As for the previous editions, the goal of *Educational Assessment of Students*, Seventh Edition, is to help teachers and those in training to teach to improve their skills through better assessment of students. It focuses directly on the professional practices of elementary and secondary schoolteachers. This edition features:

- A continued strong emphasis on classroom assessment, both formative and summative.
- Complete coverage of the basics as well as advanced topics and topics of contemporary interest.
- Practical advice and examples of how good and poor classroom assessments affect students’ learning.

*Educational Assessment of Students* is a core text written for a first course in educational testing and constructing classroom assessments, and it serves equally as the textbook for an undergraduate course or a first graduate course in educational assessment. No formal coursework in statistics or college mathematics is necessary to understand the text.

The book provides complete coverage of educational assessment, including developing plans that integrate teaching and assessment; using formative assessment strategies and providing effective feedback to students; crafting objective, performance, and portfolio assessments; evaluating students and discussing evaluations with parents; and interpreting state-mandated tests and standardized achievement tests.

It is important in a first course that students receive a balanced treatment of the topics. Because the book is a comprehensive treatment of traditional and alternative assessments, we give examples, discuss the pros and cons, and give guidance for crafting every assessment technique that we introduce. Research is cited that supports or refutes assessment and teaching practices.

The text prepares teachers and those in training to teach as professionals. We recognize that teachers’ experiences and judgments are necessary for proper and valid use of educational assessment. We do not hesitate to point out teachers’ and school administrators’ erroneous judgments and assessment abuses, however, where good lessons can be learned from them.

**NEW AND REVISED CONTENT**

In preparing this edition, we made a special effort to make it easy for the reader to apply the material to classroom practice through improved explanations, improved practical examples and illustrations, checklists, and step-by-step, how-to instructions. As with previous editions, we have written the text from the viewpoint that assessment is part of good teaching practice that helps the teacher improve students’ learning. Material new to the seventh edition includes:

1. A new chapter (Chapter 8) on Providing Formative Feedback and expanded coverage of Formative Assessment (Chapter 7), including a section on Feedback for English Language Learners.
2. Expanded coverage of the role and use of technology in assessment, throughout the
3. Updated information on the Common Core State Standards (CCSS), throughout the text and especially in Chapter 2 (Describing the Goals of Instruction) and Chapter 16, which contains a summary of current plans of the two state consortia working on the assessment of the CCSS and the two consortia working on alternative assessments of the CCSS.


5. Updated and expanded treatment of Standards-Based Report Cards in Chapter 15.


7. Up-to-date discussion of published achievement tests (including a new section on benchmark and interim assessments in Chapter 16), scholastic ability tests, and vocational interest inventories.

8. Update of websites related to assessment in most chapters.

SPECIAL FEATURES

The following special features highlight the practicality of this text:

1. Examples of how to craft classroom assessments and what they typically look like.

2. Checklists with succinct tips for evaluating the quality of each type of assessment taught in the book.

3. Strategies for assessing higher-order thinking that serve as models and descriptions for developing problem-solving and critical-thinking assessments.

4. Key concepts that serve to introduce each chapter.

5. Important terms and concepts listed at the beginning of the chapter and defined in both the chapter’s text and in a glossary.

6. End-of-chapter exercises that let students apply their learning to practical situations and an appendix with answers to even-numbered exercises.

7. Appendixes of statistical concepts with spreadsheet applications and tutorials for calculating reliability coefficients for instructors and students interested in a more quantitative approach than the text provides.

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CHAPTER 1

Classroom Decision Making and Using Assessment

KEY CONCEPTS
1. Assessment provides teachers with information to make decisions about teaching and provides students with information to make decisions about learning.
2. Different kinds of educational decisions require different types of assessment information.
3. Assessment, test, measurement, and evaluation are different but related terms.
4. Classroom formative and summative assessments provide teachers and students with the information they need to improve learning.
5. High-stakes assessments provide those in authority with the information they use to classify and sanction.
6. Professional guidelines for assessment competencies and assessment literacy are available.

IMPORTANT TERMS
- accountability testing
- assessment
- classification decisions
- content standards
- credentialing
- diagnostic assessments
- disaggregation of test results
- evaluation
- formative evaluation of schools, programs, or materials
- formative assessment of students’ achievement
- high-stakes assessments (tests)
- measurement
- performance standards
- placement decisions
- selection decisions
- sizing up
- summative evaluation of schools, programs, or materials
- summative assessment of students’ achievement
- test
ASSESSMENT AND CLASSROOM DECISIONS

Assessment is everywhere in schooling, sometimes hidden in plain sight. Consider this example:

Example

Meghan’s educational assessment began in kindergarten with an interview and an observation. On registration day, Meghan and her mother came to school and were interviewed briefly. A teacher rated Meghan’s cognitive and social-emotional skills. Her development was judged normal, and she attended kindergarten.

During the year, she had difficulty paying attention to the teacher and participating in group activities, although she was neither aggressive nor hostile. She was given a “readiness test” at the end of kindergarten and performed as an average child. Her teacher recommended that she continue on to first grade, but her parents balked: They didn’t think she was ready.

They took her to a child guidance clinic and requested further psychological assessment. The clinical psychologist administered an individual intelligence test and a “projective test” in which Meghan was asked to tell a story about what was happening in each of a set of pictures. The psychologist interviewed her, her parents, and her teacher. The psychologist described her as normal, both in cognitive ability and in social-emotional development.

Her parents withdrew her from the school she was attending and placed her in another school to repeat kindergarten. Later, they reported that whereas her first experience was difficult for her, her second kindergarten year was a great success. In their view, a teacher who was particularly sensitive to Meghan’s needs helped accelerate her cognitive development. By the end of the year, she had also become more confident and regularly participated in group activities.

This brief anecdote shows assessments being used early in life. Most of us recall more easily the assessments applied to us later in our lives, as older children and as adults. You may not even associate the term assessment with Meghan’s interviews. Yet, as we explain later, interviews are included in the broad definition of assessments.

Meghan’s situation also illustrates that assessment results can contribute to a decision, but everyone concerned may not interpret the results in the same way. Although Meghan’s parents may have been right to have her repeat kindergarten, there is no way of knowing what would have happened had she gone straight to first grade, because she didn’t.

Decisions involve using different kinds of information. Sometimes test scores play a major role; at other times, less formal assessments play a more dominant role. In Meghan’s case, both informal (teachers’ observations, interviews) and formal (readiness test, intelligence test, projective test) assessments were administered.

Making good classroom decisions requires more than good intentions or previous experience. Good decisions, such as what to teach, how to teach it, and how to evaluate students’ achievement, are based on high-quality information. Successful teachers obtain information about their students from high-quality assessments.

Similarly, assessment involves more than testing and grading students. Assessment involves gathering and using information to improve your teaching and your students’ learning. Whether you use teacher-made assessment procedures, assessments from your district’s curriculum materials, or state and standardized assessments, you need to be able to explain the results correctly to students, parents, other teachers, and school administrators. Further, as you develop professionally, you may have the opportunity to participate in local and state committees concerned with assessment issues. The media emphasize assessment as a major concern and consider it a newsworthy issue. It is likely to remain so for much of your professional career. This book discusses a variety of educational decisions that depend on assessments, especially in the classroom.

ASSESSMENT AND EDUCATIONAL DECISIONS ABOUT STUDENTS

Assessment provides information for decisions about students; schools, curricula, and programs; and educational policy. This section discusses several types of educational decisions made about students. It puts assessment into a broader context to give you a better idea of the purposes for which assessments are used (see Figure 1.1).

Understanding the features of different types of decisions will help you evaluate various assessment techniques that you may be considering. There is no simple answer to the question, “Is this a good assessment procedure?” An assessment procedure may serve some types of decisions
FIGURE 1.1 Examples of types of educational decisions for which assessments may be used.

Educational assessments are used for informing decisions about policy decisions about curricula, programs, and schools decisions about students that include district policy state policy national policy that include formative evaluations summative evaluations that include managing instruction placing students into programs classifying students counseling and guiding students selecting students credentialing, certifying students that includes formative assessments for purposes of summative assessments for purposes of planning instructional activities placing students into learning sequences monitoring students' progress diagnosing learning difficulties feedback to students on how to improve reporting assigning grades to students to students and parents about achievement to teacher about effectiveness
very well, others not so well. Understanding the
different types of decisions discussed in this sec-
tion will also help you explain to parents why
you used various assessments with their children.
Finally, although you may not be required to
make all of these types of student decisions your-
self, by the time your students have completed
their education they will have experienced virtually
all of them.

Instructional Decisions
Teachers make decisions about students at the
rate of one every 2 to 3 minutes (Shavelson &
Stern, 1981). That’s about 20 decisions every class
period! Sound teaching decisions require sound
information. Sound assessment procedures
gather sound information. Researchers estimate
that teachers may spend from one third to one
half of their time in assessment-related activities

To help you think about the many decisions a
teacher must make, we have organized a set of
questions teachers must answer before, during,
and after teaching. Examples of assessment meth-
ods that may give you useful information for mak-
ing the decisions are listed after each question.

Decisions Before Beginning Teaching
1. What content do I need to cover during the
next day, week, month, marking period, and so on?
Possible assessment methods: Review state stan-
dards, the curriculum, the syllabus, and the text-
book; examine copies of the standardized tests
my students will need to pass.

2. What student abilities (cultural background
factors, interests, skills, etc.) do I need to take into
account as I plan my teaching activities?
Possible assessment methods: Informal observation of stu-
dents during class discussions; conversations
with students and students’ previous teachers;
studying students’ permanent records to see their
scholastic aptitude test results, past grades, and
standardized test results; knowledge of the stu-
dent’s personal family circumstances.

3. What materials are appropriate for me to use
with this group of students?
Possible assessment methods: Class discussions in which students’
motivations, interests, beliefs, and experiences
with learning topics can be observed; results from
short pretests; study of the students’ permanent
records to learn previous teachers’ evaluations
and the students’ standardized achievement test
results.

4. With what learning activities will my students
and I need to be engaged as I teach the lesson (unit,
course)? Possible assessment methods: Review
the types of activities used previously; knowl-
edge of typical student learning progressions in
this area; analysis of the sequence of the learning
activities students will follow; review of students’
interest and achievement when those activities
were used previously.

5. What learning objectives do I want my stu-
dents to achieve as a result of my teaching?
Possible assessment methods: Review of statements of
goals and learning objectives; review of test ques-
tions students should be able to answer; review of
the things students should be able to do and of
the thinking skills students should be able to
demonstrate after learning.

6. How should I organize and arrange the students
in the class for the upcoming lessons and activities?
Possible assessment methods: Informal observa-
tion of students with special learning and social
needs; recollection of students’ behavior during
previous learning activities; information about
what classroom arrangements worked best in the
past when students were pursuing similar learn-
ing goals.

Decisions During Teaching
1. Is my lesson going well? Are students catching
on (i.e., learning)? Possible assessment methods:
Observations of students during learning activi-
ties; student responses to questions; observations
of students’ interactions.

2. What should I do to make this lesson (activity)
work better?
Possible assessment methods: Diagnosis of the types of errors students made or mis-
conceptions students have; identifying alternative
ways to teach the material; identifying which stu-
dents are not participating or are acting inap-
propriately.

3. What feedback should I give each student about
how well he or she is learning?
Possible assessment methods: Informal observation and experi-
ence on the amount and type of feedback
information different students require; information
about how close each student has come to
achieving the learning objective; students’ homework and quiz results; interviews of students.

4. Are my students ready to move to the next activity in the learning sequence? Possible assessment methods: Informal observation and checking of students’ completed work and questioning students about their understanding; analysis of students’ homework, quizzes, and test results; results of student self-assessment.

Decisions After a Teaching Segment

1. How well are my students achieving the short- and long-term instructional objectives? Possible assessment methods: Classroom tests, projects, observations, interviews with students; analysis of standardized test results.

