

Guiding Philosophy

Teaching through Text: Reading and Writing in the Content Areas, Second Edition, embodies certain beliefs about teachers and about learning through text. This book inevitably reflects these beliefs, which we regard as mainstream views based defensibly on available research and informed opinion. Specifically, we contend that

- The most effective content area teachers know their materials and their students and purposefully acquire information on both;
- An important (and almost unassailable) priority of most content area teachers is the acquisition of content;
- Content literacy techniques must therefore be included only insofar as they are likely to enhance such learning (rather than merely improve general reading skills);
- The best learners from text actively engage in a process of constructing, verifying, and extending meaning as they read;
- Content area teachers are ideally placed to maximize such interaction between their students and their materials; and
- This result is most likely to be achieved when both reading and writing (the two domains of literacy) are integrated.

Our goal was to produce a book that provides a wide variety of suggestions for instructional practice that is consistent with these beliefs. We have tried very hard to include only those recommendations that have been validated through research and that teachers tend to regard as practical. This task has not been easy because of the multitude of ideas now in the literature. Rather than offer a comprehensive review of these ideas, we have sifted through them in a search for those that have proved both practical and effective.

Organization of the Book

This text is organized into five sections, each containing two or more chapters. Section 1 provides background in literacy and addresses second language and cultural challenges. Section 2 takes a closer look at planning, focusing on activities that might precede a reading assignment, such as introducing vocabulary. Section 3 presents ways of guiding students' reading to ensure that what they derive from an assignment corresponds with teacher expectations. Section 4 discusses methods of following up assigned reading so that learning is reinforced and extended. Section 5 provides more techniques for helping students use literacy for developing an understanding of course content and for enhancing their attitude toward content literacy.

Each chapter begins with an organizing diagram that visually summarizes the chapter's main components. Chapter content is summarized verbally at the end of the chapter. Readers are encouraged to become more active readers by means of problem sets titled Getting Involved, which follow the summary of each chapter. Here, activities are suggested for applying chapter content and for making it specific to the student's teaching area.

We have attempted by several means to make the ideas presented in this book thoroughly understandable and enjoyable. One is the inclusion of numerous graphic aids, including diagrams, charts, definitions, and illustrations. We also use the unique device of the concept bridge, indicated by the bridge symbol, which links key ideas across the book. Another feature, perhaps also unique to this text, is the integration of quotations from noted writers who, throughout the years, have addressed the very topics we examine.



Substantial Changes in the Second Edition

A number of changes make the second edition of *Teaching through Text* a more valuable resource in learning about content literacy. These enhancements include the following:

- A recurring feature called Assisting English Learners. These features complement chapter content by describing how it can be adapted or expanded to scaffold the learning of English language learners.
- An extended discussion of disciplinary literacy and its relationship to content literacy.
- An extended discussion of the Common Core Standards and their implications for content literacy instruction.
- A discussion of academic vocabulary and its relationship to content and general vocabulary.
- Completely updated references.
- New examples illustrating salient points made in the text.
- Extended discussion of the Lexile Framework and its usefulness in content literacy instruction.
- Expanded treatment of discussion approaches, including Collaborative Reasoning.
- A discussion and example of text sets that are linked to lexiles.
- Additional writing applications, which are integrated throughout the book.
- Additional web resources for promoting all aspects of content literacy.

If, in this new edition, we have succeeded in creating a tool for moving content area teachers to consider, actively and openly, both the problems and the potential of using literacy in their classrooms, then the labors of constructing this book will have been rewarded.



The Power of Classroom Practice

In *Preparing Teachers for a Changing World*, Linda Darling-Hammond and her colleagues point out that grounding teacher education in real classrooms—among real teachers and students and among actual examples of students’ and teachers’ work—is an important, and perhaps even an essential, part of training teachers for the complexities of teaching in today’s classrooms. MyEducationLab is an online learning solution that provides contextualized interactive exercises, simulations, and other resources designed to help develop the knowledge and skills teachers need. All of the activities and exercises in MyEducationLab are built around essential learning outcomes for teachers and are mapped to professional teaching standards. Utilizing classroom video, authentic student and teacher artifacts, case studies, and other resources and assessments, the scaffolded learning experiences in MyEducationLab offer preservice teachers and those who teach them a unique and valuable education tool.

For each topic covered in the course you will find most or all of the following features and resources.

Connection to National Standards

Now it is easier than ever to see how coursework is connected to national standards. Each topic on MyEducationLab lists intended learning outcomes connected to the appropriate national standards. All of the activities and exercises in MyEducationLab are mapped to the appropriate national standards and learning outcomes as well.

Assignments and Activities

These assignable exercises are designed to enhance student understanding of concepts covered in class and to save instructors preparation and grading time. They show concepts in action (through video, cases, and/or student and teacher artifacts). They help students deepen content knowledge

and synthesize and apply concepts and strategies they read about in the book. (Correct answers for these assignments are available to the instructor only under the Instructor Resource tab.)

Building Teaching Skills and Dispositions

These learning units help students practice and strengthen skills that are essential to quality teaching. After presenting the steps involved in a core teaching process, students are given an opportunity to practice applying this skill via videos, student and teacher artifacts, and/or case studies of authentic classrooms. Providing multiple opportunities to practice a single teaching concept, each activity encourages a deeper understanding and application of concepts, as well as the use of critical thinking skills. **A+RISE**

As part of your access to MyEducationLab, A+RISE[®], developed by three-time Teacher of the Year and administrator, Evelyn Arroyo, gives new teachers in grades K–12 quick, research-based strategies that get to the “how” of targeting their instruction and making content accessible for all students, including English language learners (ELLs).

A+RISE[®] Standards2Strategy[™] is an innovative and interactive online resource that offers new teachers in grades K–12 just-in-time, research-based instructional strategies that:

- Meet the linguistic needs of ELLs as they learn content.
- Differentiate instruction for all grades and abilities.
- Offer reading and writing techniques, cooperative learning, use of linguistic and nonlinguistic representations, scaffolding, teacher modeling, higher-order thinking, and alternative classroom ELL assessment.
- Provide support to help teachers be effective through the integration of listening, speaking, reading, and writing along with the content curriculum.
- Improve student achievement.
- Are aligned to Common Core Elementary Language Arts standards (for the literacy strategies) and to English language proficiency standards in WIDA, Texas, California, and Florida.

Lesson Plan Builder Activities

The Online Lesson Plan builder is a tool that helps familiarize new and prospective teachers with the steps of a lesson plan, providing them with a concrete structure that accounts for all the necessary elements, and allowing them quick access to important components including state and national standards.

Look for activities on the MyEducationLab for your course that link directly into the Online Lesson Plan Builder. You’ll see video of a classroom and be offered the opportunity to determine a goal and craft a lesson for the group. If you take advantage of this opportunity, you will be scaffolded to remember to focus on specific learning outcomes, incorporate standards, and focus on the individual needs of learners.

IRIS Center Resources

The IRIS Center at Vanderbilt University (<http://iris.peabody.vanderbilt.edu>), funded by the U.S. Department of Education’s Office of Special Education Programs (OSEP), develops training enhancement materials for preservice and in-service teachers. The center works with experts from across the country to create challenge-based interactive modules, case study units, and podcasts that provide research-validated information about working with students in inclusive settings. In your MyEducationLab course, we have integrated this content where appropriate.

Simulations in Classroom Management

One of the most difficult challenges facing teachers today is how to balance classroom instruction with classroom management. These interactive simulations focus on the classroom management issues teachers most frequently encounter on a daily basis. Each simulation presents a challenge scenario at the beginning and then offers a series of choices for solving each challenge. Along the way students receive mentor feedback on their choices and have the opportunity to make better

choices if necessary. Upon exiting each simulation, students will have a clear understanding of how to address these common classroom management issues and will be better equipped to handle them in the classroom.

Study Plan Specific to Your Text

A MyEducationLab Study Plan is a multiple-choice assessment tied to chapter objectives and supported by study material. A well-designed Study Plan offers multiple opportunities to master required course content as identified by the objectives in each chapter:

- *Chapter Objectives* identify the learning outcomes for the chapter and give students targets to shoot for as they read and study.
- *Multiple-Choice Assessments* assess mastery of the content. These assessments are mapped to chapter objectives, and students can take the multiple-choice quiz as many times as they want. These quizzes provide overall scores for each objective, and they also explain why responses to particular items are correct or incorrect.
- *Study Material: Review, Practice and Enrichment* gives students a deeper understanding of what they do and do not know related to chapter content. This material includes text excerpts; activities that incorporate hints and feedback; and interactive multimedia exercises built around videos, simulations, cases, or classroom artifacts.

Course Resources

The Course Resources section on MyEducationLab is designed to help students put together an effective lesson plan; prepare for and begin their career; navigate their first year of teaching; and understand key educational standards, policies, and laws.

The Course Resources Tab includes the following:

- The **Lesson Plan Builder** is an effective and easy-to-use tool that students can use to create, update, and share quality lesson plans. The software also makes it easy to integrate state content standards into any lesson plan.
- The **Preparing a Portfolio** module provides guidelines for creating a high-quality teaching portfolio.
- **Beginning Your Career** offers tips, advice, and other valuable information on:
 - *Resume Writing and Interviewing*: Includes expert advice on how to write impressive resumes and prepare for job interviews.
 - *Your First Year of Teaching*: Provides practical tips for setting up a first classroom, managing student behavior, and more easily organizing for instruction and assessment.
 - *Law and Public Policies*: Details specific directives and requirements teachers need to understand under the No Child Left Behind Act and the Individuals with Disabilities Education Improvement Act of 2004.
- **Longman Dictionary of Contemporary English Online** is the online version of the CD-ROM of the Longman Dictionary of Contemporary English—the quickest and easiest way to look up any word while readers are working on MyEducationLab.

Certification and Licensure

The Certification and Licensure section is designed to help students pass their licensure exam by giving them access to state test requirements, overviews of what tests cover, and sample test items.

The Certification and Licensure tab includes the following:

- **State Certification Test Requirements**: Here students can click on a state to discover the list of state certification tests for that particular state.
- Students can click on the **Licensure Exams** they need to take to find:
 - Basic information about each test.
 - Descriptions of what is covered on each test.
 - Sample test questions, with explanations of correct answers.

- **National Evaluation Series™ (by Pearson):** Here students can see the tests in the National Evaluation Series (NES); learn what is covered on each exam; and access sample test items, with descriptions and rationales of correct answers. They can also purchase interactive online tutorials developed by Pearson Evaluation Systems and the Pearson Teacher Education and Development group.
- **ETS Online Praxis Tutorials:** Readers can purchase interactive online tutorials developed by ETS and by the Pearson Teacher Education and Development group. Tutorials are available for the Praxis I exams and for select Praxis II exams.

