significant advantage of handheld PDAs is their portability and their universal use.

**The Selection of Technology**

Technology has great potential for improving performance of students with learning disabilities on general education expectations (Maccini, Gagnon, & Hughes, 2002),

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**Classroom Suggestions**

Tips for Software Selection

<table>
<thead>
<tr>
<th>When selecting software, make sure:</th>
<th>✔ There are small increments between levels.</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔ Content is free of gender, cultural, and racial stereotypes.</td>
<td>✔ Only a limited number of incorrect responses are allowed per problem.</td>
</tr>
<tr>
<td>✔ Content is interesting, engaging, and encourages exploration and imagination.</td>
<td>✔ There are built-in instructional aids (e.g., virtual manipulatives in math).</td>
</tr>
<tr>
<td>✔ Activities require decision making and judgments.</td>
<td>✔ There are minimal keyboard skill requirements and easy-to-understand icons.</td>
</tr>
<tr>
<td>✔ It has a high degree of interactivity.</td>
<td>✔ There are praise and helpful feedback provisions.</td>
</tr>
<tr>
<td>✔ The screen is not cluttered. The less clutter on the screen, the better.</td>
<td>✔ It has a built-in review.</td>
</tr>
<tr>
<td>✔ Procedures and goals match those being taught in school.</td>
<td>✔ Real-life solutions are simulated.</td>
</tr>
<tr>
<td>✔ Directions are simple to read or have images or speech to guide use.</td>
<td>✔ It has good record-keeping capabilities.</td>
</tr>
<tr>
<td>✔ Software is modifiable (e.g., speed, quantity of problems, levels).</td>
<td>And</td>
</tr>
<tr>
<td>✔ Programs contain more than one activity.</td>
<td>✔ Remember software is a learning tool—not the total solution!</td>
</tr>
</tbody>
</table>

Source: Adapted from Lee (1987), Babbitt (1999), Hutinger and Johanson (1998).
but teachers must take care to choose well-designed, time-efficient programs. They must also avoid using the computers to simply keep students occupied without relating the computer work to their educational needs. Assistive technology must be carefully matched to the needs of the student and the environment in which the learning will take place (Beigel, 2000).

With valuable instructional time limited, teachers should carefully select appropriate, time-efficient software that meets the needs of students and incorporates best practice in instructional design and curriculum (Bryant & Bryant, 2003). Several characteristics of software that result in efficient use by students with learning disabilities are presented in the Classroom Suggestions feature.

The need for assistive technology does not end with education, but persists in employment, social, and recreational/leisure activities (Raskind & Bryant, 2002). Whether it is writing a letter to a friend at home with the assistance of a word processor, checking for spelling errors in a memo to a coworker, or using a calculator to help keep score in a card game, assistive technology devices may provide the needed support to enable individuals with learning disabilities to be effective in a variety of contexts and settings.

Check Your Understanding

1. What are two key elements in physical arrangement of the instructional environment for students with learning disabilities?

2. Describe some instructional grouping options for students with learning disabilities.

3. What is assistive technology? What assistive technology is appropriate for preschool children with learning disabilities? How can assistive technology be used with elementary and secondary students with learning disabilities? What are some characteristics of well-designed, time-efficient software programs?

What Are Some Considerations for the General Education Teacher?

Instruction for students with learning disabilities typically takes place in a general education classroom, with or without direct special education support, although some pullout classes may be necessary. In fact, almost all students with learning disabilities spend at least a portion of their day in general education settings (U.S. Department of Education, 2006). The role of the special education teacher is most often that of a collaborator or team teacher working with the general education teacher. The educational goals for students with learning disabilities will usually be derived from the general education curriculum. The high frequency of this occurrence is likely affected by the IDEA 04 requirement that students with disabilities be included in statewide assessment programs. Some ways to provide access to the general education curriculum for students with learning disabilities include the use of accommodations, adaptations, parallel outcomes, and overlapping curriculum.