2. What strengths and weaknesses will I report to each student and to his or her guardian or parent? Possible assessment methods: Observations of each student’s classroom participation; review of each student’s homework results; review of each student’s standardized achievement and scholastic aptitude test results when they become available; review of information about a student’s personal family circumstances.

3. What grade should I give each student for the lesson or unit, marking period, or course? Possible assessment methods: Review of summaries of the class’s performance on the important instructional objectives and on selected questions on standardized tests, and of how well the students liked the activities and lesson materials.

4. How effectively did I teach this material to the students? Possible assessment methods: Review of summaries of the class’s performance on the important instructional objectives and on selected questions on standardized tests, and of how well the students liked the activities and lesson materials.

5. How effective are the curriculum and materials I used? Possible assessment methods: Review of summaries of informal observations of students’ interests and reactions to the learning activities and materials, of the class’s achievement on classroom tests that match the curriculum, and of several past classes’ performance on selected areas of standardized tests.

These lists of questions and assessments are not exhaustive. These examples illustrate that your teaching decisions require you to use many different types of information. Further, they illustrate that the exact type of information you need varies greatly from one situation to the next. The following sections describe different kinds of instructional decisions.

Instructional Diagnosis and Remediation

Sometimes the instruction an individual student receives is not effective: The student may need special remedial help or special instruction that relies on alternative methods or materials. Assessments that provide some of the information needed to make this type of decision are called diagnostic assessments. Diagnostic decisions center on the question, “What learning activities should I use to best adapt to this student’s individual requirements and thereby maximize the student’s opportunities to attain the chosen learning objective?” Diagnosis implies identifying both the appropriate content and the types of learning activities that will help a student attain the learning objective (Nitko, 1989).

Feedback to Students

Assessments can provide feedback to students about their learning. Feedback, however, is likely to improve learning only under certain conditions. Simply assessing students and reporting the results to them is not likely to affect their performance. Learners must review both correct and incorrect performance and, in addition, be able to correct their incorrect performance. Feedback must give specific guidance to students about what to do to improve. Therefore, teachers who give students only their grade on a paper or test are not providing enough feedback to help students improve.

Assessments can be used to provide feedback that helps learning, provided you integrate them into your instructional process. Feedback from classroom assessment procedures will not help your students learn if the students lack a command of the prerequisite learning and/or have comprehended little of the lesson prior to the assessment. It is especially important that students correct their errors before you go on to new instruction. Additional discussion of feedback appears in Chapter 8.

Feedback to the Teacher

Assessments provide feedback to the teacher about how well students have learned and how well the teacher has taught.
Of course, if students have failed to grasp important points, the teacher should reteach the material before proceeding to new material.

**Modeling Learning Expectations** Assessments serve as examples for students by showing them what you want them to learn. Assessments, as well as other assignments, should therefore embody the students’ learning target (Shepard, 2006) so that students get an accurate and clear idea of what they are to learn. Students can compare their current performance with desired performance. You may teach students to identify the way(s) in which their current performance matches the expected performance and how to remedy any deficiencies. In this way, good assessment is good instruction. Also, as students evaluate their own performance, you may teach them the appropriate criteria for judging how well they are learning as well as what is important to learn.

**Motivating Students** Assessments may also motivate students to study. Unfortunately, some teachers use this form of accountability as a weapon rather than as a constructive force. Teachers may hope that using an assessment as a possible threat will encourage their students to take studying seriously. Sometimes teachers use the “surprise quiz” or “pop quiz” in this manner to encourage more frequent studying and less cramming.

Studies have not justified use of assessments this way. Rather, assessments ought to be viewed in a more positive light: as tools for instruction and feedback to students. Positive motivation comes as students understand what they need to do to improve and realize they are capable of taking those steps. Also, teachers or parents who stress test performance as the sole or major criterion for school success may create undue test anxiety for students. As a result, students may perform less well in the long run.

**Assigning Grades to Students** One of the most obvious reasons for giving classroom assessments is to help you assign grades to students. Periodically, teachers must officially record their evaluations of students’ progress. The grades or symbols (A, B, C, etc.) that you report represent your summative evaluations or judgments about how well your students have achieved important learning goals. Use a mixture of assessment formats to provide the information you need to make these evaluations. Do not use test scores alone to justify your grades. Some teachers do this because assigning grades involves evaluative decisions, and judgments are often difficult to justify and explain. Tests, especially those of the objective variety, seem to reduce judgment and subjectivity, even though this is not necessarily true. A more complete discussion of grading, including suggestions for assigning grades, appears in Chapter 15.

**Selection Decisions**

Most people are familiar with *selection decisions*: An institution or organization decides that some persons are acceptable, whereas others are not; those who are unacceptable are rejected and are no longer the concern of the institution or organization. This feature—rejection and the elimination of those rejected from immediate institutional concern—is central to a selection decision. For example, college admissions are often selection decisions: Some candidates are admitted and others are not; those who are rejected are no longer the college’s concern. (Some critics may argue that those rejected should still be of concern to society generally.)

When an institution uses an assessment procedure for selection, it is important to show that candidates’ results on the assessments bear a significant relationship to success in the program or job for which the institution is selecting persons. If data do not show that these assessment results can distinguish effectively between those candidates likely to succeed and those unlikely to succeed, then these assessment procedures should be improved or eliminated. In fact, it may be illegal to continue to use assessment results that bear no relationship to success on the job (Equal Employment Opportunity Commission, Civil Service Commission, Department of Justice, Department of Labor, & Department of the Treasury, 1979; United States Supreme Court, 1971).

Selection decisions need not be perfect to be useful, however. Assessment results cannot be expected to have perfect validity for selection, or any other, decisions (see Chapter 3). Figure 1.2 illustrates the use of imperfect assessments in selection. Some applicants would have been successful had they been selected instead of rejected (false negative decisions); and some, even though they were accepted, turned out to be unsuccessful
CHAPTER ONE  Classroom Decision Making and Using Assessment

Placement Decisions

In placement decisions, persons are assigned to different levels of the same general type of instruction, education, or work; no one is rejected, but all remain within the institution to be assigned to some level. Students not enrolled in honors sections, for example, must be placed at other educational levels. Or, first-grade students with low scores on a reading readiness test cannot be sent home. They must be placed in appropriate educational settings and taught to read. You may recognize a decision as a placement decision by noting whether the institution must account for all candidates instead of sending some away, as in selection decisions.

Most decisions in schools are placement decisions. Educators who use the language of selection are often using the language incorrectly. On closer examination, they are speaking about placement decisions. For example, when an educator speaks of “screening” students for a gifted and talented program, the decisions are actually placement decisions because their ultimate purpose is to place all students in appropriate educational programs. The schools are not free to teach some students and to reject the rest. If one instructional method is inappropriate for a particular student, then an appropriate alternative method needs to be found. In the end, all students are served.

Classification Decisions

Sometimes a decision results in a person being assigned to one of several different but unordered categories, jobs, or programs. These types of decisions are called classification decisions. For example, educational legislation concerning persons with disabilities has given a legal status to many labels for classifying children with disabilities and strongly encourages classifying them into one (or more) of a few designated categories. These categories are unordered (blindness is not higher or lower than deafness), so these are classification decisions rather than placement decisions.

You may consider classification as a more general term that subsumes selection and placement as special cases. Classification refers to cases in which the categories are essentially unordered, placement
refers to cases in which the categories represent ordered levels of education without rejection, and selection refers to cases in which students are accepted or rejected. This book considers the three types of decisions separately.

Counseling and Guidance Decisions
Assessment results frequently assist students in exploring, choosing, and preparing for careers. A single assessment result is not used for making guidance and counseling decisions. Rather, a series of assessments is administered, including an interview, an interest inventory, various aptitude tests, a personality questionnaire, and an achievement battery. Information from these assessments, along with additional background information, is discussed with the student during a series of counseling sessions. This process facilitates a student’s decision making and provides a beginning for exploring different careers. Exploring career options is likely to involve an ongoing and changing series of decisions that occur throughout a person’s life.

Credentialing and Certification Decisions
Credentialing and certification decisions reflect whether a student has attained certain standards of learning. Certification decisions may focus on whether a student has attained minimum competence or obtained a high standard, depending on the legal mandate. Certification and credentialing may be mandated by a state’s legislation or may be voluntary. If a state law requires students to achieve certain standards of performance, most often students are administered an assessment procedure created at the state level. Those who meet the standards are awarded a credential (such as a high school diploma).

Assessment procedures for certification present special problems for validation. Individual students cannot reasonably be held accountable for instruction that the teacher failed to deliver or which was delivered poorly, even though, on the average, teaching was adequate. A critical point, therefore, is whether the quality of instruction corresponds to what the assessment procedure covers. The closer the correspondence, the fairer the certification is to the student. If students did not have the opportunity to learn how to perform the tasks that appear on the certification assessment procedure, either because a specific school lacked the necessary resources or a particular teacher failed to deliver appropriate instruction, the assessment-based certification process seems inherently unjust.

Data Driven Decision Making
The phrase “data driven decision making” means analyzing, interpreting, and using data in a manner that contributes to improved instruction and increased student learning (Boudett, City, & Murnane, 2005). The phrase is recently popular, but the concept behind it, using assessment information—of all kinds, not just test scores—to inform educational decisions, is not. This section has described types of decisions educators make and the assessment information on which they should be based, and these concepts have been around for decades. The contents of this book are intended to help you develop the skills of understanding, interpreting, and using assessment information—the “data” in “data driven decision making”—in your work. In a sense, then, this whole book is about data driven decision making. The discussion of pretesting and differentiating instruction in Chapter 6 is especially relevant for classroom instructional decision making. The discussion of appropriate uses of standardized tests in Chapter 16 is especially relevant for school- and program-level decision making. However, most educational decisions benefit from considering multiple assessments at multiple levels, and we encourage you to use all the assessment concepts in this book as you make educational decisions.

DISTINCTIONS AMONG ASSESSMENTS, TESTS, MEASUREMENTS, AND EVALUATIONS
The general public often uses the terms assessment, test, measurement, and evaluation interchangeably, but it is important for you to distinguish among them. This section explains the relationship among these terms (shown in Figure 1.3) and the way assessments inform educational decisions (Figure 1.1).

Assessment
Assessment is a broad term defined as a process for obtaining information for making decisions about students; curricula, programs, and schools; and educational policy. When we say we are
“assessing a student’s competence,” for example, we mean we are collecting information to help us decide the degree to which the student has achieved intended learning outcomes. A large number of assessment techniques may be used to collect this information: formal and informal observations of a student; paper-and-pencil tests; a student’s performance on homework, lab work, research papers, projects, and during oral questioning; and analyses of a student’s records. This book will help you decide which of these techniques are best for your particular teaching situations.

**Guidelines for Selecting and Using Classroom Assessments**

In order to focus your assessment activities on the information you need to make particular educational decisions in the classroom, you need to become competent in selecting and using assessments. These five guiding principles will help you select and use educational assessments meaningfully.

1. **Be clear about the learning objectives you want to assess.** Before you can assess a student, you must know the kind(s) of student knowledge, skill(s), and performance(s) about which you need information. The knowledge, skills, and performances you want students to learn are sometimes called learning goals or standards. The more clearly you are able to specify these learning goals, the better you will be able to select the appropriate assessment techniques.

2. **Be sure that the assessment techniques you select match the learning goal.** For example, if the goal specifies that students will be able to write poetry, solve a mathematical problem, or design...
a scientific experiment, the assessments should require students to do these things. The assessment techniques selected should be as practical and efficient to use as possible, but practicality and efficiency should not be the overriding considerations.

3. Be sure that the selected assessment techniques serve the needs of the learners. Proper assessment tools are concrete examples for students of what they are expected to do with their learning. Assessment techniques should provide learners with opportunities for determining specifically what they have achieved and specifically what they must do to improve their performance. Therefore, you should select assessment methods that allow you to provide meaningful feedback to the learners. You should be able to tell students how closely they have approximated the learning goals. Good assessment is good instruction.