New! CourseSmart eTextbook Available

CourseSmart is an exciting new choice for students looking to save money. As an alternative to purchasing the printed textbook, students can purchase an electronic version of the same content. With a CourseSmart eTextbook, students can search the text, make notes online, print out reading assignments that incorporate lecture notes, and bookmark important passages for later review. For more information, or to purchase access to the CourseSmart eTextbook, visit www.coursesmart.com.

Visit www.myeducationlab.com for a demonstration of this exciting new online teaching resource.

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Teaching and Learning through Text

Never before have educators so actively discussed and so extensively researched the development of literacy. Reading and writing are no longer isolated issues but touch all areas of learning, including content subjects. The goal of this section is to provide the groundwork you will need to understand exactly how literacy can enhance (or limit) your students' learning.

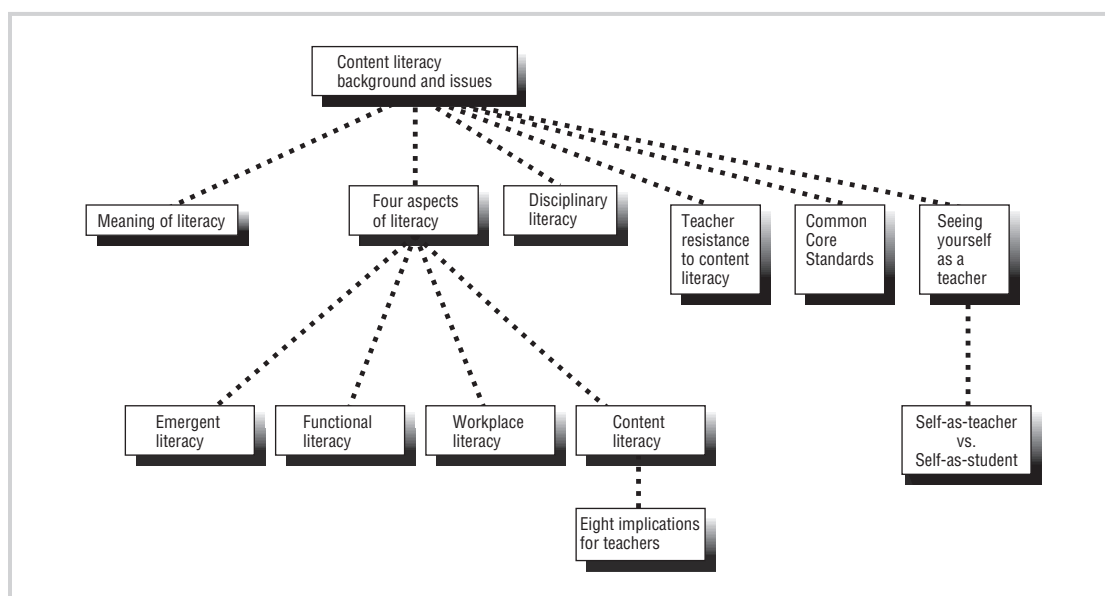
Chapter 1 defines literacy and describes its relationship to the oral language processes of speaking and listening. We then introduce four important aspects of literacy, one of which is its potential in content area classrooms. This fourth aspect we call content literacy.

Chapter 2 describes reading and writing as language processes. We examine how an individual's purposes and background greatly influence what is learned through reading. We then look at writing as a process guided by intentions, a process of great usefulness as a means of refining and clarifying what we know about a subject.

Chapter 3 compares ways of gathering information about the needs of students. We look at three areas: (1) the reading ability of students, (2) the demands of reading materials, and (3) the suitability of instructional practices.

Chapter 4 discusses the challenges teachers face in meeting the educational needs of a diverse classroom. Students have always varied, of course, but demographic trends have created a much richer variety, influencing what students believe and how they learn. This chapter describes important dimensions of present-day diversity and offers practical suggestions for appropriate planning.

The Importance of Literacy in Content Areas



*The mass of every people must be barbarous
where there is no printing.*

—Samuel Johnson

Why should content area teachers be concerned with literacy? In the words of one teacher, “Isn’t it enough to know about my teaching specialty without having to worry about reading and writing as well?” Throughout this book, we will address this important question in various ways.

This chapter is devoted to the term *literacy* and its implications for how students acquire content knowledge and skills. We begin with a discussion of what it means to be a literate person because your eventual answer to this question (and it is you who must answer it!) will determine in large part your decisions concerning the role of literacy in your classes.

Objectives

After reading this chapter you should be able to

1. discuss whether content area teachers should be “teachers of reading,” noting the principal reasons for and against this position;
2. define the various aspects of literacy, including emergent, functional, workplace, and content literacy;
3. describe how content literacy facilitates greater content achievement;
4. summarize the role of content literacy in the Common Core Standards;
5. note some of the false assumptions many teachers have about reading and writing in the content fields; and
6. develop the beginnings of a philosophy toward content literacy in regard to the eventual role it will play in your own teaching.

The Meaning of Literacy

While we might all agree on the importance of being literate, defining literacy is a difficult and divisive task. Past definitions have often entailed the measurement of a few narrowly selected abilities (Kuhn, Schwanenflugel, & Meisinger, 2010; McDougall, 2010; Ntiri, 2009; Thorvaldsen, Egeberg, Pettersen, & Vayik, 2011). At one time, a literate person was one who was able to sign his or her name, or who had reached a certain grade level in school, or who had scored above a predetermined point on a test. Often the application of these definitions of literacy was handled in an arbitrary and prejudicial manner, as with the infamous and so-called literacy tests that once determined which individuals were qualified to vote.

Today, literacy is typically thought of in much broader terms and is seen as one of the avenues by which individuals interact in social contexts. The literate are defined not simply as those who have attained a certain level of proficiency in language ability, but rather as those who are able to use written materials effectively in the environment in which they live and work (Miller, McCardle, & Hernandez, 2010; White, Chen, & Forsythe, 2010; Wolf, Aspin, Waite, & Ananiadou, 2010).

For the concept of literacy to be meaningful, you must think of it in relation to the unique requirements of the context in which it is to be used (Downer, Sabol, & Hamre, 2010; Johnson, 2010). This context may be as large as a nation or as small as a classroom. Each situation presents unique requirements, and adequate language proficiency in one situation might be inadequate in another.

To illustrate just how relative literacy can be, consider yourself in the following contexts:

- Your friend, a biology major, is hospitalized and asks you to summarize some assigned readings. As you begin, you encounter sentences like this one: “The endosteum is the vascular connective tissue lining the marrow cavities of bones.”
- After driving across the border into Mexico, you see a sign containing the single word *Alto*. Luckily, it is printed on a red octagonal background.
- You buy an unassembled shelf and encounter instructions like this: “Fasten flange G to tie-rod Q using hex nut R and a socket wrench.”
- You receive a text message that simply reads as follows: u at

Of course, it is possible that your personal background makes one or more of these contexts no problem at all. You may actually be a biology major, for example, or you may speak Spanish. Chances are, however, that some of the situations presented difficulties precisely because you lacked the literacy skills required. This is a humbling realization, but it underscores how the same person can be literate in some contexts yet nearly illiterate in others.

We can define literacy in either broad or narrow terms. For example, Farris, Fuhler, and Walther (2004) take a narrow and traditional approach. To them, literacy is “the ability to read and understand what others have written, along with the ability to write as a means of recording

information and for communicating with others” (p. 5). This definition is useful for most purposes, but a broader conception of literacy helps us appreciate how reading and writing are just two of many symbol systems through which we interpret and convey information. We now speak of multiple literacies, an idea that includes digital icons, the visual arts, music, drama, and even dance (Baker, 2010; Richards & McKenna, 2003; Voithofer & Winterwood, 2010).

Whether you are literate may change with the situation in which you find yourself. Can you navigate through a complex Web site? Can you “read” the tone of voice used by an actor? Can you integrate visual aids with accompanying text? Beginning with the work of Gray (1969) and extending through periodic national assessments of reading, literacy has come to mean a person’s performance in relation to the need to use literacy skills in a particular social setting (Ash, 1998; Cairney, 2000; Lloyd, 2010; Strong 1998; Venezky, 1995).

Four Aspects of Literacy

Recent research has led to a new appreciation for the complexity of literacy processes. One important consequence has been an abandonment of the notion that literacy is a single state or set of skills. In this section, we develop this notion by discussing four diverse aspects of literacy: emergent, functional, workplace, and content literacy. It will become clear that these aspects, while distinct in many respects, are nevertheless highly interconnected and interdependent.

Emergent Literacy

An unmoded view of learning to read and write holds that a child begins to acquire these abilities only upon entry into the formal settings of school instruction. The kindergarten teacher’s job was to prepare children for actual literacy instruction (to begin in first grade) by undertaking an extensive regimen of “readiness” training.

A view that squares more accurately with the results of research (Cunningham, 2010; Dooley, 2010; Phillips, Gorton, Pinciotti, & Sachdey, 2010; Reynolds, Wheldall, & Madelaine, 2010; Son & Morrison, 2010) is that literate behavior and experiences begin long before schooling and that there is really no magic moment in the life of a child at which readiness for instruction occurs. Literacy acquisition is now seen instead as a gradual process that begins in the home. Literate behavior has been observed to emerge slowly in young children, a process described by Tompkins (2003) as follows:

Children’s introduction to written language begins before they come to school. Parents and other caregivers read to young children, and children observe adults reading. They learn to read signs and other environmental print in their community. Children experiment with writing and have their parents write for them. They also observe adults writing. When young children come to kindergarten, their knowledge about written language expands quickly as they participate in meaningful, functional, and genuine experiences with reading and writing. (p. 111)

The task of primary teachers is now increasingly perceived as a matter of building on this groundwork. In short, their job is to take children at their individual points of development and help literacy continue to emerge.

Functional Literacy

The notion of functional literacy is one of the most complex, dynamic, and elusive concepts encountered by educators. One reason for this difficulty is the political significance of the term. When functional literacy is defined broadly, large numbers of people are classified as illiterate; narrower definitions result in rosier pictures (Thompkins & Binder, 2003). In general, the term denotes the ability to use reading and writing to function adequately in one’s environment, including in one’s job; functional literacy includes the more specific concept of workplace literacy, which we will discuss presently. Because functional literacy varies with an individual’s environment (including the demands of employment), no single level of literacy can possibly suffice to make everyone functional—unless, of course, we use the highest standard of proficiency for all individuals.