An accommodation is a change based on the student’s needs in how information is presented by the teacher or how understanding is demonstrated by the student (King-Sears, 2001). Accommodations may be provided in instructional methods and materials, such as think aloud models and graphic organizers; assignments and tests, such as varying formats and step-by-step instructions; time demands and scheduling, such as extended time for tests and early assignments; and the learning environment, such as in the use of a closed study carrel to complete work (Beech, 2003). For example, a student with a learning disability may need extended time to answer essay questions given in a history class, or the student may be

JUSTIN REVISITED

Justin’s general education teacher is concerned about his progress. Do you think Justin should remain in a general education classroom? Why or why not?
Classroom Suggestions  Accommodations That Can Be Made in the General Education Classroom for Students with Learning Disabilities

<table>
<thead>
<tr>
<th>DIFFICULTY</th>
<th>EXAMPLES OF ACCOMMODATIONS</th>
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<tbody>
<tr>
<td>Understanding lectures, discussions</td>
<td>❑ Introduce new vocabulary before the lesson.</td>
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<td></td>
<td>❑ Provide overview of content at beginning.</td>
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<td></td>
<td>❑ Use advance organizers on what will be included.</td>
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<tr>
<td>Following directions</td>
<td>❑ Use prearranged signal to gain attention.</td>
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<td></td>
<td>❑ Change tone of voice to alert student.</td>
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<td></td>
<td>❑ Give student agenda or schedule for each day.</td>
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<td></td>
<td>❑ Repeat and simplify directions.</td>
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<td></td>
<td>❑ Combine oral directions with pictures or diagrams.</td>
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<td></td>
<td>❑ Assign a study buddy.</td>
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<tr>
<td>Completing assignments</td>
<td>❑ Break long-term assignments into parts with earlier due dates.</td>
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<td></td>
<td>❑ Use a kitchen timer.</td>
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<td></td>
<td>❑ Give student individual responsibility checklist.</td>
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<tr>
<td>Confused by complex materials</td>
<td>❑ Block sections on paper for each response by drawing lines or folding.</td>
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<td></td>
<td>❑ Use color coding.</td>
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<td></td>
<td>❑ Use uncluttered, clearly formatted tests and worksheets.</td>
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<tr>
<td>Organizing or locating materials</td>
<td>❑ Let student use special folder or binder.</td>
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<tr>
<td></td>
<td>❑ Give student compartmentalized container.</td>
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<td></td>
<td>❑ Give student a checklist for each class to be kept in binder.</td>
</tr>
<tr>
<td></td>
<td>❑ Let student keep one copy of school materials at home and another at school.</td>
</tr>
<tr>
<td>Handwriting</td>
<td>❑ Place a dot on starting place.</td>
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<tr>
<td></td>
<td>❑ Let student use a word processor.</td>
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<tr>
<td></td>
<td>❑ Let student dictate to a teaching assistant or classmate.</td>
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<tr>
<td></td>
<td>❑ Let student use audio or video recording.</td>
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<tr>
<td></td>
<td>❑ Reduce length of assignment or allow more time.</td>
</tr>
</tbody>
</table>

Source: Adapted from Beech (2003).

allowed to present the information in the form of a graphic organizer rather than an essay. Many accommodations also help students without disabilities, but they are necessary for some students with learning disabilities to benefit from the general education curriculum (Bigge & Stump, 1999). See the Classroom Suggestions for other examples of accommodations.