4. Whenever possible, be sure to use multiple indicators of performance for each learning objective. One format of assessment (such as short-answer questions or matching exercises) provides an incomplete picture of what a student has learned. Because one assessment format tends to emphasize only one aspect of a complex learning goal, it typically underrepresents that goal. Getting information about a student’s achievement from several assessment modalities usually enhances the validity of your assessments. Matching exercises, for example, emphasize recall and recognition of factual information; essay questions emphasize organizing ideas and demonstrating writing skill under the pressure of time limits; and a monthlong project emphasizes freely using resources and research to more thoroughly analyze the topic. All three of these assessment techniques may be needed to ascertain the extent to which a student has achieved a given learning standard.

5. Be sure that when you interpret—or help students interpret—the results of assessments, you take the limitations of such results into account. Although Guiding Principle 2 calls for increasing the authenticity or meaningfulness of the assessment techniques, assessments in schools cannot completely reproduce those things we want students to learn in “real life.” The information you obtain, even with several different types of assessments, is only a sample of a student’s attainment of a learning goal. Because of this, information from assessment contains sampling error. Also, factors such as a student’s physical and emotional conditions further limit the extent to which we can obtain truly accurate information. Teachers, students, and others must make decisions nevertheless. Those decisions must keep an assessment’s limitations in mind.

Tests
A test is defined as an instrument or systematic procedure for observing and describing one or more characteristics of a student using either a numerical scale or a classification scheme. Test is a concept narrower than assessment. In schools, we usually think of a test as a paper-and-pencil instrument with a series of questions that students must answer. Teachers usually score these tests by adding together the “points” a student earned on each question. By using tests this way, teachers describe the student using a numerical scale. Similarly, a preschool child’s cognitive development could be observed by using the Wechsler Preschool and Primary Scale of Intelligence (see Chapter 19) and described as having a percentile rank of 50 (see Chapter 17). Not all tests use numerical scales. Others use systematic observation procedures to place students into categories.

Although it is natural to assume that tests are designed to provide information about an individual, this is not always true. States have testing programs designed to determine whether their schools have attained certain goals or standards. Although these tests are administered to individual students, a state uses the results to measure the effectiveness of a school. In such cases, individual names are not associated with scores when reporting to the government. The “score” for the school system (or for a specific school at a specific grade level) is usually the percentage of the school’s students who meet or exceed that state’s standards.

Another example of an assessment program designed to survey the educational system rather than individual students is the National Assessment of Educational Progress (NAEP) (nces.ed.gov). The NAEP assesses the impact of the nation’s educational efforts by describing what students are able to do. Assessment tasks are assigned to students on a random sampling basis
so that not every student has the same or even comparable tasks. Thus, it is not meaningful to use the scores with individual students. The assessment is intended to pool the results from all students in the sample to show the progress of education in the entire country.

The NAEP surveys are efficient ways to gather information about the average performance of a group of students because they assess each student using very few tasks, but pool the results to estimate the average. However, this gain in efficiency of assessing the group comes at the expense of not being able to describe validly the achievement of individual students.

**Measurement**

**Measurement** is defined as a procedure for assigning numbers (usually called scores) to a specified attribute or characteristic of a person in such a way that the numbers describe the degree to which the person possesses the attribute. An important feature of the number-assigning procedure in measurement is that the resulting scores maintain the order that exists in the real world among the people being measured. At the minimum, this principle would mean, for example, that if you are a better speller than we are, a test that measures our spelling abilities should result in your score (your measurement) being higher than ours.

For many of the characteristics measured in education and psychology, the number-assigning procedure is to count the correct answers or to sum points earned on a test. Alternatively, we may use a scale to rate the quality of a student’s product (for example, an essay or a response to an open-ended mathematics task) or performance (how well the student carries out chemistry lab procedures). (See Chapter 13 for examples.) Most measurement specialists would probably agree that although a counting or rating procedure is crude, as a practical matter scores from assessments are useful when they are validated by using data from research (Kane, 2006).

Thus an assessment may or may not provide measurements. If a procedure describes a student by qualitative labels or categories but not by numbers, the student is assessed, but not measured in the sense used here. **Assessment** is a broader term than **test** or **measurement** because not all types of assessments yield measurements.

**Evaluation**

**Evaluation** is defined as the process of making a value judgment about the worth of a student’s product or performance. For example, you may judge a student’s writing as exceptionally good for his grade placement. This evaluation may lead you to encourage the student to enter a national essay competition. To make this evaluation, you would first have to assess his writing ability. You may gather information by reviewing the student’s journal, comparing his writing to that of other students and to known quality standards of writing, and so on. Such assessments provide information you may use to judge the quality or worth of the student’s writing. Your judgment that the student’s writing is of high quality would lead you to decide to encourage him to enter the competition. Evaluations are the bases for decisions about what course of action to follow.

Evaluation may or may not be based on measurements or test results. Among others, evaluations may be based on counting things, using checklists, or using rating scales. Clearly, evaluation does occur in the absence of tests, measurements, and other objective information. You can—and probably often do—evaluate students on the basis of assessments such as systematic observation and qualitative description, without measuring them. Even if objective information is available and used, evaluators must integrate it into their own experiences to come to decisions. So degrees of subjectivity, inconsistency, and bias influence all evaluations. Testing and measurement, because they are more formal, standardized, and objective than other assessment techniques, reduce some of the inconsistency and subjectivity that influence evaluation. The general public, however, sometimes thinks that because numbers look objective they remove the element of judgment from evaluation; this is called the illusion of “mechanical objectivity” (Porter, 1995, p. 4).

**Evaluation of Schools, Programs, or Materials**

Not all evaluations are of individual students. You also can evaluate a textbook, a set of instructional materials, an instructional procedure, a curriculum, an educational program, or a school. Each of these things may be evaluated during development as well as after they are completely developed. The terms **formative** and **summative** evaluation are also used to distinguish the roles...
of evaluation during these two periods (Cronbach, 1963; Scriven, 1967). Historically, these terms arose first in the context of evaluation of schools or programs and were then applied to students. The convention has become that “formative and summative evaluation” refers to schools, programs, or materials, and “formative and summative assessment” refers to students. We will follow that convention.

Formative evaluation of schools, programs, or materials is judgment about quality or worth made during the design or development of instructional materials, instructional procedures, curricula, or educational programs. The evaluator uses these judgments to modify, form, or otherwise improve the school, program, or educational material. A teacher also engages in formative evaluation when revising lessons or learning materials based on information obtained from their previous use.

Summative evaluation of schools, programs, or materials is judgment about the quality or worth of schools, already-completed instructional materials, instructional procedures, curricula, or educational programs. Such evaluations tend to summarize strengths and weaknesses; they describe the extent to which a properly implemented program or procedure has attained its stated goals and objectives. Summative evaluations appraise the effectiveness of a particular educational product as well as under what conditions it is effective. Summative evaluations usually are directed less toward providing suggestions for improvement than are formative evaluations.

Evaluation of Students You may evaluate students for formative or summative purposes, as well. Classroom formative and summative assessments both should be based on the same intended learning outcomes. Figure 1.4 shows common uses for classroom assessment results. The uses are organized into two groups: formative and summative. One use of assessment, controlling students’ behavior, is not listed in Figure 1.4 because it is a poor, and sometimes unethical, practice. Controlling students through assessments turns a process of information gathering into a process of threatening and punishing with negative consequences for learning and self-efficacy.

Formative assessment of students’ achievement means judging the quality of a student’s achievement while the student is still in the process of learning. We make formative assessments of students to guide their next learning steps. When you ask questions in class to see whether students understand the lesson, for example, you are obtaining information to formatively evaluate their learning. You can then adjust your lesson if students do not understand. Students participate in formative assessment as well, interpreting information about their own performances to adjust their learning strategies (Moss & Brookhart, 2009). High-quality formative assessment and feedback to students increase student learning (Hattie & Timperley, 2007). In general, formative assessments are less formal than summative assessments. We recommend that you record the results of these assessments to help your memory; however, you do not use them to report official letter grades or achievement progress.

Typically, you use the most informal assessments for sizing-up purposes. Sizing up means to form a general impression of a student’s strengths, weaknesses, learning characteristics, and personality at the beginning of a course or at the start of the year. The following example illustrates how a teacher pulled together various informally obtained pieces of information to size up Saleene, a fifth-grade student:

Saleene (a fifth grader) walks into class each day with a worried and tired look on her face. Praising her work, or even the smallest positive action, will crack a smile on her cheeks, though the impact is brief. She is inattentive, even during the exercises we do step by step. Saleene has a hearing disability that makes it hard for her to follow directions and classroom discussions. She is shy, but sometimes will ask for help. But before she gives herself a chance, she will put her head down on her desk and close her eyes. Her self-esteem is low. I am concerned that she will be this way all year. (Airasian, 2001, p. 38)

You can see that this teacher used information about Saleene’s cognitive, affective, and psychomotor traits to help form a general strategy for how to teach her.

Other formative decisions also require quality information. These include diagnosing individual students’ learning needs, communicating achievement expectations, using assessment in instruction, diagnosing the group’s learning needs, providing feedback, promoting student self-assessment, and planning instruction (see Chapters 7 and 8). These
### FIGURE 1.4 Examples of basic purposes for which classroom assessment results are used.

<table>
<thead>
<tr>
<th>I.</th>
<th>Formative uses help teachers monitor or guide student learning while it is still in progress.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Sizing-up uses help a teacher form initial impressions of students’ strengths, weaknesses, learning characteristics, and personalities at the beginning of the year or course.</td>
</tr>
<tr>
<td>B.</td>
<td>Diagnosing individual students’ learning needs helps a teacher and the student identify what the student has learned and what still needs to be learned, decide how instruction needs to be differentiated, and decide what feedback each student needs about how to improve.</td>
</tr>
<tr>
<td>C.</td>
<td>Diagnosing the group’s learning needs helps a teacher identify how the class as a whole has progressed in its learning, what might need to be reinforced or retaught, and when the group is ready to move on to new learning.</td>
</tr>
<tr>
<td>D.</td>
<td>Using assessment procedures as teaching tools is a way in which a teacher uses the assessment process as a teaching strategy. For example, a teacher may give practice tests or “mock exams” to help students understand the types of tasks used on the assessment, practice answering and recording answers in the desired way, or improve the speed at which they respond. In some cases, the performance assessed is identical or nearly identical to the desired learning objective so that “practicing the assessment” is akin to teaching the intended knowledge or skill.</td>
</tr>
<tr>
<td>E.</td>
<td>Communicating achievement expectations to students helps teachers clarify for students exactly what they are expected to be able to perform when their learning is complete. This communication may be done by showing the actual assessment tasks or by reviewing the various levels or degrees of performance of previous students on specific assessment tasks so that current students may be clear about the level of learning expected of them.</td>
</tr>
<tr>
<td>F.</td>
<td>Providing specific feedback gives students information about how to improve.</td>
</tr>
<tr>
<td>G.</td>
<td>Promoting students’ self-assessment helps students monitor their own learning, set goals, and take action to meet them.</td>
</tr>
<tr>
<td>H.</td>
<td>Planning instructional uses helps a teacher design and implement appropriate learning and instruction activities, decide what content to include or emphasize, and organize and manage the classroom as a learning environment.</td>
</tr>
<tr>
<td>II.</td>
<td>Summative uses help a teacher evaluate student learning after teaching one or more units of a course of study.</td>
</tr>
<tr>
<td>A.</td>
<td>Assigning grades for report cards is a way in which a teacher records evaluations of each student’s learning progress to communicate evaluations to students, their parents, and responsible educational authorities.</td>
</tr>
<tr>
<td>B.</td>
<td>Placing students into remedial and advanced courses is a way in which a teacher attempts to adapt instruction to individuals’ needs when teaching is group based. Students who do poorly in the teacher’s class may be placed into remedial classes that provide either alternate or supplemental instruction that is more suitable for the students’ current level of educational development. Similarly, students whose educational development in the subject is above that of the rest of the class may be placed into a higher-level or more enriched class.</td>
</tr>
<tr>
<td>C.</td>
<td>Evaluating one’s own teaching requires a teacher to review the learning that students have been able to demonstrate after the lessons are complete, identify which lessons were successful with which students, and formulate modifications in teaching strategies that will lead to improved student performance the next time the lessons are taught.</td>
</tr>
</tbody>
</table>

Decisions require valid information from carefully planned assessment.