In one popular though misguided conceptualization, functional literacy has been separated from workplace demands so that the functionally literate person is sometimes seen as one who is able to read a newspaper, street signs, and other “public” information and write a check or fill out an application when the need arises. It is difficult, however, to see how persons who are able to do these things and who are yet unequal to the literacy demands of their jobs can possibly be regarded as functionally literate.

Muller and Murtagh (2002) described functional literacy in the following manner:

[Functional] literacy is more than the ability to read, write, and do arithmetic. It comprises other skills needed for an individual’s full autonomy and capacity to function effectively in a given society. It can range from reading instructions for fertilizers, or medical prescriptions, knowing which bus to catch, keeping accounts for small business, or operating a computer. (p. 4)

Such a description serves to make clear how functional literacy has at last come to be viewed as a concept relative not just to everyday uses of print but to the demands of the workplace as well.

Workplace Literacy

In recent years, literacy demands in the workplace have drawn increased attention. At one time, the assumption was that traditional education would provide the necessary language abilities for most jobs, but this belief has changed as the realities of occupational demands have changed. The need for increasingly higher levels of literacy in particular jobs, as well as the general shift from industrial to service occupations, has made workplace literacy a growing concern (Folinsbee, 2010; Miller, McCardle, & Hernandez, 2010; Smith, Smith, & Smith, 2010).

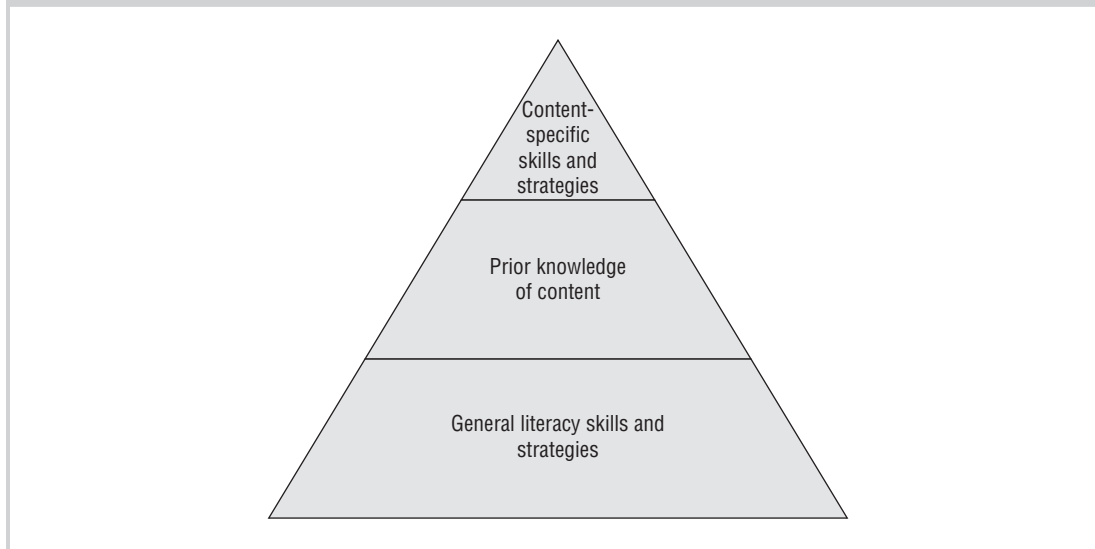
In the past, a prospective office worker needed to know only basic keyboarding skills. In today’s world, however, this level of literacy knowledge is not sufficient in most business settings. Skills in word processing, for example, and technical reading are necessary for all but the most elementary office positions. By 1990, approximately 70 percent of American jobs required some degree of literacy (Howie, 1990). This figure is now undoubtedly higher. In contrast with literacy needs in the past, workplace literacy today requires individuals who can apply general learning strategies in a wide variety of situations.

How do workers acquire these skills? While some skills are developed on the job, the foundations of literacy ability are formed in school, and in numerous ways the foundation may be a weak one. Reading and writing have traditionally been taught in academic settings primarily as a means of acquiring and transmitting information via print. This policy is defensible, as far as it goes, but it stops short of what many students will need in the workplace. Increasingly, literacy instruction has been moved from the academic setting to the workplace (Craig, 2001; Darwin, 2001; Scholtz & Prinsloo, 2001). Students have been graded on what they are able to remember from a reading assignment rather than on how they can apply this knowledge. Formal writing instruction tends to be limited in scope, receiving far less attention than reading. Yet the literacy demands of today’s workplace go far beyond the simple ability to read and recall specific information and to convey it to others through writing. Workers must be skilled in knowing how to set their own specific purposes for reading and how to choose reading strategies for achieving these purposes. In writing, they must often be able to analyze, synthesize, predict, and persuade rather than simply inform.

In many ways, the content classroom is comparable to the workplace: It places specific literacy demands on students as they attempt to accomplish the day-to-day tasks of the course. What has been called workplace literacy in the industrial world has a counterpart in the world of education. We call this counterpart *content literacy*.

Content Literacy

We define content literacy as *the ability to use reading and writing for the acquisition of new content in a given discipline* (McKenna & Robinson, 1990). Such ability includes three principal cognitive components: (1) general literacy skills, (2) prior knowledge of content, and (3) content-specific literacy skills (such as map reading in the social studies). (See Figure 1.1.) The first two

FIGURE 1.1**Cognitive components of content literacy**

of these—overall literacy ability and content knowledge—are clearly the two factors with the greatest influence on learning through text (Perfetti, 2003).

Obvious connections exist between the content area classroom and the workplace. Both require knowledge in specific areas, and both make special demands on participants that may change dramatically as they move to a new setting. Both may involve highly specialized literacy requirements germane to that setting and to few others. However, content literacy differs considerably from workplace literacy in purpose; it is primarily a tool for learning, not for job performance.

The potential of writing for the purpose of learning has only recently been realized. Researchers now recognize that both reading and writing are constructive processes in which information is organized and accommodated into memory structures. Accordingly, the writing-to-learn movement stresses that writing, like reading, is a means of clarifying, refining, and extending one's internalization of content (Gilbert & Graham, 2010; McDermott, 2010; Montelongo, Herter, Ansaldo, & Hatter, 2010; Nuckles, Hubner, Dumer, & Renkl, 2010; Stewart, Myers, & Culley, 2010; Troia, Shankland, & Heintz, 2010). Writing, like reading, becomes a tool for acquiring content.

The Implications of Content Literacy

The concept of content literacy has a number of important implications for content area teachers, and we believe that these implications lead to a single, inescapable conclusion: By engaging students in appropriate content literacy activities, teachers can optimize learning. We suggest the following specific implications (McKenna & Robinson, 1990):

1. *Content Literacy Is Not the Same as Content Knowledge.* The term *literacy* is often used to mean "having knowledge" of a particular area. A person who is computer literate, for example, is assumed to know about computers. Unfortunately, this kind of usage gets us dangerously far from reading and writing. The term *content literacy* is not merely a synonym for content knowledge. Instead, it represents skills needed to acquire knowledge of content. Nor is content literacy a prerequisite for content knowledge, for one can certainly acquire knowledge of content without recourse to reading or writing. On the other hand, content knowledge *is* a prerequisite for content literacy. In a cyclical pattern, the more prior knowledge one possesses, the more such knowledge will facilitate reading and writing as activities that lead to the integration of still more

*What's a book?
Everything or
nothing. The eye
that sees it is all.*

RALPH WALDO
EMERSON

knowledge, and so forth. In short, the more you know about a given area, the easier it is to learn new material in the same area.

2. *Teaching Content Automatically Makes Students More Content Literate.* Whether they know it or not, content area teachers enhance their students' ability to read and write about content simply by teaching it. Ironically, even those teachers who refuse to embrace the ideas of "reading in the content areas" and "writing to learn" improve their students' ability to read and write within their disciplines whenever their instruction is successful. Enhanced prior knowledge always enhances subsequent reading and writing germane to that knowledge. Unfortunately, many teachers, by providing high-quality direct instruction, set the stage for even greater levels of content acquisition (through reading and writing) but never realize this potential with appropriate assignments.

3. *Content Literacy Is Content-Specific.* To be literate in mathematics, for example, is not a matter of merely "knowing" mathematics. It is being able to read and write about the subject as an effective means of knowing still more about it. While the general ability to read and write obviously bears on one's success in reading and writing about a specific subject, prior knowledge of the specific topics involved is a vital variable of content literacy. Thus, an individual who is highly literate in math may have a far lower level of literacy in history or economics. This circumstance is largely the result of differences in prior knowledge and occurs even though the individual brings the same general literacy skills to all reading and writing tasks.

4. *In Content Literacy, Reading and Writing Are Complementary Tasks.* While reading and writing can serve well enough as alternative means of enhancing content learning, the greatest gains can be expected when the two are used in tandem. When printed materials are assigned to be read and when written responses are also required, students are placed in the position first of constructing an internal representation of the content they encounter in print and then of refining that representation through such processes as synthesis, evaluation, and summarization.

5. *Content Literacy Is Germane to All Subject Areas, Not Just Those that Rely Heavily on Text.* Teachers of subjects such as art, music, physical education, and others that tend to involve little use of prose materials have frequently objected that content area reading coursework, now compulsory in nearly every state (Come, McKenna, & Robinson, 1996; Lovette, 2012), does not apply to their instructional situations. Certain states have in fact excluded such groups from these course requirements. The notion of content literacy, however, suggests that students' understanding of the content presented in all subjects could be substantially enhanced through appropriate writing assignments. While the primary presentation may comprise lecture and demonstration rather than reading, and while the principal domain involved may be psychomotor rather than cognitive, content learning nevertheless invariably includes the understanding of key concepts and their interrelationships. Such understanding can always be fostered through writing.

6. *Content Literacy Does Not Require Content Area Teachers to Instruct Students in the Mechanics of Writing.* A long-standing misinterpretation that has hampered the effort to encourage content area reading techniques is that such techniques call for subject matter specialists to teach the minutiae of decoding—to master a new and very different curriculum, in other words, and, worse, to take class time away from subject matter instruction. This false notion has lingered tenaciously despite widespread efforts to overcome it. We need to make clear, then, in elaborating the idea of content literacy (which embraces writing as well as reading), that the concept includes no responsibility for developing the mechanical skills of writing. As Myers (1984) put it, "Writing to learn is not learning to write" (p. 7). Mechanical problems severe enough to distort meaning may require a teacher's attention, especially in subjects like mathematics, in which precise usage is an absolute necessity (Orr, 1987), but the focus should be meaning, not mechanics.