Beyond accommodations, some types of curriculum changes may be considered in teaching students with learning disabilities in general education classrooms (King-Sears, 1997, 2001; Switlick, 1997). First, an adaptation is a change made to the curriculum that keeps the academic content the same as for other students but slightly changes the conceptual level required. For example, if most students are required to define 20 terms, a particular student with a learning disability may need only match the definitions and terms, while another student with a different learning disability may be required to learn fewer terms. Second, a parallel curriculum is a curriculum change in which all students study the same content, but what is to be learned within that curriculum differs for a student with a learning disability. For example, whereas most students in the math class are working on basic addition facts, the student with a learning disability may be working on one-to-one correspondence. Finally, an overlapping curriculum plans for a student to participate in both a shared curriculum and a supplementary curriculum based on his or her specific needs, allowing a student with a learning disability to be involved in the general education curriculum while also working on very different content or curriculum goals (King-Sears, 2001). For example, a student may work on the same general science goals as the rest of the class while also being assigned the overlapping goals of ask-
ing for help and accepting criticism in a social skills curriculum. In summary, as most students with learning disabilities spend at least part of their day in general education classrooms, the general educator must be prepared to work with these students, both on his or her own and in collaboration with the special education teacher.

**Check Your Understanding**

1. What is an accommodation?
2. What are some ways in which the general education curriculum may be modified to meet the needs of students with learning disabilities?
3. What is a parallel curriculum? What is an overlapping curriculum?
### What IDEA 04 Says about Learning Disabilities:

Learning Disabilities is an IDEA 04 category. IDEA defines learning disabilities as “a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest in an imperfect ability to listen, think, speak, read, spell, or do mathematical calculations.” Disorders included are perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Disorders not included are learning problems that are primarily the result of visual, hearing, or motor disabilities; mental retardation; emotional disturbance; or environmental, cultural, or economic disadvantage.

### Identification Tools:
The general classroom teacher often makes the initial identification based on classroom observation and performance, and state- or districtwide assessments.

**Prereferral Assessment:** Possibly uses criterion-referenced testing, curriculum-based assessment, and criterion-referenced measurement.

**Formal Identification:** Several sources are used for identification. They may include intelligence and achievement tests, tests measuring process skills, and language and academic tests. The response to intervention approach may also be used.

### Practical Considerations for the Classroom

#### Characteristics | Indicators You Might See
--- | ---
**Related to Reading** | May have problems with phonological awareness or processing; rapid automatic naming; word recognition (mispronunciation; skipping, adding, or substituting words; reversing letters or words; difficulty blending sounds together); and comprehension (due to lack of background knowledge, difficulty understanding text structure, and vocabulary deficits).

**Related to Mathematics** | Possible problems with basic number facts, calculation, application, language of math, problem solving, oral drills and worksheets, word problems, math anxiety, and retrieving information from long-term memory.

**Writing and Written Expression Characteristics** | Possible problems with handwriting, spelling, or written language/written expression (punctuation, vocabulary, and sentence structure).

**Expressive and Receptive Language Characteristics** | Possible problems with phonology, morphology, syntax, semantics, or pragmatics.

**Cognitive Related Characteristics** | Possible problems with attention, memory, strategy use, and metacognition.

**Social and Emotional Characteristics** | Possible social skills deficits, and problems with social cognition and relationships with others. May have fewer friends and less social status than peers. Possible behavioral problems include depression, anxiety disorders, and antisocial personality disorder. May also display learned helplessness.
### Students with Learning Disabilities

#### Teaching Implications

**Instructional Content**
- Most students with learning disabilities will participate in the general education curriculum. They will most likely need intensive instruction in the process of learning and in the content of learning.
- Consider need for the curriculum to include declarative knowledge, procedural knowledge, and conditional knowledge.
- Consider the Direct Instruction program for reading.
- Support content areas of reading (phonological awareness, decoding and comprehension), written language (teaching writing as a process), mathematics (computation and problem solving), and study skills (such as listening, note taking, time management, comprehending textbook usage and memory strategies).
- Transition planning should include the development of goal setting and self-advocacy.