**Summative assessment of students’ achievement** means judging the quality or worth of a student’s achievement after the instructional process is completed. Giving letter grades on report cards is one example of reporting your summative evaluation of a student’s achievement (see Chapter 15). Parents and school authorities interpret those grades as the progress students have made toward achieving the curriculum’s learning goals. Summative uses of assessment also help you evaluate your own teaching after you finish teaching one or more units. Placement and evaluation decisions are also summative uses for assessment results. Because of the finality of summative assessment, you should prepare to keep records of students’ results on summative assessments and ensure the validity of each result for supporting the decisions based on them.

**HIGH-STAKES ASSESSMENT AND ACCOUNTABILITY**

It may not come as a surprise to you that what you teach and how you teach it are not entirely under your control. Legally mandated external assessment programs place constraints on your teaching. You need to be aware of these as you plan your classroom instruction.

**High-Stakes Testing**

High-stakes assessments (tests) are used for decisions that result in serious consequences for school administrators, teachers, or students. Here are some examples:
In Example 1, the consequences of assessment are quite serious for individual students: If they fail to pass all subjects, they may not get a job because employers require a secondary school certificate; if they fail to do well on the examinations, they have no opportunity for attending a university. The stakes are high in Example 2, but not quite as high as in Example 1. Students can stay in school for several years, prepare for the tests, and retake the tests each year. In Example 3, there are high stakes for school administrators and teachers, but not for individual students. In fact, the tests may be low stakes for the students because there appear to be no consequences for their doing poorly on the tests.

### Accountability Testing

Although the use of high-stakes testing in the United States can be traced back to Horace Mann in the 1850s, modern high-stakes testing in the United States grew out of school reform movements that developed during the 1980s. Educational reformers and state legislators wanted to ensure that virtually all students could meet educational standards set by the state and demanded by employers. Employers needed to increase productivity and to be competitive in world markets. They needed a better-educated workforce to handle the demands of rapidly increasing technology and greater intellectual skills needed in the workplace. State legislators considered testing to be one way of holding schools accountable for students learning the educational standards set by a state.

Assessment that is used to hold individual students or school officials responsible for ensuring that students meet state standards is called **accountability testing**. Usually accountability testing is accompanied by high-stakes consequences. A state’s accountability testing may take several forms, as is shown by the examples above. A state may require both individual and school accountability, too. Check your state’s education department website for its current regulations regarding individual and school accountability.

### No Child Left Behind Act

The No Child Left Behind Act (NCLB) is important to our discussion of high-stakes assessment because it requires states to establish challenging content standards and performance standards (referred to as **achievement standards** in the NCLB literature) and to demonstrate by way of tests and other assessments how well students have attained high levels of achievement on these standards. A state’s failure to provide this demonstration results in loss of federal education funds that are authorized under NCLB. Assessment under NCLB is a school-level accountability tool.

### Standards-Based Proficiency Requirements

**Content standards** describe the subject-matter...
facts, concepts, principles, and so on that students are expected to learn. **Performance standards** describe the things students can perform or do once the content standards are learned. (We discuss state standards and how to align your learning objectives to them in Chapter 2.) When students are assessed on a state’s standards, they are classified into one of three categories for purposes of reporting to the federal government: basic, proficient, and advanced. A state may have more than three categories, but all must be aligned to these three. Under NCLB, the goal originally was for 100% of the students in each school to reach the proficient level or higher on the state’s content and performance standards by 2014. In addition, schools were to show **adequate yearly progress (AYP)** toward this goal or have sanctions imposed.

**High-Stakes Sanctions**  
NCLB sanctions and corrective actions for schools that failed to make adequate yearly progress after 2 years were quite restrictive and entirely punitive; there were no official rewards for schools that did well. In addition, reaching 100% proficiency was a statistically unattainable goal, and, as 2014 approached, more and more schools failed to meet AYP goals. Beginning in 2011, the federal government allowed states to apply for waivers from some of the NCLB requirements—such as meeting original AYP goals—and sanctions. In order to qualify for a waiver, states had to address four principles (U.S. Department of Education, 2012).

1. **College- and career-ready expectations for all students.** To qualify for a waiver of NCLB restrictions, states must demonstrate that they have college- and career-ready expectations for students, in at least reading/language arts and mathematics, by adopting standards (a) that are common to a significant number of states or (b) that are approved by a state network of institutions of higher education. They also must develop and administer annual, statewide, aligned high-quality assessments and report student growth on these standards in at least Grades 3 through 8 and once in high school. Most states will do this by signing on to the Common Core State Standards (corestandards.org) and participating in one of two consortia of states developing assessments to match them. The Common Core State Standards Initiative, coordinated by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO), released standards in English/language arts and mathematics in June 2010. The two federally funded assessment consortia are the Partnership for Assessment of Readiness for College and Careers (PARCC, parconline.org) and the Smarter Balanced Assessment Consortium (smarterbalanced.org). Both consortia aim to have assessments ready for states’ implementation by the 2014–2015 school year.

2. **State-developed differentiated recognition, accountability, and support.** To qualify for a waiver of the original NCLB sanctions, which were couched in punitive language (e.g., “failing schools”) and could include staff replacement or a state takeover of the school, states must develop and implement a system to identify schools into different categories for support. The state must set new, achievable, annual measurable objectives for all local education agencies (districts), schools, and subgroups. Using these, states will publicly recognize Title I schools making the most progress or having the highest performance as “reward schools”; publicly identify the lowest-performing schools as “priority schools,” implementing and evaluating intervention plans for those schools; and publicly identify Title I schools with the greatest achievement gaps, or in which subgroups are furthest behind, as “focus schools,” also implementing and evaluating intervention plans for those schools.

3. **Supporting effective instruction and leadership.** To qualify for a waiver of NCLB restrictions, states must develop evaluation systems for teachers and principals that use multiple sources of data, including measures of student growth and measures of professional practice. The evaluation systems should be used for continuous improvement and provide clear and timely feedback to the teachers and principals.

4. **Reducing duplication and unnecessary burden.** To qualify for a waiver of NCLB restrictions, states must remove school administrative reporting requirements that have little or no impact on student outcomes.
Disaggregation  An important provision of the NCLB Act is that a state must report test summaries at the school level and must disaggregate the data. Disaggregation of test results means that the test results for the total population of students are separated in order to report on individual subgroups of students—such as students who are poor, who are members of minority groups, who have limited English proficiency, and who have disabilities—in addition to reporting on the total student population. The reason for this requirement is that the federal government wants to ensure that states are accountable for all students learning the challenging state standards, including those in these subgroups. In some instances in the past, states reported only on the whole population of their students, thus masking the fact that some subgroups of students were not receiving quality education and were failing to meet the standards.

Assessment of Students With Disabilities  Under NCLB, all students must be assessed, including students with disabilities and students with limited English proficiency. Ninety-five percent of students with disabilities must participate in the assessment. Students’ disabilities may be used as a basis for accommodations to the assessment process when they are unable to participate under the standardized conditions set for the general student population. Further, alternative assessment methods must be found to assess those students who cannot participate even with accommodations. States are now granted some limited flexibility in adjusting content and performance standards for students with severe cognitive impairments (U.S. Department of Education, 2005).

Issues in the Current Accountability Climate  Whether NCLB assessment and accountability requirements have improved or hindered education is controversial. Advocates of strong accountability testing support the federal government’s position that “No Child Left Behind is designed to change the culture of America’s schools by closing the achievement gap, offering more flexibility, giving parents more options, and teaching students based on what works” (U.S. Department of Education, n.d.). Proponents view assessment as an objective way to ensure that all students demonstrate that learning has occurred. There is some evidence that Black-White and Hispanic-White achievement gaps have decreased since NCLB, although male-female gaps remain unchanged (Reardon, Greenberg, Kalogrides, Shores, & Valentino, 2012).

Critics point to the inevitable corruption of test scores when stakes are high, including the narrowing of the curriculum to easily tested objectives whenever the focus of the school is on improving scores on tests (e.g., Nichols & Berliner, 2008). Some have argued that the large-scale accountability tests are not instructionally sensitive, that is, they do not reflect students’ actual classroom learning (Popham, 2005). Others point out that “for special education students and the schools that serve them, the requirements of two federal education laws and their implementing regulations, the Individuals with Disabilities Education Act (IDEA) and the No Child Left Behind Act (NCLB), are in conflict” (Phillips, 2005). Finally, as tests become more rigorous, pass rates will decline, at least initially. Some states have already raised passing scores on their state accountability tests to get ready for the higher expectations for student achievement in the new Common Core assessments, and have seen such results (Ujifusa, 2012). They are working to inform the public about changes in their accountability systems.

ACQUIRING THE KNOWLEDGE AND SKILLS TO ASSESS STUDENTS  The American Federation of Teachers, the National Council on Measurement in Education, and the National Education Association published Standards for Teacher Competence in Educational Assessment of Students in 1990. These standards are somewhat dated now. Most importantly, they do not address formative assessment skills like being able to help students generate and use assessment information for their own learning. Appendix A presents a more recent synthesis of the various knowledge and skills that, taken together, comprise what today would be called “assessment literacy” for teachers. The aim of this book is to develop these understandings and skills in its readers.
CONCLUSION
This chapter introduced you to basic assessment terms and concepts as well as basic types and purposes of educational decisions. It would not be exaggerating to say that appropriate assessment information should support everything teachers and administrators do in schools. The remainder of this book is devoted to developing the knowledge and skills you will need to accomplish that assessment well. In Chapter 2, we turn to defining instructional goals, which are the foundation on which formative and summative assessment, as well as instruction, must be based.

EXERCISES
1. Self-reflect on a specific lesson you have taught or would like to teach. Make a list of the decisions you made (or need to make) before, during, and after this lesson. Next to each decision, identify how you will obtain the information needed to make the decision. What criteria might you use to judge the quality of each piece of information?
2. Decide whether each of the following statements is true or false. Defend your answers.
   a. To make evaluations, one must use measurements.
   b. To measure an important educational attribute of a student, one must use a test.
   c. To evaluate a student, one must measure that student.
   d. To test a student, one must measure that student.
   e. Any piece of information a teacher obtains about a student is an assessment.
   f. To evaluate a student, one must assess that student.
3. Describe the accountability context in your state.
   a. Obtain a copy of your state’s most recent accountability report, which should be available on your state’s education department website. How does your state currently meet NCLB reporting requirements?
   b. Has your state recently received a waiver of the original NCLB requirements, and if so, what other requirements has it put in place?
   c. Has your state endorsed the Common Core State Standards Initiative? Is your state a participant in the PARCC or Smarter Balanced assessment consortia? What is its role in the consortium (is it a governing or participating state)?
4. Classify each of these statements as reflecting a selection, classification, placement, career guidance, diagnostic/remediation, or certification decision. Defend your answers.
   a. After students begin kindergarten, they are given a battery of perceptual skills tests to decide which children should receive special perceptual skills training and which should remain in the “regular” program.
   b. A child study team decides whether each child who has been administered a series of screening tests should be included in a particular category of disability (students with hearing impairments, learning disabilities, etc.).
   c. After a school psychologist assesses a student, local education authorities assign the student to the resource room, where the teacher for students with learning disabilities gives the student special instruction each day.
   d. Each graduate of this department of education is required to take and pass the state’s test before being allowed to teach in the schools.
5. Self-reflect on each of the teacher assessment knowledge and skills found in Appendix A. Under each standard, describe the kinds of competence you now have and those that you hope to have at the end of this course.
CHAPTER 2

Describing the Goals of Instruction

KEY CONCEPTS

1. Learning objectives focus instruction and assessment, and they also focus students and teachers on the knowledge and skills intended for learning.