7. *Content Literacy Is Relative to the Tasks Expected of Students.* The literacy requirements of a classroom, like those of a workplace or of an entire culture, readily define who is literate and who is not (Guthrie, 1983; Hadaway & Young, 1994; Moje, 1993; Rafferty, 1992; Wedman & Robinson, 1990; Williams, 2007). In an effort to reduce or eliminate the "illiterate"

subpopulation in their classes, teachers all too frequently resort to slashing literacy requirements. Reading assignments may be circumvented or minimized, while writing may never be seriously considered. Students consequently meet the literacy demands of the instructional setting—so that all are technically “literate”—but the opportunity to enhance content learning through reading and writing is lost. Students at even a rudimentary level of general literacy are equipped to advance their understanding through literacy activities. This is possible whenever (1) reading materials are commensurate with ability (or steps are taken to facilitate comprehension of more difficult material) and (2) writing assignments are within the range of student sophistication.

8. *Content Literacy Has the Potential to Maximize Content Acquisition.* While reading content materials may introduce new ideas into a student’s knowledge base, and while writing about content may help the student organize and store that information more effectively, some argue that similar results may also be accomplished without reliance on reading and writing. Instructors may indeed spoon-feed new content in carefully organized curricular designs using direct oral instruction. This argument has been strong enough to persuade some teachers to avoid literacy activities altogether. However, there are at least four good reasons for not depending exclusively on direct instruction:

- The products of literacy activities will never precisely match those of oral instruction. Therefore, they serve to complement such instruction and broaden student perspectives.
- Individualized extension is made possible through such activities as a natural follow-up to direct instruction. Students are in a position to pursue content on their own, following in some measure their personal predilections, needs, and interests.
- Present-day models of explicit instruction incorporate practice phases that follow the presentation of content for the purpose of reinforcing it (e.g., Rosenshine, 1986). Such practice could certainly incorporate literacy activities, which seem ideally suited to these models.
- Students who have received opportunities to become content literate will be better able to use content literacy as a means of extending their knowledge of a discipline even after they have completed a given course.

Disciplinary Literacy

Recently, a useful discussion of content literacy has taken place among reading researchers. This discussion has centered on the way experts in a given discipline read the texts they encounter. Some clear differences are evident. The strategies an expert needs to construct meaning from social studies texts differ from those needed to comprehend texts in mathematics or science. Many skills and strategies are the same, to be sure, and these general proficiencies are represented by the lowest level of the pyramid in Figure 1.1. Experts require more than general proficiency, however. They must be able to relate what they read to what they already know (their prior knowledge), which is represented by the middle level of the pyramid. In addition, they must have a command of specialized strategies, represented by the top level. The discussion of disciplinary literacy has focused on this level. How do experts read the texts in their disciplines strategically? Mathematicians are confronted with word problems, graphs, and equations embedded in text. Historians must be able to read primary source documents that may contain archaic language and arcane references. Scientists find it necessary to examine formulas and expressions with care and to objectively weigh claims made on the basis of findings. Literary scholars must apply conventions used by writers, such as those used in stagecraft, to interpret works of literature.

Figures 1.2 to 1.5 present four examples of texts commonly assigned in high school classrooms. Let’s consider how experts apply their content literacy ability to read each one. The first is an excerpt from *Federalist* No. 10, by James Madison. This is a primary source, and although it has been frequently summarized and discussed in secondary sources (such as textbooks), historians must be able to comprehend the original prose. By today’s standards, we are likely to find Madison’s writing a bit verbose and flowery, marked by complex sentence structures—qualities of most eighteenth-century writing. The historian must soldier through, however, and not be content with what others have to say about the essay.

FIGURE 1.2

Beginning of *Federalist* No. 10, by James Madison**To the People of the State of New York:**

AMONG the numerous advantages promised by a well constructed Union, none deserves to be more accurately developed than its tendency to break and control the violence of faction. The friend of popular governments never finds himself so much alarmed for their character and fate, as when he contemplates their propensity to this dangerous vice. He will not fail, therefore, to set a due value on any plan which, without violating the principles to which he is attached, provides a proper cure for it. The instability, injustice, and confusion introduced into the public councils, have, in truth, been the mortal diseases under which popular governments have everywhere perished; as they continue to be the favorite and fruitful topics from which the adversaries to liberty derive their most specious declamations. The valuable improvements made by the American constitutions on the popular models, both ancient and modern, cannot certainly be too much admired; but it would be an unwarrantable partiality, to contend that they have as effectually obviated the danger on this side, as was wished and expected. Complaints are everywhere heard from our most considerate and virtuous citizens, equally the friends of public and private faith, and of public and personal liberty, that our governments are too unstable, that the public good is disregarded in the conflicts of rival parties, and that measures are too often decided, not according to the rules of justice and the rights of the minor party, but by the superior force of an interested and overbearing majority. However anxiously we may wish that these complaints had no foundation, the evidence, of known facts will not permit us to deny that they are in some degree true. It will be found, indeed, on a candid review of our situation, that some of the distresses under which we labor have been erroneously charged on the operation of our governments; but it will be found, at the same time, that other causes will not alone account for many of our heaviest misfortunes; and, particularly, for that prevailing and increasing distrust of public engagements, and alarm for private rights, which are echoed from one end of the continent to the other. These must be chiefly, if not wholly, effects of the unsteadiness and injustice with which a factious spirit has tainted our public administrations.

By a faction, I understand a number of citizens, whether amounting to a majority or a minority of the whole, who are united and actuated by some common impulse of passion, or of interest, adverse to the rights of other citizens, or to the permanent and aggregate interests of the community.

There are two methods of curing the mischiefs of faction: the one, by removing its causes; the other, by controlling its effects.

There are again two methods of removing the causes of faction: the one, by destroying the liberty which is essential to its existence; the other, by giving to every citizen the same opinions, the same passions, and the same interests.

It could never be more truly said than of the first remedy, that it was worse than the disease. Liberty is to faction what air is to fire, an aliment without which it instantly expires. But it could not be less folly to abolish liberty, which is essential to political life, because it nourishes faction, than it would be to wish the annihilation of air, which is essential to animal life, because it imparts to fire its destructive agency.

The second expedient is as impracticable as the first would be unwise. As long as the reason of man continues fallible, and he is at liberty to exercise it, different opinions will be formed. As long as the connection subsists between his reason and his self-love, his opinions and his passions will have a reciprocal influence on each other; and the former will be objects to which the latter will attach themselves. The diversity in the faculties of men, from which the rights of property originate, is not less an insuperable obstacle to a uniformity of interests. The protection of these faculties is the first object of government. From the protection of different and unequal faculties of acquiring property, the possession of different degrees and kinds of property immediately results; and from the influence of these on the sentiments and views of the respective proprietors, ensues a division of the society into different interests and parties.

The second example is a discussion of the solar system, written for the NASA Web site (see Figure 1.3). Although intended for a general audience, this text would be read differently by planetary scientists. They will judge the statements of fact against their own prior knowledge and then decide whether to accept them. For example, they may know whether “final approval” has been given to the 23 candidate moons. They will also be able to identify important omissions, if

FIGURE 1.3**Our solar system, from the NASA Web site**

From our small world we have gazed upon the cosmic ocean for thousands of years. Ancient astronomers observed points of light that appeared to move among the stars. They called these objects planets, meaning wanderers, and named them after Roman deities – Jupiter, king of the gods; Mars, the god of war; Mercury, messenger of the gods; Venus, the goddess of love and beauty; and Saturn, father of Jupiter and god of agriculture. The stargazers also observed comets with sparkling tails, and meteors – or shooting stars apparently falling from the sky.

Since the invention of the telescope, three more planets have been discovered in our solar system: Uranus (1781), Neptune (1846) and Pluto (1930). Pluto was reclassified as a dwarf planet in 2006. In addition, our solar system is populated by thousands of small bodies such as asteroids and comets. Most of the asteroids orbit in a region between the orbits of Mars and Jupiter, while the home of comets lies far beyond the orbit of Pluto, in the Oort Cloud.

The four planets closest to the sun – Mercury, Venus, Earth, and Mars – are called the terrestrial planets because they have solid rocky surfaces. The four large planets beyond the orbit of Mars – Jupiter, Saturn, Uranus, and Neptune – are called gas giants. Beyond Neptune, on the edge of the Kuiper Belt, tiny, distant, dwarf planet Pluto has a solid but icier surface than the terrestrial planets.

Nearly every planet – and some moons – has an atmosphere. Earth's atmosphere is primarily nitrogen and oxygen. Venus has a thick atmosphere of carbon dioxide, with traces of poisonous gases such as sulfur dioxide. Mars' carbon dioxide atmosphere is extremely thin. Jupiter, Saturn, Uranus, and Neptune are primarily hydrogen and helium. When Pluto is near the sun, it has a thin atmosphere, but when Pluto travels to the outer regions of its orbit, the atmosphere freezes and collapses to the planet's surface. In that way, Pluto acts like a comet.

There are 146 known natural satellites (also called moons) in orbit around the planets in our solar system, ranging from bodies larger than our own Moon to small pieces of debris. Many of these were discovered by planetary spacecraft. Currently, another 23 moons are awaiting final approval before being added to our solar system's moon count. Some moons have atmospheres (Saturn's Titan); some even have magnetic fields (Jupiter's Ganymede). Jupiter's moon Io is the most volcanically active body in the solar system. An ocean may lie beneath the frozen crust of Jupiter's moon Europa, while images of Jupiter's moon Ganymede show historical motion of icy crustal plates. Some moons may actually be asteroids that were captured by a planet's gravity. The captured asteroids presently counted as moons may include Mars' Phobos and Deimos, several satellites of Jupiter, Saturn's Phoebe, many of Uranus' new satellites, and possibly Neptune's Nereid.

From 1610 to 1977, Saturn was thought to be the only planet with rings. We now know that Jupiter, Uranus and Neptune also have ring systems, although Saturn's is by far the largest. Particles in these ring systems range in size from dust to boulders to house sized, and may be rocky and/or icy.

Most of the planets also have magnetic fields which extend into space and form a magnetosphere around each planet. These magnetospheres rotate with the planet, sweeping charged particles with them. The sun has a magnetic field, the heliosphere, which envelops our entire solar system.

Ancient astronomers believed that the Earth was the center of the Universe, and that the sun and all the other stars revolved around the Earth. Copernicus proved that Earth and the other planets in our solar system orbit our sun. Little by little, we are charting the Universe, and an obvious question arises: Are there other planets where life might exist? Only recently have astronomers had the tools to indirectly detect large planets around other stars in nearby solar systems.