**Instructional Procedures**
- Provide a structured instructional program with daily routines and expectations; clear rules; curriculum presented in an organized, sequential fashion; and a focus on learning tasks rather than extraneous stimuli.
- In planning, consider what, how, and when to teach; provide activities for practice, feedback, and evaluation; organize and pace the curriculum; and provide smooth transitions.
- Consider using task analysis and direct instruction.
- Consider using cognitive and metacognitive strategies instruction.
- Effective instructional practices for ELLs include using visuals to reinforce concepts and vocabulary, utilizing cooperative learning and peer tutoring, making strategic use of the native language by allowing students to organize their thoughts in their native language, providing sufficient time and opportunity for students to use oral language and writing in formal and informal contexts, and focusing on rich vocabulary words during lessons to be used as vehicles for teaching literary concepts. Also consider providing simplified, appealing, multisensory lectures; adapting textbooks and assignments; and using supplementary materials.

**Instructional Environment**
- Reduce congestion in high-traffic areas, make sure you can see all students, make frequently used materials and supplies easily accessible, ensure that all students can see whole class presentations.
- For preschool students, the environment should be structured and promote efficiency, accessibility, independence, and functionality. It should also promote language and literacy development.
- For elementary and secondary students, the environment should be organized to prevent “dead time.” Structure and routine are important. Space should be available for individual work, large and small group work, peer tutoring, and cooperative learning. Decrease possible distractions.
- Effective grouping options include one-to-one instruction, small group, whole class, peer tutoring, and classwide peer tutoring.

**Instructional Technology**
- For preschool students, consider interactive software as well as other technology typically used with older students.
- For elementary and secondary students, consider how the computer can be used for drill and practice, tutoring, instructional games, research, writing, and problem solving. Technology is available to help develop reading, writing, math, and organizational skills.
- Keep family’s background and culture in mind when recommending technology.

<table>
<thead>
<tr>
<th>Methodologies and Strategies to Try</th>
<th>Considerations for the General Classroom and Collaboration</th>
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<tbody>
<tr>
<td>• Task Analysis (p. 119)</td>
<td>Instruction generally occurs in the general education classroom.</td>
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<tr>
<td>• Direction Instruction (p. 119)</td>
<td>The general education teacher should:</td>
</tr>
<tr>
<td>• Cognitive Strategies (p. 122)</td>
<td>• Establish a positive climate that promotes valuing and accepting personal responsibility for learning.</td>
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<tr>
<td>• Metacognitive Strategies (p. 122)</td>
<td>• Consider accommodations such as modified instructional methods or materials, assignments and tests, time demands and scheduling, and the learning environment.</td>
</tr>
<tr>
<td>• Mnemonics (p. 124)</td>
<td>• Consider adapting the academic content.</td>
</tr>
<tr>
<td>• Attribution Retraining (p. 125)</td>
<td>• Consider a parallel or overlapping curriculum.</td>
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</tbody>
</table>

**Collaboration**
General and special educators should consult on:
- Determining the curriculum
- Developing accommodations
- Choosing procedures and strategies
- Planning the physical environment
- Planning for assistive technology
Chapter Summary

Go to the text’s Online Learning Center at www.mhhe.com/taylor1e to access study resources, e-sources, practice quizzes, and extending materials.

What Are the Foundations of Learning Disabilities?

• The history of learning disabilities can be viewed in four distinct periods: the foundational phase, the transition phase, the integration phase, and the current phase. In the current phase, the focus is on the academic, behavioral, cognitive, and language aspects of learning disabilities.
• The IDEA 04 definition of learning disabilities, which includes both inclusion and exclusion criteria, is most frequently used although the NJCLD definition has received support.
• About 4% to 5% of school-aged children are identified as having a learning disability, representing almost half of all students identified as having a disability under IDEA 04. Prevalence seems to be affected by gender, ethnic background, and geographic region.

What Are the Causes and Characteristics of Learning Disabilities?

• Possible causes of learning disabilities are grouped into neurological; genetic; and environmental, including prenatal, perinatal, and postnatal factors.
• Learning disabilities represent a wide range of characteristics, and no one individual will display all of them.
• Frequently reported characteristics related to learning disabilities include problems in the areas of reading, mathematics, written expression, expressive and receptive language, cognition, and social and emotional skills.

How Are Students with Learning Disabilities Identified?