2. Different levels of specificity are used for statements of learning goals, state standards, content and performance standards, general and specific learning goals, and developmental and mastery learning goals.

3. Sources for locating learning goals include state standards (including Common Core State Standards), instructional materials, and professional associations.

4. Taxonomies of thinking skills help you get the most out of your learning goals and assessment tasks.

5. Before teaching, list and evaluate all your learning goals for a unit or course.

6. Specific learning objectives should be student centered, performance centered, and content centered.

7. Align both instruction and assessment to your learning goals.

IMPORTANT TERMS

affective domain
alignment study
analysis, application, comprehension, evaluation, knowledge, synthesis
cognitive domain
conceptual knowledge, factual knowledge, procedural knowledge, and metacognitive knowledge
content centered
developmental learning objective
educational goals
general learning goal
learning objective
mastery learning objectives
performance centered
psychomotor domain
specific learning objectives
standards
student centered
taxonomies of instructional objectives
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Activity 2 is the heart of the teaching process itself. Here you provide the conditions and activities for students to learn. These include formative assessment procedures like monitoring students’ progress and giving them feedback on what they need to improve their achievement of their learning targets.

Activity 3, evaluating whether learning has occurred, is summative assessment. Through it you and your students come to know how well the learning objectives have been reached. The more clearly you specify the learning targets, the more directed your teaching efforts and your students’ learning efforts will be.

These three fundamental activities are interactive rather than a straight one–two–three process. Setting clear learning objectives helps you plan your teaching efficiently, conduct your instruction—whether whole-class, differentiated by groups, or individualized—effectively, and assess student outcomes validly. Assessing and evaluating students using clearly specified learning objectives provides you with information about how to guide students’ learning and how effective your instruction has been. This information, in turn, may be used to adjust your teaching, to plan the next instructional activities, or to better specify the instructional objectives. Setting clear learning objectives also helps you communicate them to others.

Before you can design procedures to evaluate students’ learning, you should have clearly in mind the students’ performances you want to evaluate. If you are not clear on which important learning outcomes you want to evaluate, it is hardly possible to make a valid assessment of those outcomes. Statements of specific learning objectives are important for the following four aspects of classroom assessment:

1. The general planning for an assessment procedure is made easier by knowing the specific outcomes you wish students to achieve.
2. Selecting and creating assessment procedures depend on your knowing which specific achievements you should assess.
3. Evaluating an existing assessment procedure is easier when you know the specific learning objectives.
4. Properly judging the content relevance of an assessment procedure requires you to know the specific achievements you should assess (see Chapter 3).
EDUCATIONAL GOALS, STATE STANDARDS, AND LEARNING OBJECTIVES

This section discusses several closely related concepts. You might find it helpful to refer to Figure 2.1 when studying them.

Educational Goals Versus Specific Learning Objectives

Schooling and other organized instruction help students attain educational goals. One of the many ways to define educational goals is that they “are those human activities which contribute to the functioning of a society (including the functioning of an individual in society), and which can be acquired through learning” (Gagné, Briggs, & Wager, 1988, p. 39).

Example

Every student should acquire skills in using scientific measurement.

Educational goals are stated in broad terms. They give direction and purpose to planning overall educational activities. Examples of statements of broad educational goals appear in reports prepared by state departments of education, local school systems, and associations such as the National Council of Teachers of Mathematics, the American Association for the Advancement of Science, and the Association of American Geographers. Here is one example of an educational goal:

**Example**

Every student should acquire skills in using scientific measurement.

**FIGURE 2.1** Relationships among the concepts of standards, goals, and learning objectives.
These types of broad goals are organized into subject-matter areas such as mathematics and history. The broad goals, as well as statements of subject-matter area and content-specific thinking processes, serve as a curriculum framework within which you and other educators can define specific learning objectives.

**State Standards**

State education agencies take the process further by publishing expected learning outcomes or standards, and your school is held accountable for students’ achieving these particular standards. You can obtain a copy of your state’s standards from your school principal, central administration office, or your state’s education department website. **Standards** are statements about what students are expected to learn. Some states call these statements essential skills, learning expectations, learning outcomes, achievement expectations, or other names.

Often there are two sets of achievement standards. **Content standards** are statements about the subject-matter facts, concepts, principles, and so on that students are expected to learn. For example, a standard for life science might be, “Students should know that the cell nucleus is where genetic information is located in plants and animals.” **Performance standards** are statements about the things students can perform or do once the content standards are learned. For example, “Students can identify the cell nucleus in microscopic slides of various plant and animal cells.”

State education departments prepare standards used in schools. Local school districts are required to teach students to achieve these standards and are held accountable for students achieving them through the state’s assessment system. Professional organizations can prepare standards, too. These organizations try to influence what is taught by publicly promoting their own standards. Examples of professional organizations with published standards are the National Academy of Sciences, National Council of Teachers of English, and National Council of Teachers of Mathematics. Most standards from professional organizations can be found on the organizations’ websites.

The Common Core State Standards Initiative has prepared standards in English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects and in Mathematics. Released in June 2010, these standards have been adopted by 45 states. At the present time, two consortia of states are working on common state assessments and assessment systems that could take the place of individual state assessments in these content areas.

**Common Core State Standards**

Most states are beginning to use the Common Core State Standards (corestandards.org) in English/Language Arts and Mathematics as 85% or more of their state standards in these two areas. There are two main standards documents, which both have appendices, and two supporting documents: “Application of the Standards for English Language Learners” and “Application to Students with Disabilities.”

The **Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects** are organized by grade level under the categories of reading, writing, speaking, listening, and language (grammar and usage), in two levels (K through 5 and 6 through 12). In K through 5, standards for English Language Arts and for literacy in History/Social Studies, Science, and Technical Subjects are grouped together. In 6 through 12, the English Language Arts standards are described separately from the standards for literacy in History/Social Studies, Science, and Technical Subjects.

**Example**

The Common Core “Reading Standards for Literature K-5” include five areas, one of which is “Key Ideas and Details.” Anchor Standard 1 in this area states: “Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.” To support this anchor standard, a progression of learning is expected through the grade levels.

**Kindergarten:** With prompting and support, ask and answer questions about key details in a text.

**Grade 1:** Ask and answer questions about key details in a text.

**Grade 2:** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

**Grade 3:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
PART ONE  The Bases for Assessment

Grade 4: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Grade 5: Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

These standards are a bit different from most states’ English Language Arts (ELA) standards. They emphasize reading and comprehending informational texts more than most states’ prior ELA standards. The level of cognitive demand is also greater than most states’ prior standards with much more emphasis on analysis (Porter, McMaken, Hwang, & Yang, 2011). The Common Core ELA Standards have three appendices. Appendix A presents research supporting key elements of the standards and a glossary of key terms. Appendix B presents sample reading texts and sample performance tasks and is very helpful for illustrating the standards for ELA teachers. Appendix C presents samples of student writing with annotations, again very helpful for illustrating the standards for ELA teachers.

The Common Core State Standards for Mathematics are organized by grade level from K through 8 and by topic for high school. K through 8 standards are in clusters. In Grades K through 5, clusters include counting and cardinality (K only), operations and algebraic thinking, number and operations in base 10, measurement and data, and geometry. In Grades 6 through 8, clusters include ratios and proportional relationships, the number system, expressions and equations, geometry, and statistics and probability. High school topics include number and quantity, algebra, functions, modeling, geometry, and statistics and probability. As for ELA, the Common Core mathematics standards are a bit different from most states’ previous mathematics standards. They emphasize number sense, operations, measurement, and basic algebra much more, and consumer applications, advanced algebra, and instructional technology much less (Porter et al., 2011).

Example

Common Core State Standard in Mathematics 4.
NBT.1 (Grade 4, cluster Numbers and Operations in Base 10, Standard 1):

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that \(700 ÷ 70 = 10\) by applying concepts of place value and division.

The Common Core State Standards in Mathematics also have standards for mathematical practices. These standards apply to both elementary and high school content standards. The mathematical practice standards are as follows (CCSS, 2010). Students:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

The Common Core mathematics standards have one appendix, Designing High School Mathematics Courses Based on the Common Core State Standards.

Currently, states use their own standards for subjects not covered by the Common Core State Standards. The Next Generation Science Standards for Today’s Students and Tomorrow’s Workforce have just been prepared (nextgen-science.org/next-generation-science-standards).

General Learning Goals Versus Specific Learning Objectives

A general learning goal is a statement of an expected learning outcome that is derived from an educational goal or state standard. General learning goals are more specific than educational goals or standards and usually clear enough for general planning of a course. However, they need to be made more specific before they can become learning objectives that you can use when planning lessons. The following example of a general learning goal might be stated for a
primary school science unit on measurement in the metric system:

**Example**

Acquire the skills needed to use common instruments to measure length, volume, and mass in metric units.

To teach and assess this general learning goal, you may need to break it down into two or more specific learning objectives. A **specific learning objective** is a clear statement about what students are to achieve at the end of a unit of instruction. Here are three examples of specific learning objectives that are derived from the preceding general learning goal:

**Example**

1. Measure the length of objects to the nearest tenth of a meter using a meter stick.
2. Measure the mass of objects to the nearest tenth of a kilogram using a simple beam balance and one set of weights.
3. Measure the volume of liquids to the nearest tenth of a liter using a graduated cylinder.

When learning objectives are made more specific, the achievement you are to teach and to assess becomes clear. But beware of overspecificity. Long lists of very narrow “bits” of behavior can fragment the subject to be taught. The following examples show learning objectives that are too specific, along with a suggested revision:

**Example**

*The student is able to:*

Too specific: Estimate the number of beans in a jar.

Better: Solve practical problems using calculations and estimation.

Rationale: “Beans in a jar” is not the real objective of learning. Rather, it is but one of the many possible tasks that a student should complete to demonstrate achievement of estimation and calculation. The learning objective should describe this less specific achievement.

A second danger is that lists of specific objectives may become too long and be ignored. Identify a few of the most important learning objectives for each instructional unit and focus on these.

**Deriving Learning Goals and Instructional Objectives from State Standards**

After officially adopting a state’s standards, a school must make sure all students are taught and achieve those standards. Many districts use curriculum maps to specify how each of the learning goals in their curriculum are derived from standards. Different terms are sometimes used: “objectives,” “standards,” or even “learning targets.” We reserve the term “learning targets” for a particular student-centered function in formative assessment (see Chapter 7), and therefore we do not use the term for statements that are written for teachers’ planning purposes.

The example below shows how specific learning objectives are developed from a state standard and compares statements of standards, general learning goals, and specific learning objectives for third-grade reading in one school district:

**Example**

*State standard*

- Communicate well in writing for a variety of purposes.

*General learning goal*

- Write for narrative, persuasive, imaginative, and expository purposes.
Specific learning objectives

- Explains the difference between narrative, persuasive, imaginative, and expository writing purposes.
- Applies prewriting skills and strategies to generate ideas, clarify purpose, and define audience before beginning to write.
- After receiving feedback on the first draft in the areas of ideas, organization, voice, word choice, and sentence fluency, uses the feedback to revise the draft.
- Reviews and revises the second draft for grammatical correctness and proper use of standard writing conventions.