Source: <http://solarsystem.nasa.gov/planets/profile.cfm?Object=SolarSys&Display=OverviewLong>

any, and they will continuously reference their technical vocabulary for the meanings of terms like *sulphur dioxide* and *magnetosphere*.

The third example (Figure 1.4) is a sample of the text commonly encountered in beginning algebra textbooks. It illustrates a number of conventions that are well understood by mathematicians but that might pose challenges for less-expert students. For example, a mathematician would have mastered various symbols used in mathematical expressions, such as parentheses to denote the multiplication of sums and differences, and would realize that expressions and

FIGURE 1.4

Sample text common in beginning algebra

Using Multiple Approaches to Factor Polynomials

We have now examined three basic approaches to factoring. Because more than one of these approaches can be used with many polynomials, it is important to have a clear idea about which approach to try first. Our combined strategy involves trying the approaches in this order.

Step 1. Check for a common factor.

Step 2. Look for the difference of two squares.

or

Factor a trinomial into two binomials.

Let's apply this strategy to two examples. The three terms in expression (1) contain a common factor, $2x$.

$$(1) \quad 2x^3 - 6x^2 - 20x$$

Our strategy begins by removing the common factor. When we do so, we obtain:

$$(2) \quad 2x(x^2 - 3x - 10)$$

We can now further factor the second part of expression (2) into two binomials:

$$(3) \quad 2x(x - 5)(x + 2)$$

The next example has only two terms, and they contain a common factor.

$$(4) \quad 5x^{14} - 125x^8$$

After we remove the common factor from expression (4), what's left is the difference of two squares.

$$(5) \quad 5x^8(x^6 - 25)$$

We complete our factoring by applying the rule for the difference of two squares:

$$(6) \quad 5x^8(x^3 - 5)(x^3 + 5).$$

equations are often numbered for ease of reference. Like scientists, math experts must also access their knowledge of technical vocabulary because many of the terms they encounter (e.g., *binomial* and *polynomial*) are specific to mathematics. Some technical terms have a meaning specific to mathematics and nonmathematical meanings as well (e.g., *factor* and *square*). The expert will realize this and consistently select the appropriate meaning from context.

Finally, examine the excerpt from Shakespeare's *Romeo and Juliet* in Figure 1.5, long a part of the literary canon read by high school students. Think about how an expert scholar would read this excerpt differently from the way a novice might read it. To begin with, the expert would understand the use of blank verse to frame the dialogue and the presence of minimal stage directions. Prior knowledge about the times and Elizabethan expressions are similar to what historians interested in this period would require. Specialized vocabulary would be useful as well, such as the Latin term *exeunt* (plural of *exit*) to direct all characters to leave the stage. The scholar would also be aware of a range of literary devices at work, such as personification, imagery, foreshadowing, and others.

Our definition of content literacy certainly includes specialized skills and strategies as requirements that are unique to particular disciplines. In other words, disciplinary literacy is essentially the same as content literacy. Two questions arise concerning how students in middle and high school can acquire these proficiencies. The first is how specialized our students truly need to become. There can be no disputing that content-specific strategies are applied by experts in each field (Moje, 2008; Shanahan & Shanahan, 2008). But exactly how "expert" should we expect our students to be? Heller (2010) argues for a level of advanced "amateurism," a status where students have begun to read like experts but are not fully expert themselves. He argues that, although there are indeed differences in the literacy strategies used by experts in different disciplines, the principal goal of middle and high school teachers, with the possible exception of those involved in Advanced Placement classes, should be more general. The goal is not to make

FIGURE 1.5**Excerpt from a Shakespearean play****ROMEO**

Peace, peace, Mercutio, peace!
Thou talk'st of nothing.

MERCUTIO

True, I talk of dreams,
Which are the children of an idle brain,
Begot of nothing but vain fantasy,
Which is as thin of substance as the air
And more inconstant than the wind, who woos
Even now the frozen bosom of the north,
And, being anger'd, puffs away from thence,
Turning his face to the dew-dropping south.

BENVOLIO

This wind, you talk of, blows us from ourselves;
Supper is done, and we shall come too late.

ROMEO

I fear, too early: for my mind misgives
Some consequence yet hanging in the stars
Shall bitterly begin his fearful date
With this night's revels and expire the term
Of a despised life closed in my breast
By some vile forfeit of untimely death.
But He, that hath the steerage of my course,
Direct my sail! On, lusty gentlemen.

BENVOLIO

Strike, drum.
Exeunt

Romeo and Juliet, Act 1, Scene 4

students experts but competent “amateurs.” We agree with Heller and see content literacy as relative to the demands of grades 6 to 12.

The second question is, Who should be responsible for developing the “expert” strategies students will need to read content area texts? Language arts teachers have an interest in literacy, to be sure, but they also have the responsibility for teaching literature, which, as we have seen, has its own set of expert competencies. Language arts teachers typically lack the knowledge of which skills pertain to other disciplines. Our belief is that content-specific skills and strategies are best addressed by content area teachers. These instructors have the knowledge of which strategies are important, they can show students how to apply them quickly and in authentic contexts, and they are always in the right place at the right time (Fang & Schleppegrell, 2010).

This charge is not as daunting as it may sound. A great deal of “reading” instruction can be delivered on the fly as opportunities arise. The key is to examine your own area and the kind of reading you expect students to do. As Heller and Greenleaf (2007) have stated, “[A]ll content area teachers should know what is distinct about the reading, writing, and reasoning processes that go on in their discipline; they should give students frequent opportunities to read, write, and think in these ways; and they should explain how those conventions, formats, styles, and modes of communication differ from those that students might encounter elsewhere in school” (p. 27).

Teacher Resistance to Content Literacy

Even though research has shown the effectiveness of many content area teaching techniques that involve reading (Alvermann & Phelps, 2004; Harvey & Goudvis, 2007; Vacca & Vacca, 2004) and writing (Thorp, 2002; Walley & Kommer, 2000), teachers of content area subjects frequently do not employ them. In a national survey, for example, Irvin and Connors (1989) found that no more than 14 percent of the respondents employed such techniques as an important part of their programs. In an observational study of middle and high school social studies teachers, Ness (2007) found almost no evidence that such strategies were used. If content-literacy strategies are effective at increasing content learning, why do teachers resist their use? Stewart and O'Brien (1989) have observed that teachers offer numerous answers to this question, though three reasons stand out.

First, many teachers feel inadequate to handle reading problems in their classrooms. Certainly students who are experiencing severe reading difficulties present special problems that may exceed the expertise of most subject matter specialists. These individuals are relatively few in number, however, and strategies for meeting their needs are readily available and will be discussed at various points throughout this text. Content-literacy strategies are designed to assist all students, the poorest readers included, by facilitating their use of text during reading and by extending and organizing their thinking through writing (e.g., Prentice & Cousin, 1993). The techniques involved are remarkably simple. No specialized training in teaching the skills of word recognition and comprehension is needed.

Second, teachers often feel that literacy activities infringe on subject matter time. We are not in any way suggesting that a portion of the daily instructional time in content classes be set aside for general reading development. The literacy activities recommended in this book require no "time-out" from content instruction. Instead they involve rearranging (rather than shortening) discussion time and merging reading and writing with content acquisition. It is important to remember that the point of the strategies discussed in this book is to increase content learning, not to improve reading and writing ability (though this may follow as a by-product).

Last, many teachers deny the need for content area reading and writing techniques. As we have mentioned, some have eliminated this need by reducing the literacy requirements of their courses, creating an atmosphere in which writing and reading have no place. Alger (2009) refers to these instructional dodges as workarounds. While literacy may not be a liability in such classrooms, neither will it be an asset. Other teachers find that the majority of their students are capable of mastering the material assigned when they apply themselves. While this may be true as far as it goes, there are three problems with such a view: (1) It wastes students' time as they struggle unnecessarily with difficult material, (2) it dampens their attitude toward the subject matter, and (3) it results in inferior comprehension, even though they have "read" the material.

To these objections, Ness (2007) adds a fourth. Her interviews with science and social studies teachers in middle and high schools revealed that high-stakes testing is frequently cited as a reason for avoiding content literacy strategies. This objection is similar to the second of O'Brien's: There's just not enough time. By blaming high-stakes testing, however, teachers may be attempting to shift the responsibility to policy makers. Ironically, high-stakes tests always require some level of content literacy. We argue that by incorporating reading and writing tasks into their instruction, content area teachers can take a major step toward truly preparing their students for the assessments they must take.

Content Literacy and the Common Core Standards

An important development has implications for teachers in content area subjects. The release of the Common Core Standards for English and math in 2010 and their rapid adoption by the vast majority of states will inevitably lead to teacher evaluation based on students' attainment of those standards. Especially relevant are the standards for comprehending informational text in grades 6 to 12. We present those standards in Figure 1.6. They deserve close examination, for content specialists in all areas may soon find themselves charged with finding ways to attain them. (Note that an example given for Standard 4 at grade 12 is *Federalist* 10.)

The Common Core Standards were developed by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO). The goal was to avoid differences from one state to another and at the same time to raise the level

FIGURE 1.6

Common Core Reading Standards for Informational Text in Grades 6-12*

	Grade 6	Grade 7	Grade 8	Grade 9-10	Grade 11-12
Key Ideas and Details					
1	Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
2	Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.	Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.	Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.	Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.
3	Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).	Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).	Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).	Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.	Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.
Craft and Structure					
4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines <i>faction</i> in <i>Federalist</i> No. 10).

(continued)

FIGURE 1.6 (continued)**Common Core Reading Standards for Informational Text in Grades 6-12**

	Grade 6	Grade 7	Grade 8	Grade 9-10	Grade 11-12
5	Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.	Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.	Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).	Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.
6	Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.	Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.	Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.	Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.	Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.
Integration of Knowledge and Ideas					
7	Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.	Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).	Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.	Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.	Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.
8	Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.	Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.	Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., <i>The Federalist</i> , presidential addresses).

FIGURE 1.6 (continued)

Common Core Reading Standards for Informational Text in Grades 6-12

	Grade 6	Grade 7	Grade 8	Grade 9-10	Grade 11-12
9	Compare and contrast one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).	Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.	Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.	Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.	Analyze seventeenth-, eighteenth-, and nineteenth century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.
Range of Reading and Level of Text Complexity					
10	By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.	By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.	By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.	By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9–10 text complexity band independently and proficiently.	By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.

CCR refers to College and Career Readiness.

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of expectations for students at all grade levels. At this writing, standards for science and social studies have not been released.

Seeing Yourself as a Teacher

Teaching is possibly the only profession with which newcomers are very familiar before they are trained. You may never have taught, but you have watched others do so for literally thousands of hours. In your many experiences as a student, you have had a chance to evaluate numerous teaching practices, primarily in terms of the effects they may have had on your own learning.