• IDEA 04 now allows the use of response to intervention to help in the identification process.
• Identification of a learning disability typically involves the measurement of intelligence and achievement and, in some states, testing psychological processing.

What and How Do I Teach Students with Learning Disabilities?

• Most students with learning disabilities participate in the general education curriculum. In planning for content, teachers should consider types of content knowledge and whether extra instruction is needed in the areas of reading, written language, mathematics, or study skills.
• Students with learning disabilities may go on to postsecondary settings or move directly into the workforce. Transition services to prepare for either of these routes needs to be a part of the curriculum.
• Instructional procedures found to be particularly effective for students with learning disabilities include task analysis, direct instruction, and cognitive and metacognitive strategies instruction. English language learners with learning disabilities may require additional accommodations to fully benefit from instructional procedures.

What Are Other Instructional Considerations for Students with Learning Disabilities?

• Structure and organization are key aspects of the environment for students with learning disabilities and need to be considered in planning the physical arrangement of the classroom.
• Grouping options that should be considered when teaching students with learning disabilities include one-to-one instruction, small groups, whole class, and peer tutoring. Which option is used will depend on the individual student and what is being taught.
• The use of technology to assist students with learning disabilities can be valuable from preschool through the secondary level. Technology is often used with students with learning disabilities to make the presentation of information more interesting and clear, to provide additional practice with concepts, and to provide supports needed to complete tasks.

What Are Some Considerations for the General Education Teacher?

• The general education teacher may adjust assignments or lessons through accommodations and adaptations to the curriculum.
• Parallel curriculum outcomes or an overlapping curriculum may be used to aid inclusion of students with learning disabilities in the general education classroom.

Reflection Questions

1. Do you think that a severe discrepancy between ability and achievement should still be used as a criterion for the identification of learning disabilities? Why or why not?
2. As noted in this chapter, the specific cause of a learning disability is frequently unknown. Given this fact, do you think students from low-socioeconomic environments should be excluded from the learning disability category even though that might be associated with their academic problems? Why or why not?
3. Does the response to intervention model make sense for identifying students with learning disabilities? Why or why not? Should it be used by itself to identify these students, or should other assessment information also be included? Why?
4. Should students with learning disabilities be included in general education classes and be required to meet state standards and participate in state assessment programs? What are the pros and cons of doing so?
5. Some teachers are reluctant to provide accommodations in their classes for students with learning disabilities because they feel it is unfair to the other students. How would you justify the need for accommodations for the reluctant educator (other than that it is required by law)?
6. Do you think there are transitions at the elementary level that should be addressed? If so, what are some of them?

Application Activities: For Learning and Your Portfolio

1. (Portfolio Possibility) Determine what accommodations are allowed/available for students with learning disabilities at your university. Also find out if there is any mechanism in place for a student who thinks he or she might have a learning disability to be evaluated for identification. Make a list of the accommodations that are used and the procedures used for identifying a possible learning disability.
2. Many people feel that “mirror writing” simulates what it is like to have a writing disability. Try this activity. Looking only in a mirror, write your name on a piece of paper. You should not look directly at the paper. Think about how difficult this was and what your handwriting looks like.
3. (Portfolio Possibility) There are many different approaches for measuring disorders of psychological processing. Determine what, if any, procedures/tests are used in your local school district to measure processing deficits. Create two columns on a sheet of paper. In one column, indicate the various aspects of psychological processes that are evaluated. In the other, list the corresponding test(s) that are used.
4. In the direct instruction approach described in this chapter, programming for generalization in the form of a rationale begins early in the lesson. Present three examples (one in-school and two out-of-school) for students on why they need to learn to alphabetize: street, short, state. Design a homework assignment that would provide further generalization.
5. Create a list of six mnemonics that you remember from your earlier days in school.
6. (Portfolio Possibility) Discover how services are provided to students with learning disabilities at your college or university. Is there an office for students with disabilities? Or are services provided through another mechanism? Is there any assistive technology available? If so, what? Are there support personnel? How does this compare to the secondary school services in your district?