Creating Assessments That Require Students to Use Combinations of Learning Objectives

It is important to create learning and assessment situations that require students to use combinations of specific skills and knowledge to perform complex tasks and solve real-life problems. Figure 2.2 shows a beans-in-a-jar problem. In solving this problem, students are expected to use several specific skills and knowledge (listed at the upper right of the figure) to accurately estimate the number of beans in the jar. “Beans in a jar” is not the learning objective itself, of course. Rather, it is only one example of many possible tasks in which the learning objective is to apply a combination of proportional reasoning, estimation, measurement, and other skills to solve complex problems.

Notice that in this example, the most important outcomes teachers should assess are the processes and strategies students use to solve these problems. The criteria for these are listed under “criterion-referenced interpretations” in Figure 2.2. An assessment procedure that focuses exclusively on the degree of correctness of students’ answers to tasks like this would be invalid because it misses assessing the processes that students use.

Specific Learning Objectives as Mastery Statements

Assessment focuses on what you can see students doing. From this observation, you will infer whether they have attained the learning objectives. For example, a high school biology unit on living cells may have as a general learning goal that students should “learn the organizations and functions of cells.” But what can the student do to demonstrate learning of this general goal? There may be several answers to this question, each phrased as a specific instructional objective and each describing what a student can do, as shown in the following example:

Example

1. The student can draw models of various types of cells and label their parts.
2. The student can list the parts of a cell and describe the structures included in each.
3. The student can explain the functions that different cells perform and how these functions are related to each other.

Statements of what students can do at the end of instruction may be called mastery learning objectives. They have also been called specific learning outcomes and behavioral objectives.

Mastery Learning Objectives Versus Developmental Learning Objectives

Some skills and abilities are more aptly stated at a somewhat higher level of abstraction than mastery learning objectives to communicate that they are continuously developed throughout life. Consider the following examples:

Examples

1. Combine information and ideas from several sources to reach conclusions and solve problems.
2. Analyze and make critical judgments about the viewpoints expressed in passages.
3. Use numerical concepts and measurements to describe real-world objects.
4. Interpret statistical data found in material from a variety of disciplines.
5. Write imaginative and creative stories.
6. Use examples from materials read to support your point of view.
7. Communicate your ideas using visual media such as drawings and figures.

Because of the lifelong nature of these objectives, they may be called developmental objectives (Gronlund & Brookhart, 2009) or developmental learning objectives.
FIGURE 2.2  An example of a complex assessment task.

BEANS IN A JAR
Applying rate and ratio
In the task for this benchmark, students were first shown a jar filled with beans and asked to estimate the number of beans. They were then asked to work out the number of beans more accurately using any of the following materials: a calculator, a balance scale and masses, a ruler, a graduated cylinder, and a transparent centimeter-squared grid. They were told they could count some but not all of the beans. If the students did not know how to proceed, the evaluators suggested they weigh a small handful of beans. The students were asked to keep an ongoing record of their solutions. After they had solved the problem, they were asked to describe the problem and their solutions.

<table>
<thead>
<tr>
<th>Norm-referenced interpretations</th>
<th>Task score</th>
<th>Criterion-referenced interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>20% of the students scored (80% scored lower than 5)</td>
<td>5</td>
<td>The student understands the problem and immediately begins to search for a strategy, perhaps experimenting with different methods and materials before proceeding. The student monitors the solution as it develops and may check and remeasure. The student uses the materials efficiently and accurately and keeps a good record of the data. All the calculations are performed accurately and a reasonable answer is produced. The student gives a clear explanation of the solution demonstrating sound reasoning with proportions. The student takes ownership of the task and enjoys its challenge.</td>
</tr>
<tr>
<td>19% of the students scored (61% scored lower than 4)</td>
<td>4</td>
<td>The student may make some false starts and may be helped by the evaluator to get focused. The student may use some materials to no purpose or inaccurately, perhaps confusing volume and mass. The student reasons with proportions correctly. Although stuck at various points in the solution, the student perseveres and usually produces a reasonable answer. The student usually gives a clear explanation and enjoys the activity.</td>
</tr>
<tr>
<td>20% of the students attained (41% scored lower than 3; the average score is 3.0)</td>
<td>3</td>
<td>There is some confusion in one or more aspects of the solution to the problem. The student may confuse units, make arithmetic errors, or perform incorrect operations. The student may have some idea of proportionality but is unable to use it correctly. The student does not use the materials to the best advantage. The student seeks assistance from the evaluator. Although not totally confident, the student may persevere in an attempt to arrive at an answer to the problem.</td>
</tr>
<tr>
<td>24% of the students attained (17% scored lower than 2)</td>
<td>2</td>
<td>The student may make a start at solving the problem but is unable to complete a solution. The student may repeatedly switch methods and materials and be unable to find an effective strategy. There is considerable confusion with units and the interpretation of various measurements. The student usually guesses at the operations that should be performed with the data. The student lacks confidence and seeks a great deal of assistance from the evaluator.</td>
</tr>
<tr>
<td>17% of the students attained</td>
<td>1</td>
<td>The student may estimate the number of beans but gives no response or very limited response to working out the number more accurately.</td>
</tr>
</tbody>
</table>

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At first glance, it might seem that all one needs to do is to insert a “can do” phrase in front of each of the preceding statements to transform them to mastery learning objectives. However, it is not that simple. First, each statement represents a broad domain of loosely related performances. Second, each statement represents skills or abilities typically thought of as developing continuously to higher levels rather than the all-or-none dichotomy implied by the mastery learning objectives.

The Problem of a Broad, Heterogeneous Domain Consider Developmental Learning Objective 2 in the previous list. Now, think about questions you could ask students to assess how well they have achieved this learning objective. Your questions need to require students to analyze a reading passage and make inferences based on information in it. The example below shows three possible questions. These questions are passage-based items from the National Assessment of Educational Progress civics test. The numbers in the brackets are the percentage of twelfth-grade students who answered each question correctly.

Example

1. In what way does the article show one of the strengths of federalism? [32%] (2006-12C7, question 9)
2. In what fundamental way do the two quotes above show different understandings of the rights of citizens? [51%] (2006-12C7, question 3)
3. The events at Central High School in Little Rock showed that . . . [60%] (2006-12C5, question 17)

You can see that each question refers to a different passage with different viewpoints expressed. Further, the percentage of students answering one question is quite different from the percentage answering another. Studies of these types of questions show that those who answer one question right are not necessarily the same students who get another question right. We can conclude from this that Developmental Learning Objective 2 represents a broad domain of reading passages and that mastering one part of the domain does not mean mastering another. This is the case with developmental learning objectives like those listed previously.

The Issue of Continuous Development of Skill The second concern, the continuous or developmental nature of these learning objectives, stems from the fact that even the simplest developmental objective is a matter of degree. Continuous development is possible throughout life. All we can reasonably expect to do for a particular course or unit of instruction is to identify a sample of specific learning outcomes that represent degrees of progress toward the objectives. The essential concern here is that the skills represented by these learning objectives are complex, the number of tasks that can be used to demonstrate learning is vast, and each represents goals to work toward continuously rather than to master completely (Gronlund & Brookhart, 2009).

Teaching and Assessing Developmental Learning Objectives One way to begin designing instruction and assessing progress toward developmental objectives is to list several specific learning outcomes for each objective. The outcomes should represent the key performances expected of a student at a particular grade level. This principle is illustrated in the following example, which clarifies a broad instructional objective in science by listing several specific learning outcomes that support it:

Example

Developmental learning objective: Interprets and uses Boyle’s law to explain phenomena and solve problems.

Specific learning outcomes clarifying this developmental objective:
1. States a definition of Boyle’s law.
2. States the domain to which Boyle’s law applies.
3. Describes the relationship between Boyle’s law and Charles’s law.
4. Uses Boyle’s law to explain an observation in a lab experiment.
5. Appropriately analyzes a new (to the student) situation in terms of Boyle’s law.
6. Solves a new problem or makes an appropriate choice for a course of action, taking into account the implications of Boyle’s law.

Although this list of six specific outcomes might be made longer, the six would likely be considered adequate for describing what is meant
by “interpreting and using Boyle’s law” at the end of an introductory course in high school physics. Specific tasks could then be prepared for assessing achievement of the six specific outcomes. Some tasks might assess only one of these learning outcomes; others could require a student to use several of these outcomes in combination. A student’s overall score could be interpreted as indicating the degree to which a student has acquired the ability to interpret and use Boyle’s law, rather than as a “mastery/nonmastery” description.

SOURCES FOR LOCATING LEARNING OBJECTIVES
You may find lists of learning objectives in instructional materials and teachers’ manuals, local and state curriculum frameworks, the Common Core State Standards, state websites containing performance standards, reports of the National Assessment of Educational Progress, books on teaching methods, manuals accompanying tests (especially criterion-referenced tests), and reports from educational associations. More than likely you will have to adapt the learning objectives you find in these sources to your own situation. Nevertheless, these sources do provide a starting place: It is much easier to adapt and revise learning objectives statements than to write them without any assistance.

Also, a learning objective often will cut across several lessons or subject areas. The objective of being able to use library and print resources to obtain information for a report, for example, is likely to be common to social studies, mathematics, and language arts curricula. The taxonomies in the next section were created so that each category would apply across several curricular areas.

TAXONOMIES OF LEARNING OBJECTIVES
Simply writing learning objectives “off the top of your head” can be frustrating because a seemingly endless number of possible objectives exist. Further, you are likely to write first those objectives that have a very narrow focus, specify content topics, and represent lower level cognitive skills. A taxonomy can help you bring to mind the wide range of important learning objectives and thinking skills.

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Taxonomies of instructional learning objectives are highly organized schemes for classifying learning objectives into various levels of complexity. Generally, educational learning objectives fall into one of three domains, although a complex performance may involve more than one of them.

1. Cognitive domain: Objectives focus on knowledge and abilities requiring memory, thinking, and reasoning processes.
2. Affective domain: Objectives focus on feelings, interests, attitudes, dispositions, and emotional states.
3. Psychomotor domain: Objectives focus on motor skills and perceptual processes.

Learning objectives within each domain may be classified by using a taxonomy for that domain. Because there is more than one way to define a classification scheme, several different taxonomies have been developed for sorting learning objectives in a given domain. Only two of these taxonomies for the cognitive domain are described here. Other cognitive domain taxonomies are summarized in Appendix D. Chapter 6 will discuss using taxonomies to develop an assessment plan. The other chapters in Part II discuss creating tasks to assess learning objectives at different taxonomy levels.

COGNITIVE DOMAIN TAXONOMIES
Taxonomies are not teaching hierarchies. Their only purpose is to classify various learning objectives and assessment tasks. For example, you should not teach “recall” first and “higher order thinking” second. If you did that, younger and lower-achieving students would be doomed to spend all their time on drill. Use the taxonomy to help you explore each learning objective at several levels. A taxonomy gives you a tool to judge whether you have taught and assessed a wide enough range of thinking skills. Including a wide range of thinking skills in an assessment usually improves its validity.

It is also important to recognize that student performance on complex tasks involves using several thinking skills at the same time. It is possible, therefore, to classify a given learning objective or assessment task into more than one taxonomy category (Krathwohl, 2002). For most classroom purposes, classify each learning objective into the
category that represents the thinking skill that is (a) most prominently used or (b) the main intent of the learning objective or assessment task. Then use the classification to decide if some important skills have received too little or too much attention in your teaching and assessment.

Bloom’s Taxonomy

The *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain* (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956) had an enormous influence on how we think of educational goals and teaching practice. This taxonomy is a comprehensive outline of a range of cognitive abilities that you might teach, classified into six major headings arranged from simple to complex.

The six main headings of the original Bloom’s taxonomy are Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.

1. **Knowledge** involves the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material (p. 201).

2. **Comprehension** represents the lowest level of understanding. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications (p. 204).