Now, as you are introduced to teaching methods that you may not have experienced as a student, it will probably seem natural to think back to your own days as a student in middle- and secondary-level classrooms. Diane Holt-Reynolds (1991, 1992) and more recently Conley (2008) found that preservice teachers tend to evaluate the usefulness of a new method by imagining themselves as a student in a class where the method is practiced. They then attempt to project how they might have reacted to the method. If they suspect that their experience would not have been a productive one, they reject the new method as unsuitable to their future instructional

Teachers, who educate children, deserve more honor than parents, who merely gave them birth; for the latter provide mere life, while the former ensure a good life.

ARISTOTLE

practice. In other words, undergraduates tend to make a distinction between self-as-teacher and self-as-student. Because they lack actual classroom experience on which to base their judgments, any proposed new method is put to the only test available to them: their experience as students. The result is a kind of dialogue between *self-as-teacher* and *self-as-student*.

Holt-Reynolds (1991) describes the process this way:

Almost simultaneously switching roles, they imagined participating in the activity themselves as a student. If Self-As-Student reacted to the imaginary scenario in ways that Self-As-Teacher has already decided are valuable, then these preservice teachers report making favorable decisions about that activity. If, however, Self-As-Student reacted in ways that Self-As-Teacher already sees as undesirable, the preservice teacher made a negative decision. (n.p.)

A difficulty with this very natural process is that preservice teachers' observations of the teachers they themselves have had (numerous as the observations were) have revealed little about how those teachers thought and planned. Nor does this process account for the variety of students a teacher is likely to encounter in a typical classroom. Moreover, it relies on vague and distant impressions made long ago and fails to provide any basis for comparing the methods actually experienced with those a teacher *might* have used but did not.

Our wish is to make you aware, at this early point, of the tendency to use your own background in classrooms (self-as-student) to judge the worth of instructional techniques to your teaching (to self-as-teacher). We hope that by becoming aware of the process and its limitations, you can defer final judgment until you try a technique for yourself and witness its actual effects on your own students (see Figure 1.7).

NET Worth

Adlit.Org

AdLit.org is both the name of the site and all the URL you need. The site contains information about instructional strategies, research, news, and much more. There are videos and webcasts on many of the topics related to adolescent literacy. The "Ask the Experts" link offers the chance to submit questions to a team of teachers and researchers. This nonprofit resource was developed by WETA, a public television and radio station near Washington, DC. It is funded jointly by the Carnegie Corporation of New York and the Ann B. and Thomas L. Friedman Family Foundation.

NET Worth

Literacy-Related Organizations

International Reading Association. Provides information about literacy publications, conferences, and projects.

www.reading.org

National Council of Teachers of English (NCTE). Site contains ideas for teaching English, literacy, and language arts for P–16 teachers. Also contains information on books and journals and NCTE news.

www.ncte.org

American Library Association. Contains links to many author sites and book awards.

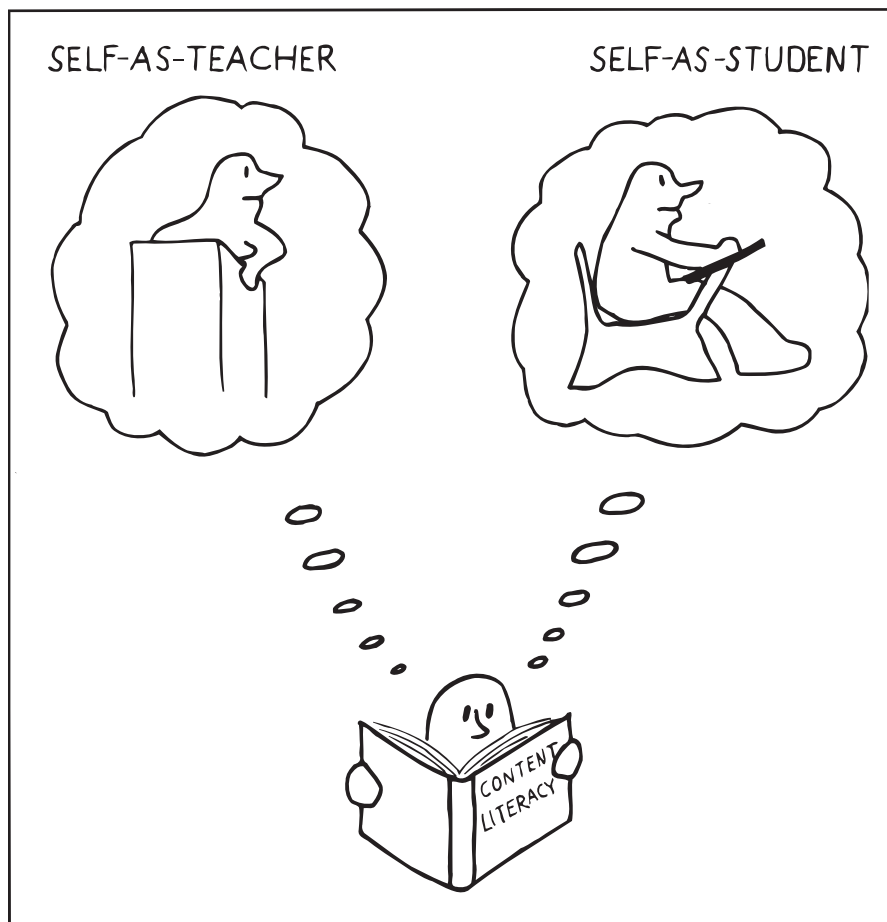
www.ala.org

Children's Book Council (CBC). The CBC site contains links for teachers, parents, and authors in their quest to encourage children to read.

www.cbcbooks.org

FIGURE 1.7

Seeing yourself as a teacher

**NET Worth****Educational Research at Your Fingertips**

Do you have a question about education that research can answer? These sites can help.

ERIC Database. Housed at the U.S. Department of Education.

www.eric.ed.gov

ERIC Digests. Extensive ERIC digest system providing nutshell research summaries on many topics. Also housed at the U.S. Department of Education.

www.ericdigests.org

Research Reports from the National Research and Development Centers. Makes available hundreds of reports from the twelve federal research and development centers. Reports are in full text and/or PDF format.

research.cse.ucla.edu

Google Scholar allows you to search for articles from multiple databases by typing in key words.

scholar.google.com

NET Worth

Common Core Standards

Examine all of the English and math standards and keep up with which states have adopted them. You will also find background about their development and links to related resources.

www.corestandards.org

We close this chapter with a request and a challenge. If you are skeptical about the potential of literacy activities to improve learning in your classes, we ask that you keep an open mind as you read on and that you carefully consider our previous discussion of how content area teachers often rationalize their way out of literacy activities. Should you still be skeptical at the conclusion of the course, we challenge you to give the techniques presented a fair trial in the classroom. Conduct an action research study in which comparable classes are exposed to the same unit with and without the use of literacy activities. Use your own unit test, or some similar performance measure, as the yardstick by which you compare the classes. We're confident your own evidence will satisfy your doubts.

SUMMARY

Literacy is a concept that has changed considerably over the years. A recent insight has been that the question of whether an individual is literate is relative to the demands of the individual's environment (classroom, workplace, society, etc.). To some extent, classroom teachers control whether students are literate through the assignments they make.

Four aspects of literacy are important. Emergent literacy is the developing ability among young children to read and write. Functional literacy is the ability to function within one's environment insofar as reading and writing are concerned. While this concept was once limited to "public" tasks, such as reading signs and completing forms, it now embraces the demands of the workplace as well. Workplace literacy is therefore a part of functional literacy—the part that concerns an individual's ability to use reading and writing successfully on the job.

Content literacy is the ability to use reading and writing to acquire new content within a given subject area. It requires general literacy skills, skills related to reading and writing in the specific area of study, and existing content knowledge within that area. Our perspective is that disciplinary literacy, which includes the skills and strategies used by experts in a field, is consistent with our notion of content literacy.

This definition of content literacy has important implications for teachers. It suggests that knowing content is not the same as being able to read and write about it. Instead, content knowledge is one requirement of content literacy. This means that by teaching content, teachers automatically make students more content literate simply by adding to their knowledge base. It also means that content literacy is not a general skill because specific knowledge within the area of study is needed. The content literate student is one who can add new knowledge through reading, and refine and reorganize that knowledge through writing. These processes are not limited to certain subjects; they pertain to all areas. Because learning content is the only relevant goal of literacy activities, teachers do not have to be concerned with the fine points of teaching writing. Rather, by establishing reasonable literacy demands, teachers can extend students' understanding of new materials without presenting tasks that are beyond their abilities.

Even though the methods for using and developing content literacy have an extensive research base, teachers have often resisted using them. They have argued that they lack the training to contend with students who have special needs, that literacy activities infringe on time needed to teach content, that such activities are not really needed to teach content, and that, in any event, preparing students for high-stakes tests trumps the use of these instructional activities. The idea of content literacy and its implications refute these arguments. Literacy activities within

content area classrooms tend to maximize and reinforce learning when they are appropriately matched to student abilities. Adoption of the Common Core Standards may soon provide an extra impetus for the use of such activities.

Getting Involved

1. A colleague tells you that she plans to revise her science course so that reading and writing are not required except for objective tests. She will rely on lecture, demonstrations, and discussion to convey content. She estimates impressive savings for the district in textbook purchases, and she looks forward to fewer papers to grade and no interference with instruction caused by reading problems. Do you think her plan is likely to result in acceptable learning? Would you support her in her efforts? Suppose the idea began to catch on among teachers in other content areas. Would you support a district policy that severely limits reading and writing in all subjects but language arts? Defend your position.
2. In the 1985 movie *Teachers*, starring Nick Nolte, a social studies instructor made the following complaint to a colleague in the lounge:

“I signed a contract to teach social studies, not reading. I don’t see why I should have to spend my time dealing with students who can’t read the text. I’m a history teacher, not a reading teacher.”

Her friend looked at her thoughtfully. “But you are a teacher, aren’t you?” he asked.

The woman had nothing to say. How would you have responded? Does being a teacher imply a duty to do whatever may be needed to ensure learning?
3. Analyze the Common Core Standards presented in Figure 1.6. Begin by studying the range of competencies included. Then look for their progression across grades. Do you feel the standards are too ambitious for many students? In your opinion, can day-to-day instruction in your content area be planned to address some or all of the standards? What competencies would you add, delete, or change?

Books are the carriers of civilization. Without books, history is silent, literature dumb, science crippled, thought at a standstill.