3. **Application** involves the use of abstractions in particular and concrete situations to solve new or novel problems. The abstractions may be in the form of general ideas, rules of procedure, or generalized methods. The abstractions may also be technical principles, ideas, and theories, which must be remembered and applied (p. 205).

4. **Analysis** involves the breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed are made explicit. Such analyses are intended to clarify the communication, to indicate how the communication is organized and conveys its effects, and to identify its basis and arrangements (p. 205).

5. **Synthesis** involves the putting together of elements and parts so as to form a whole. This process involves working with pieces, parts, elements, and so on, arranging and combining them in such a way as to constitute a pattern or structure not clearly there before (p. 206).

6. **Evaluation** requires judgments about the value of material and methods for given purposes, quantitative and qualitative judgments about the extent to which materials and methods satisfy criteria, and the use of a standard of appraisal. The criteria may be determined by the student or supplied to him (p. 207).

Revised Bloom’s Taxonomy

**Relationship of the Revision to the Original** The original *Taxonomy of Educational Objectives* has been revised as *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives* (Anderson et al., 2001). The revised taxonomy improves on the original by adding a two-dimensional framework into which you may classify learning objectives and assessment items. The two dimensions are the Knowledge Dimension and Cognitive Process Dimension.

The Cognitive Process Dimension is very much like the original Bloom’s *taxonomy*. Its categories are Remember, Understand, Apply, Analyze, Evaluate, and Create. The cognitive processes of Synthesis and Evaluation from the old taxonomy have switched their order and become Evaluate and Create in the new taxonomy. This change makes sense, in that evaluation requires making a judgment after analyzing something against criteria while creating requires putting together something new. The definitions of the Cognitive Process Dimension categories remain like the original Bloom’s taxonomy definitions presented above, with one exception: Knowledge.

Bloom’s original Knowledge category has been divided into two parts: the Knowledge Dimension and the Cognitive Process category Remember. The Knowledge Dimension has four subcategories: **Factual Knowledge**, **Conceptual Knowledge**, **Procedural Knowledge**, and **Metacognitive Knowledge**. The Knowledge Dimension contains the type of content a learning objective refers to: factual knowledge, conceptual knowledge, procedural knowledge, or metacognitive knowledge.
The Taxonomy Table  A two-dimensional table is constructed to describe the location of a learning objective and its corresponding assessment on both dimensions simultaneously (see Figure 2.3). The figure shows 24 cells, each defined by one Knowledge and one Cognitive Process subcategory. Note that the subcategories of the Knowledge Dimension are lettered, whereas the subcategories of the Cognitive Process Dimension are numbered. As a shortcut, we can refer to a particular cell by its letter and number. Thus, a learning objective that requires students to remember some factual knowledge is placed in cell 1A.

Classifying Learning Objectives and Assessment Items  Suppose you are teaching students to understand the elements that authors use when writing short stories. Suppose the short stories you select all concern people’s personal problems and that the characters in these stories handle their personal problems inappropriately. The sample learning objectives and questions that follow may help you direct your assessment plans. Later chapters will detail how to design assessment tasks. At this point, we are studying only the range of thinking skills that should be taught and assessed. Also, remember that the examples are classified into the most appropriate cell(s) in the taxonomy and that they may also overlap into some of the other cells.

Example  

**Remember Factual Knowledge [1A]**

**Sample learning objective:** Recall the main characters in each of the short stories read and what they did.

**Sample assessment items:**

1. List the names of all of the characters in “Witch’s Forest.”
2. In “Witch’s Forest,” what did Sally do when her mother refused to let her go into the forest?

**Example  

**Understand Conceptual Knowledge [2B]**

**Sample learning objective:** Explain the main ideas and themes of the short stories that we read.

**Sample assessment item:** Write using your own words what “Witch’s Forest” was all about.
Example

Apply Conceptual Knowledge [3B]

Sample learning objective: Relate the personal problems of the characters in the short stories that we read to problems that real people face.

Sample assessment item: Are the problems Sally had with her mother in the story similar to the problems you or someone you know has with his or her mother? Explain why or why not.

Example

Analyze Procedural Knowledge [4C]

Sample learning objective: Identify the literary devices that authors use to convey their characters’ feelings to the reader.

Sample assessment item: In “Witch’s Forest,” Sally was upset with her mother. In “Dog Long Gone,” Billy was upset with his brother. What words and phrases did the authors of these two stories use to show how upset these characters were? Explain and give examples.

Example

Evaluate and Create Using Conceptual and Procedural Knowledge [5B,C;6B,C]

Sample learning objectives: (1) Develop one’s own set of three or four criteria for judging the quality of a short story. [6B,C] (2) Use the three or four criteria to evaluate several new stories that were not read in class. [5B,C]

Sample assessment items: (1) So far we have read four short stories. What are three or four different traits that make a story high quality? Use these traits to develop three or four criteria that you could use to evaluate the quality of any short story. (2) Read the two new short stories assigned to you. Use the criteria you developed to evaluate these two stories. Evaluate each story on every criterion. Summarize your findings.

Example

Create Using Conceptual and Procedural Knowledge [6B,C]

Sample learning objective: Describe, across all of the stories read, the general approach that the characters used to resolve their problems unsuccessfully.

Sample assessment item: So far we have read “Witch’s Forest,” “Dog Long Gone,” “Simon’s Top,” and “Woman With No Manners.” In every story, one character was not able to solve the personal problem he or she faced. What were the ways these characters tried to solve their problems? What do these unsuccessful ways to solve problems have in common?

Figure 2.4 shows how learning objectives in science and social studies may be classified in the revised taxonomy. The value of such a taxonomy is that it calls your attention to the variety of abilities and skills toward which you can direct instruction and assessment.

Advantage of the Revised Taxonomy

The advantage of the revised taxonomy is that it allows you to consider a broader range of learning objectives than the original one-dimensional taxonomy. If you classify your learning objectives, your assessment items, and your teaching activities into the Taxonomy Table shown in Figure 2.3, you can immediately see the types of knowledge and thinking on which your instructional unit focuses. Not every unit should have learning objectives and assessments in every one of the 24 cells, of course. But over the semester, your teaching should address and evaluate students’ learning in all (or nearly all) of them.

Different Modes of Assessments for Different Taxonomy Levels

Learning objectives classified in the first three cognitive categories are more easily assessed with short-answer, true-false, multiple-choice, or matching test items. Learning objectives classified in the last three cognitive categories might be partially tested by such item formats, but their assessment usually requires a variety of other procedures such as essay questions, class projects, observing
CHAPTER TWO  ■ Describing the Goals of Instruction

FIGURE 2.4  How different outcomes for science and social studies may be classified using the Anderson et al. revised taxonomy.

<table>
<thead>
<tr>
<th>Anderson et al. Category</th>
<th>Science</th>
<th>Social Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember</td>
<td>• Recall the names of parts of a flower</td>
<td>• List known causes of the Civil War</td>
</tr>
<tr>
<td></td>
<td>• Identify and label the parts of insects</td>
<td>• Recall general principles of migration of peoples of Africa</td>
</tr>
<tr>
<td></td>
<td>• List the steps in a process</td>
<td>1B</td>
</tr>
<tr>
<td></td>
<td>1A</td>
<td>1B</td>
</tr>
<tr>
<td></td>
<td>1A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1C</td>
<td></td>
</tr>
<tr>
<td>Understand</td>
<td>• Explain the digestive processes in one’s own words</td>
<td>• Explain the meaning of technical concepts in one’s own words</td>
</tr>
<tr>
<td></td>
<td>2B</td>
<td>• Give examples of propaganda usage from current events</td>
</tr>
<tr>
<td></td>
<td>2B</td>
<td>2B</td>
</tr>
<tr>
<td>Apply</td>
<td>• Use scientific principles to make a simple machine</td>
<td>• Use specified principles to explain current events</td>
</tr>
<tr>
<td></td>
<td>• Find real examples of igneous rock and mineral formations</td>
<td>• Carry out a survey and collect data from the field</td>
</tr>
<tr>
<td></td>
<td>3B,C</td>
<td>3B,C</td>
</tr>
<tr>
<td></td>
<td>3B</td>
<td></td>
</tr>
<tr>
<td>Analyze</td>
<td>• Show how scientific principles or concepts are applied in the design of a refrigerator</td>
<td>• Identify the credible and noncredible claims of an advertisement for clothing</td>
</tr>
<tr>
<td></td>
<td>4B,C</td>
<td>• Show the different component parts of a political speech</td>
</tr>
<tr>
<td></td>
<td>4B</td>
<td>4B</td>
</tr>
<tr>
<td>Evaluate</td>
<td>• Use criteria or standards to evaluate the conclusions drawn from the research findings</td>
<td>• Use a specific set of criteria to evaluate several political speeches</td>
</tr>
<tr>
<td></td>
<td>5B,C</td>
<td>5B</td>
</tr>
<tr>
<td>Create</td>
<td>• Determine what the rule is that underlies the results obtained from several experiments or investigations</td>
<td>• Show the similarities among several schools of social thought</td>
</tr>
<tr>
<td></td>
<td>6B</td>
<td>• Develop plans for peace between two countries</td>
</tr>
</tbody>
</table>

Because it is sometimes difficult for teachers to classify learning objectives into all six cognitive categories, some schools have opted to use a shorter version of the Bloom taxonomy. For example, some have reduced it to three categories: Remember (or Knowledge), Understand (or Comprehension), and Higher-Order Thinking. The “Higher-Order Thinking” category collapses Apply, Analyze, Evaluate, and Create learning objectives into one group. Other schools formed three categories somewhat differently: Remember and Understand (Knowledge and Comprehension), Apply, and Higher-Order Thinking (including Analyze, Evaluate, and Create). The advantage of these condensations is that they eliminate the need for struggling with how to classify learning objectives into one of the top three categories of the taxonomy. A disadvantage of using a condensed version of the taxonomy is that teachers may stop trying to teach learning objectives in the Evaluate and Create categories because, after condensing, Apply and Analyze—generally easier skills to assess—will be in the same category as Evaluate and Create.

Webb’s Depth of Knowledge Levels
As part of the No Child Left Behind legislation, states have been required to show evidence that the state accountability tests are well matched with the state standards they are intended to measure. Alignment studies are conducted to document this match. Most alignment studies are concerned with both the content and the level of cognition represented in the test. One widely used method for conducting alignment studies was developed by Webb (1997). Expert review data are often sought to document whether the test items and standards match in content, whether they match in level of cognitive challenge, and whether they match in relative emphasis or weight given to each standard. As part of
this methodology, Webb developed a taxonomy called Depth of Knowledge (Webb, 1997; Webb, Herman, & Webb, 2007).

The Depth of Knowledge levels are four broad categories that can apply across different content areas. Their general descriptions are as follows (Webb, Herman, & Webb, 2007).

Level 1—Recall
- Recall a fact, definition, or simple procedure
- Apply a simple algorithm or formula (solve a one-step problem)
- Example verbs: identify, recall, recognize, use, and measure

Level 2—Skill/Concept
- Make a mental decision requiring more than rote action or recall
- Interpret information, read a graph, notice patterns
- Solve a two-step problem
- Example verbs: classify, organize, estimate, make observations, collect and display data, compare data

Level 3—Strategic Thinking
- Reason, plan, use evidence, make conjectures
- Explain one’s thinking
- Perform tasks that have multiple ways to give good responses
- Example verbs: explain, plan, reason

Level 4—Extended Thinking
- Use complex reasoning, perform extended tasks over time
- Design and conduct experiments
- Draw conclusions or synthesize ideas across multiple texts
- Example verbs: design, make connections, synthesize

Appendix D presents more specific examples of work at each of the four levels in specific subject areas: English language arts, mathematics, science, and social studies.

Choosing a Taxonomy
We have discussed two different schemes for classifying cognitive learning objectives, Bloom’s and Webb’s. There are many more taxonomies that we have not discussed, some of which are in Appendix D of this book. Which one should you use? That depends on whether this is a personal decision for use in your classroom only or a more general decision about a taxonomy that will be used throughout your school system.

✔ Checklist
Criteria for Selecting a Taxonomy of Cognitive Learning Objectives

1. Completeness: To what degree can your major learning objectives be classified within this taxonomy?
   - Not at all
   - Somewhat
   - To a great extent

2. Point of view: To what extent can this taxonomy be used as a platform for explaining your teaching methods or your curriculum characteristics to others?
   - Not at all
   - Somewhat
   - To a great extent

3. Reform: To what extent can this taxonomy help you evaluate your curriculum and learning objectives and revise as needed?
   - Not at all
   - Somewhat
   - To a great extent

4. Simplicity: How easy is it for parents, teachers, and education officials to understand this taxonomy?
   - Not at all
   - Somewhat
   - To a great extent

5. Reporting: How useful is this taxonomy in organizing reports on assessment results for individual students, educational officials, government officials, or the public?
   - Not at all
   - Somewhat
   - To a great extent

To choose among the various taxonomies, apply the practical criteria in the checklist to judge each taxonomy or classification scheme you are considering. If the decision is a personal one for a single classroom, then not all criteria may apply.

EVALUATING THE LEARNING OBJECTIVES OF A COURSE OR UNIT
Prepare a complete list of the learning objectives for a unit before you teach it. A complete list is not necessarily long. You can use this checklist to evaluate your list of learning objectives:

✔ Checklist
Checklist for Evaluating a List of Learning Objectives for a Course or Unit

1. Are all the learning objectives appropriate for students’ educational level?
2. Is the list of learning objectives limited to only the important outcomes for the course or unit?
3. Are all the learning objectives consistent with your state’s published learning standards?
4. Are all the learning objectives consistent with your local school’s philosophy and general goals?
5. Can all the learning objectives be defended by currently accepted learning principles?
6. Can all the learning objectives be taught within the time limits of the course or unit?
7. Can all the learning objectives be taught with available teaching resources?

**HOW TO WRITE SPECIFIC LEARNING OBJECTIVES**

To be useful for classroom instruction and assessment (Gronlund & Brookhart, 2009) learning objectives must be:

1. **Student centered**: Objectives focus on the student.
2. **Performance centered**: Objectives are worded in terms of what a student can perform after the required learning experiences.
3. **Content centered**: Objectives state the specific content to which the student should apply the performance.

**Student Centered**

Because instruction focuses on changes in student performance, learning objectives should describe student performances. It is not unusual, however, for some teacher guides, curriculum frameworks, and other materials to contain statements that do not focus on the student. Consider this statement:

**Example**

Poor: Provide the opportunity for students to express their opinions in classroom discussions about why peace is so difficult to attain.

Better: A student will express his or her opinion in classroom discussions about why peace is so difficult to attain.

Student-centered learning objectives allow you to decide whether the students actually have achieved what you intended from the lesson.

**Performance Centered**

A learning objective should state a performance—that is, an observable activity. You can accomplish this kind of statement by including an action verb that specifies a student performance.

To help beginners write learning objectives that describe students’ performances, Figure 2.5 lists further examples of various action verbs. These verbs are organized according to the cognitive dimension of the Anderson et al. revised taxonomy. When verbs such as these are used in statements of learning objectives, the objectives

<table>
<thead>
<tr>
<th>FIGURE 2.5</th>
<th>Action verbs to use when writing learning objectives.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Remember</th>
<th>Understand</th>
<th>Apply</th>
<th>Analyze</th>
<th>Evaluate</th>
<th>Create</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define, describe, explain, identify, label, list, match, name, outline, reproduce, select</td>
<td>Convert, describe, distinguish, estimate, extend, generalize, give examples, paraphrase, rewrite, summarize</td>
<td>Apply, change, classify (examples of a concept), compute, demonstrate, discover, modify, operate, predict, prepare, relate, show, solve, use</td>
<td>Analyze, arrange, associate, compare, contrast, infer, organize, solve, support (a thesis)</td>
<td>Appraise, compare, conclude, contrast, criticize, evaluate, judge, justify, support (a judgment), verify</td>
<td>Classify (infer the classification system), construct, create, extend, formulate, generate, synthesize</td>
</tr>
</tbody>
</table>
will usually satisfy the second criterion of expressing
observable student performance.
A balance is necessary between verbs that are
too broad (and thus imply too many nonequiva-
lent performances) and those that are too specific
(and which are often just ways of marking
answers). Consider this learning objective, which
is stated too specifically:

Example

Poor: The student is able to put an X on the picture of
the correct geometric shape (circle, triangle, rectangle,
square, or ellipse) when the name of the shape is given.

The main intent of such an objective is to select
or identify the correct shape, not just to make Xs.
Any response that indicates the student has cor-
rectly identified the required shape is acceptable.
Thus, the learning objective should be written as:

Example

Better: The student is able to identify a picture of a
geometric shape (circle, triangle, rectangle, square,
or ellipse) when the name of the shape is given.

Figure 2.6 suggests some verbs that maintain
this balance and illustrates other verbs that are
too specific or too broad to make useful state-
ments of learning objectives.

Content Oriented
A learning objective should indicate the content
to which a student’s performance is to apply. The
following learning objective is poor because it
lacks a reference to content:

Example

Poor: The student is able to write definitions of the
important terms used in the text.

To modify this learning objective you need to
include a reference to a specific list of “important
words” or in some other way describe them:

Example

Better: The student is able to write definitions of the
terms listed in the “Important Terms” sections of
Chapters 1 through 5 of the textbook.

FIGURE 2.6 Action verbs sometimes used in learning objectives.

| Specific but acceptable verbs |  |
|-------------------------------|  |
| add, total                    |  |
| alphabetize                   |  |
| choose                        |  |
| complete, supply              |  |
| construct, make               |  |
| convert                       |  |
| count                         |  |
| delete                        |  |
| describe                      |  |
| divide                        |  |
| draw                          |  |
| explain                       |  |
| identify                      |  |
| label                         |  |
| list                          |  |
| match                         |  |
| measure                       |  |
| multiply                      |  |
| name                          |  |
| order, arrange                |  |
| pick out                      |  |
| regroup                       |  |
| rename                        |  |
| rephrase                      |  |
| select                        |  |
| sort, classify                |  |
| state                         |  |
| subtract, take away           |  |
| weigh                         |  |

| Too broad, unacceptable verbs |  |
|--------------------------------|  |
| apply                          |  |
| deduce                         |  |
| do                             |  |
| examine                        |  |
| generate                       |  |
| infer                          |  |
| interpret                      |  |
| observe                        |  |
| perform                        |  |
| respond                        |  |
| test                           |  |
| use                            |  |

| Too specific, essentially indicator verbs |  |
|---------------------------------------------|  |
| check                         |  |
| circle                        |  |
| color the same as               |  |
| draw a line between             |  |
| draw a ring around              |  |
| put a box around                |  |
| put a mark on                   |  |
| put an X on                     |  |
| shade                          |  |
| underline                      |  |
| write the letter of             |  |
| write the number of             |  |

| Toss-up verbs, requiring further clarification |  |
|------------------------------------------------|  |
| answer                         |  |
| collect, synthesize            |  |
| compare                        |  |
| contrast                       |  |
| demonstrate                    |  |
| determine                      |  |
| differentiate                  |  |
| discriminate                   |  |
| distinguish                    |  |
| give                           |  |
| locate                         |  |
| predict                        |  |
If you do not refer to content in your learning objective, you will be uncertain whether an assessment task is valid for evaluating the student. For example, the assessment may require students to define words that, although in the text, may be unimportant. Without knowing the content, it is difficult for anyone to determine what, if anything, was learned.

ALIGNING ASSESSMENT TASKS WITH LEARNING OBJECTIVES

Chapters 6 through 14 discuss the details of creating high-quality assessments. Here we wish simply to point out that the basic purpose of any assessment is to determine the extent to which each student has achieved the stated learning objectives. Although this purpose sounds straightforward, it is not always an easy criterion to meet. The validity of your assessment results determines the quality of your evaluation. Validity has many aspects (see Chapter 3); here we discuss validity only in relation to matching assessment tasks to learning objectives.

Aligning Assessments to Mastery Learning Objectives

The specific tasks or procedures you use in an assessment should require the student to display the skill or knowledge stated in the learning objective. For instance, if the main intent of your learning objective is for a student to build an apparatus, write a poem, or perform a physical skill, your assessment procedure must give the student the opportunity to perform. Assessment procedures that require a student only to name the parts of an apparatus, to analyze an existing poem, or to describe the sequence of steps needed for performing a physical skill do not require the performance stated in these learning objectives. Therefore, they would be invalid for assessing them: They are not aligned to the learning objectives’ main intents. A very basic requirement for the validity of classroom assessment procedures is that the assessment procedures should be aligned with the intentions of the specific learning objectives that you include in your assessment plan.

Aligning Assessments to Developmental Learning Objectives

As is often the case, developmental learning objectives define a broad domain of performance application. To ensure the validity of your classroom assessment, you may need to assess the same learning objective in several different ways. For example, you might assess writing achievement both by scoring several samples of students’ written assignments and by using a grammar and usage test. The test provides the opportunity to assess grammar and usage that might not appear in the natural course of the student’s writing, but that may well be part of the learning objective. Observing a student’s natural writing habits permits you to infer how well the student is likely to use language in typical writing situations. Using both procedures increases how comprehensively you assess the student’s writing ability and the validity of your evaluation.

Another reason for using more than one assessment procedure is to obtain more reliable results. Your subjective evaluation of a student’s written essay on a topic might be supplemented by a test made up of more objectively scored items. Combining the less reliable information about the student’s written work (that is, your subjective evaluation) with the more reliable information (the objectively scored test) yields a more reliable overall evaluation result. Reliability is discussed in more detail in Chapter 4.

Aligning Assessments to State Standards

Earlier in this chapter, we showed how you can derive your learning objectives from your state’s standards. It is important that you maintain consistency by aligning your classroom assessments as well as the learning objectives with the state’s standards. First, align your assessments with the learning objectives that you derive from the state’s standards (in the manner we showed earlier). Second, ensure that your assessments match the span of content covered by the standards, the depth of thinking implied by the standards, the topical emphasis in the standards, and the same types of performances as are specified in the standards.
CONCLUSION
Well-conceived learning objectives are the foundation for both instruction and assessment. They are also the means by which instruction and assessment are coordinated. Such coordination or alignment is the basis for valid classroom assessment. In Chapter 3, we consider the broader concept of validity for both classroom and large-scale assessment.

EXERCISES
1. Write three specific learning objectives for a lesson you plan to teach. Explain how each objective meets the three criteria: student centered, performance centered, and content centered.
2. Following are three learning objectives. Decide whether each is a mastery learning or a developmental learning objective. Explain your choices.
   a. The student is able to take the square root of any number using a handheld calculator.
   b. The student is able to determine whether the thesis of the argument is supported adequately.
   c. When given data, the student is able to construct a graph to describe the trend in the data.
3. Obtain a copy of the Common Core State Standards in either English/language arts or mathematics.

Select one unit you are teaching or plan to teach in the future that is based on one or more of these standards. Explain what you would need to do to align your classroom learning objectives and student assessments with the standard(s) you selected. Summarize the results and report them to your class.

4. Decide whether each learning objective listed here belongs to the cognitive, affective, or psychomotor domain. Does the performance of each learning objective require some use of elements from domains other than the one into which you classified it? Which one(s)? Explain why. Does this mean you should reclassify that objective? Explain.
   a. The student is able to adjust a television to get the best color resolution.
   b. The student demonstrates knowledge of parliamentary law by conducting a meeting without violating parliamentary procedures.
   c. The student contributes to group maintenance when working with classmates on a science project.
   d. The student makes five baskets in 10 attempts on the basketball court while standing at the foul line.