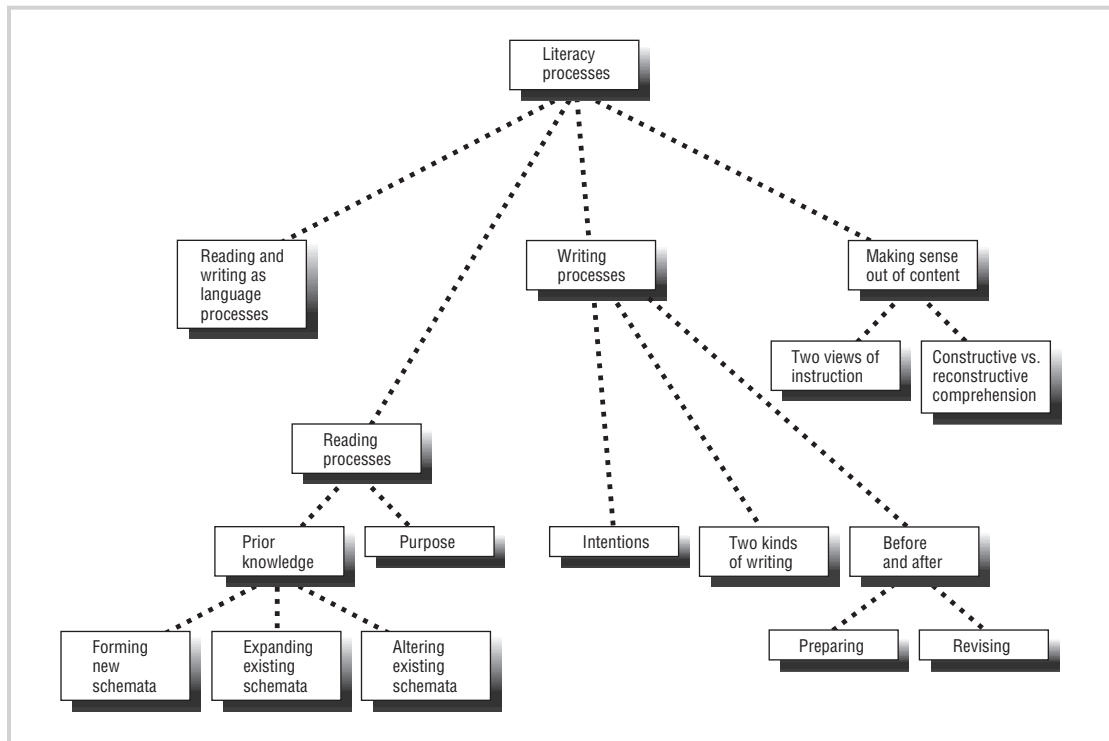
BARBARA
TUCHMAN



Go to the Topic <insert topic name> in the MyEducationLab (www.myeducationlab.com) for your course, where you can:

- Find learning outcomes for <insert topic name> along with the national standards that connect to these outcomes.
- Complete Assignments and Activities that can help you more deeply understand the chapter content.
- Apply and practice your understanding of the core teaching skills identified in the chapter with the Building Teaching Skills and Dispositions learning units.
- Examine challenging situations and cases presented in the IRIS Center Resources.
- Check your comprehension on the content covered in the chapter by going to the Study Plan in the Book Resources for your text. Here you will be able to take a chapter quiz, receive feedback on your answers, and then access Review, Practice, and Enrichment activities to enhance your understanding of chapter content. (optional)
- Visit **A+RISE**. A+RISE® Standards2Strategy™ is an innovative and interactive online resource that offers new teachers in grades K–12 just-in-time, research-based instructional strategies that meet the linguistic needs of ELLs as they learn content, differentiate instruction for all grades and abilities, and are aligned to Common Core Elementary Language Arts standards (for the literacy strategies) and to English language proficiency standards in WIDA, Texas, California, and Florida.

Literacy Processes



There is in writing the constant joy of sudden discovery, happy accident.

—H. L. Mencken

It is probably natural to think of reading and writing as two vastly different processes, linked only by a mutual dependence on printed language. Yet we now know that writing and reading share numerous similarities. For the purposes of this text, the most important of these common traits is the potential of each process to enhance learning. To better understand this potential, it is necessary to appreciate in general terms how the two processes work.

Objectives

After reading this chapter you should be able to

1. relate reading and writing to their oral language counterparts;
2. describe the sequence of key events in the process of written communication;
3. explain the role and purpose of prior knowledge in reading and the role of intention in writing; and
4. list important similarities shared by reading and writing, and explain their implications for content instruction.

Reading and Writing as Language Processes

Imagine a world without language. To convey even the simplest thoughts would require the use of gestures, facial expressions, drawings, physical objects, and other contrivances. Even then, precise communication would seldom be assured, while expressing—or even thinking about—abstract ideas would be extremely difficult. Assume, for example, that as a cave dweller in pre-linguistic antiquity, you happen to shatter a stone chisel while working. In examining the broken fragments, it might occur to you that each fragment could be broken in turn into still smaller fragments, and so on. You wonder if there is some limit beyond which the fragments cannot, under any circumstances, be further subdivided. How would you communicate this thought to a friend? You could show your friend the pieces and break one of them a second time, gesticulating and pantomiming and perhaps painting wordless diagrams on the wall of your cave, but these efforts would in no way guarantee that you would be understood.

If you had developed a collection of spoken sounds to symbolize concepts and a system of rules for combining those sounds as a means of expressing ideas, your task would be much simpler. These acoustic symbols are, of course, *words*, while the set of all available spoken words is called the *lexicon*. The rules for combining words are together referred to as *grammar*, or *syntax*. Thus, the lexicon and syntax are the two primary components of any language.

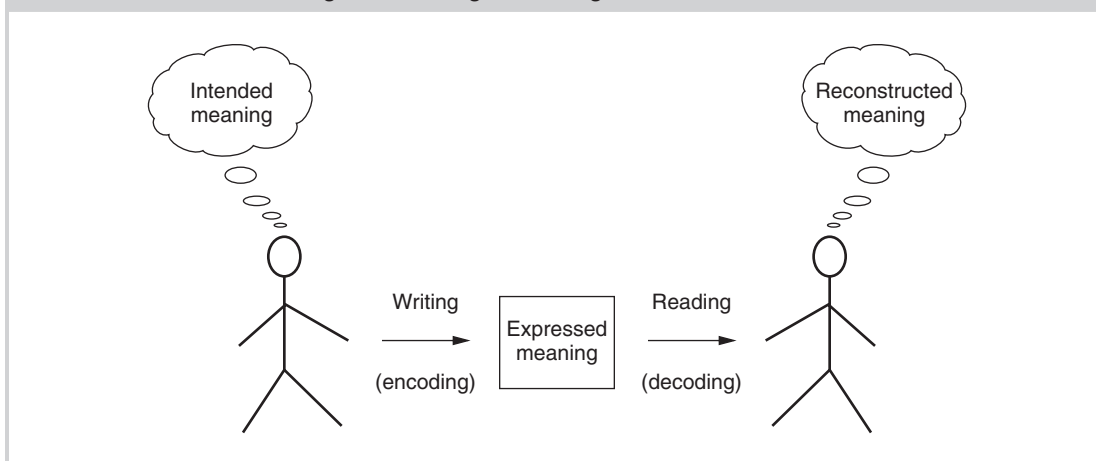
So far we have been discussing oral language. Consider now a second set of symbols, this time visual, designed to represent spoken words. These visual symbols (written words) can be combined largely according to the grammatical rules governing oral language, though written communication has nuances all its own. Historically, two principal methods have been used to represent spoken words with visual symbols. One method is to use letters to symbolize the smallest, most basic speech sounds, called *phonemes*. The advantages of this approach are that the letters are interchangeable and that relatively few are needed to depict almost all words. Written languages formulated through this method are described as *alphabetic*. These include most Western languages, including English. Certain other languages, such as Chinese, employ an *ideographic* method, in which a unique symbol is used to represent an entire word. While in some cases complex ideographs can be constructed from simpler forms, component speech sounds are not symbolically represented. Thus, thousands of individual symbols must be learned by the language user. Because there is little relationship between print and sound, the same visual word may have entirely different pronunciations in two localities. Thus, speakers of the Mandarin and Cantonese dialects of Chinese cannot converse with one another even though they read and write the same language!

Whatever the method of visually symbolizing spoken language, the result is a second system of symbols (written ones) superimposed on the first. Reading and writing are therefore the more recent counterparts of the much older processes of speaking and listening (Carmichael et al., 2010; Chen, Chen, & Sun, 2010; Gomez, 2010).

Because communication involves the transmission of ideas and feelings from one individual to another, a complete model of the process, as it relates to literacy, must begin in the mind of the writer and end in that of the reader. As Figure 2.1 shows, this process starts with the thoughts a writer may wish to convey. These intentions tend to be somewhat fluid and independent of language until they are given linguistic form. This process, whether oral or written, is sometimes

FIGURE 2.1

Transformations of meaning from writing to reading



described as *encoding* because the language itself is made up of arbitrary, cipherlike symbols that differ from one language to the next. Because the reader cannot directly access the writer's thoughts, the written product must be used in an effort to reconstruct those thoughts. The success of this effort depends on the reader's ability to *decode* the printed symbols. The degree to which the ideas the writer initially intended to convey were eventually reconstructed in the reader's mind is the degree to which communication was successful.

It is important to make clear that this model sidesteps some of the other reasons an individual might choose to write: to evoke an emotion in the reader, to persuade or move the reader to action, to mislead or distract the reader, and so on (see Smith [2004], for a discussion). The purpose of informing the reader is, however, the chief reason writers write in content subjects and the chief reason their writing is assigned to students. Depicting the reading and writing processes, from an information-processing perspective, is therefore well suited to the topics we will explore in the coming chapters.

The Reading Process

What happens when we read? This “simple” question has intrigued researchers for decades and has yet to be satisfactorily answered. A good starting point is to note that fluent, mature reading is the last of several stages through which children pass as their ability develops. Several researchers have studied these stages in detail (e.g. Chall, 1983, 1996; Ehri & Wilce, 1985; Freedman & Carver, 2007; Gallant & Schwartz, 2010; Hassett, 2010; Kucer & Tuten, 2003; Perfetti, 2003; Stanovich, 2000). Figure 2.2 summarizes the five stages identified by Chall. Even though our primary concern is with the third stage—Reading for Learning—it is important to recognize that children reach this stage only after successfully traversing the two stages that come before. A student with significant decoding problems, for example, will have grave difficulties with content

FIGURE 2.2

Chall's stages of reading development

Approximate grades and ages

Stage 1	Initial Reading or Decoding	1–2	6–7 years
Stage 2	Confirmation, Fluency	2–3	7–8 years
Stage 3	Reading for Learning	4–8	9–14 years
Stage 4	Multiple Viewpoints	9–12	14–18 years
Stage 5	Construction, Reconstruction: A World View	College	19+ years

area reading assignments. Unfortunately, mismatches of this sort are not uncommon, and from time to time we will suggest strategies for accommodating the needs of such students.

Let's return now to the mature reading process. For our purposes, we will not be concerned with a detailed description of the subprocesses that underlie reading. We can, however, offer the following capsule description based on the conclusions that reading researchers have reached:

1. Reading is an interactive process in which a reader's prior knowledge of the subject and purpose for reading operate to influence what is learned from text.
2. The visual structure of printed words and the system by which letters represent the sounds of speech together define subprocesses used to identify words.
3. These word-identification processes are applied rapidly by fluent readers, but they may hamper readers with problems.
4. As visual word forms are associated with word meanings, a mental reconstruction of overall textual meaning is created. This reconstruction is subject to continual change and expansion as the reader progresses.
5. In the end, the nearer the reconstructed meaning is to the writer's originally intended meaning, the more successful the act of communication will be.
6. The reader's purpose may deliberately limit the scope of the reconstruction, however, as when one reads an article for its main points or consults an encyclopedia for a specific fact.

Based on this nutshell description of the process, we will define reading as *the reconstruction in the mind of meaning encoded in print*. From the perspective of the content teacher, two points are important to note. First, it is not the content specialist's role to *teach* the process we have outlined here but to facilitate students' attempts to use that process to learn through written materials. Second, the best way to achieve this facilitation is to focus on two factors in the reading process that are most easily influenced by the teacher who assigns the materials: (1) the prior knowledge of the students and (2) the purposes for which the students will read. In the chapters that follow, we will present many techniques for addressing these two factors. For now, let's examine the role each of these factors plays in the process of reading.

The Role of Prior Knowledge

Figure 2.3 presents a passage selected to demonstrate exactly how limiting prior knowledge can be when it is not adequate for making sense of new information. Read the passage now if you have not already done so. Did you become vaguely (perhaps openly) frustrated as you read? We suspect you may have, even though you knew it was part of a planned demonstration. Imagine the plight of your students when unplanned shortcomings in prior knowledge make the material they must read just as frustrating. Especially ironic is the fact that limitations in prior knowledge are often easily overcome if an instructor is aware that they exist and takes a few simple steps to address them. How much better your comprehension would have been a moment ago, for example, had we bothered to provide you in advance with the simple fact that the passage deals with a cricket match!

Let's look a little farther into how prior knowledge can wield such power over comprehension. It is helpful to think of the underlying knowledge needed to comprehend what we read as being stored in interconnected categories within memory. These categories are called *schemata* (plural of *schema*). Think of a schema as all you know about a given concept. You have a schema

*Knowledge is
the true organ of
sight, not the eyes.*

PANCHATANTRA
(fifth century)

FIGURE 2.3

An example of how limited prior knowledge can hinder comprehension

"I have not been bowling my first spell in the right areas. Hopefully, I will get this right in this game," remarked Edwards. Edwards has been good with the reverse swing he is managing with the older ball, and India's middle order, especially the young batsmen, have consistently struggled against him.

Source: *Times of India* online version, July 5, 2011.

for “contracts,” for example, that may differ considerably from the extensive schema for this same concept that exists in the mind of an attorney. In the same way, the schemata for “contracts” that individual students might bring to the reading of a business law chapter are likely to vary considerably from one student to the next.

Schemata are not stored in isolation but are connected by intricate networks of association (Arnold, 2010; Day, 2010; Gregory & Cahill, 2010; Rance-Roney, 2010; Salmani-Nodoushan, 2010; Todaro, Millis, & Dandotkar, 2010). As you read, various schemata are “activated,” and those portions of your prior knowledge are brought to bear on the task of bringing meaning to the print before you. Connections among schemata are also activated as you attempt to reconstruct the author’s expressed meaning.

Comprehending what we read is thus highly dependent on prior knowledge. As Pearson and Johnson (1978) put it, “*Comprehension is building bridges between the new and the known*” (p. 24, emphasis in original). As Gunning (2007) described it more recently, “Comprehension is a constructive, interactive process involving three factors—the reader, the text, and the context in which the text is read” (p. 266).

When a student’s existing knowledge of the content to be covered by a reading assignment is scant, comprehension is poor. Accordingly, some of the techniques we shall introduce involve building background knowledge before students begin to read. This effort entails a rearrangement of discussion time and takes nothing from the presentation of content. Rather, it is merely an alternative way of introducing the content, and it pays tangible dividends in student understanding.

As the reader progresses through print, schemata for the concepts discussed by the writer will be changed in one or more of three basic ways. New schemata may be formed, or existing schemata may be expanded or fundamentally altered.

Formation of New Schemata. The introduction of new concepts is a frequent occurrence in content learning and calls for the establishment of new schemata. This involves forming associations with existing schemata so that the new knowledge is meaningfully linked to the old.

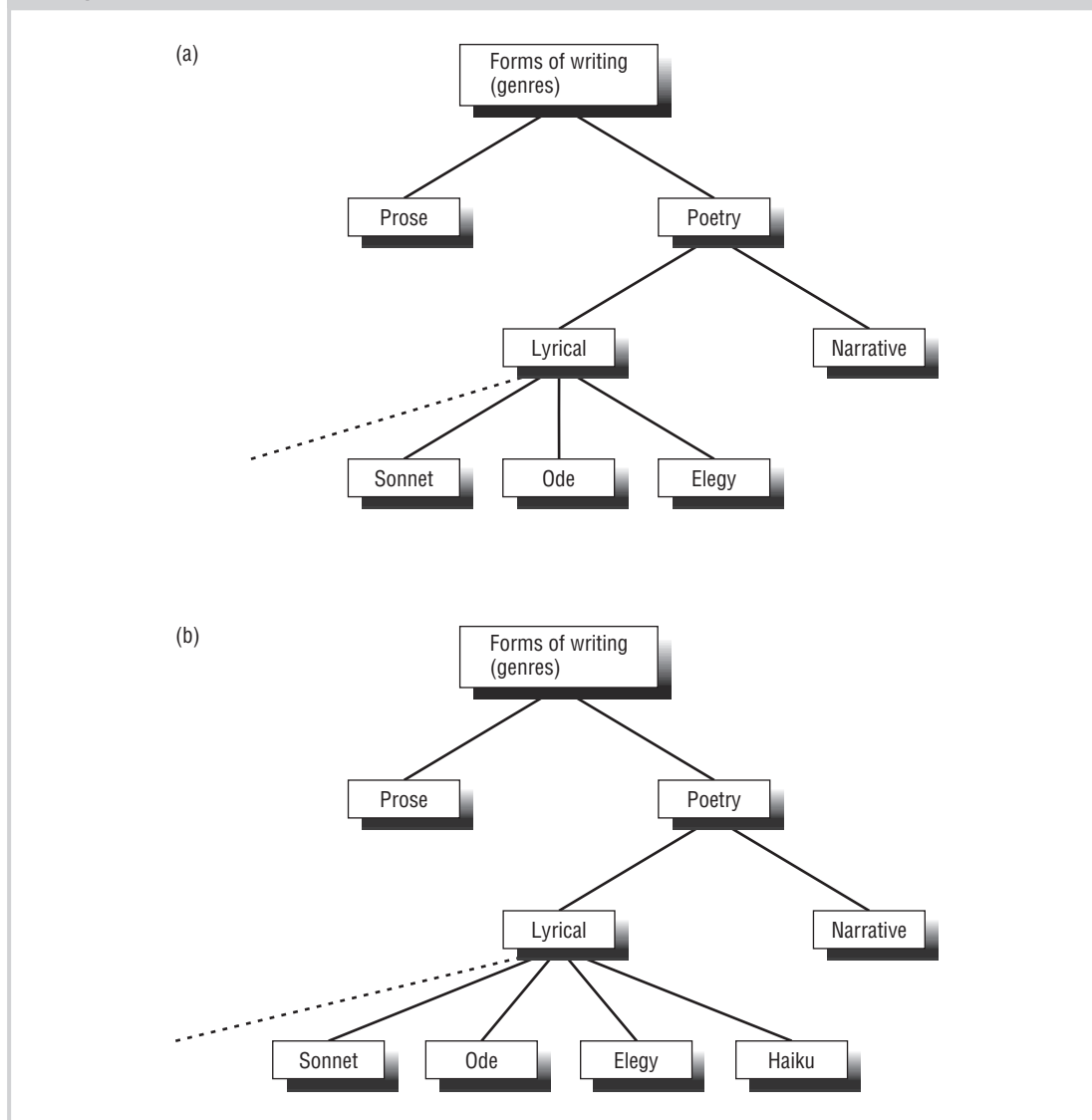
Consider the language arts student who has just read a selection on haiku, complete with definition, examples, writing guidelines, and so on. Let us assume that the reading serves to introduce the concept of haiku for the first time. The student will already possess knowledge structures relevant to the creation of a new schema for this type of poetry. Figure 2.4(a) depicts how a portion of these structures might be diagrammed prior to the student’s exposure to the new concept. Poetic genres already familiar to the student are stored in association with the general concept of poetry, which is in turn related to the larger notion of written forms, and so forth. Figure 2.4(b) illustrates how the memory structures might look after the new concept has been learned. The learning has not involved the alteration of existing schemata, other than by the addition of a new schema for haiku. This new schema fits conveniently into what the student already knows.

Expansion of Existing Schemata. You may have had occasion as a high school biology student to dissect a frog. Your laboratory manual and the actual experience itself doubtless served to introduce many new facts about frogs, facts that greatly complemented your prior knowledge. These new facts are not likely to have contradicted any of the assumptions you may previously have made: that frogs are usually green, and that they have a certain size and shape, webbed feet, slick skin, and so forth. Rather, the new information tended to amplify, extend, and supplement what you already knew. You were not compelled to “unlearn” anything in order to make room for the new facts. Piaget (1952) described the process by which existing schemata are extended in this fashion as *assimilation*. This is likely to occur whenever one’s background knowledge is relatively broad so that new information fits rather well into existing cognitive structures. In such cases, the new information is largely congruent with the old.

Alteration of Existing Schemata. What happens when new facts are encountered that do not square with what an individual believes to be true? One of two things can occur: The person can either reject the information or accommodate it by altering prior knowledge accordingly. Piaget’s notion of *accommodation* (like that of assimilation) was not limited to reading but

FIGURE 2.4

Example of the assimilation of a new schema

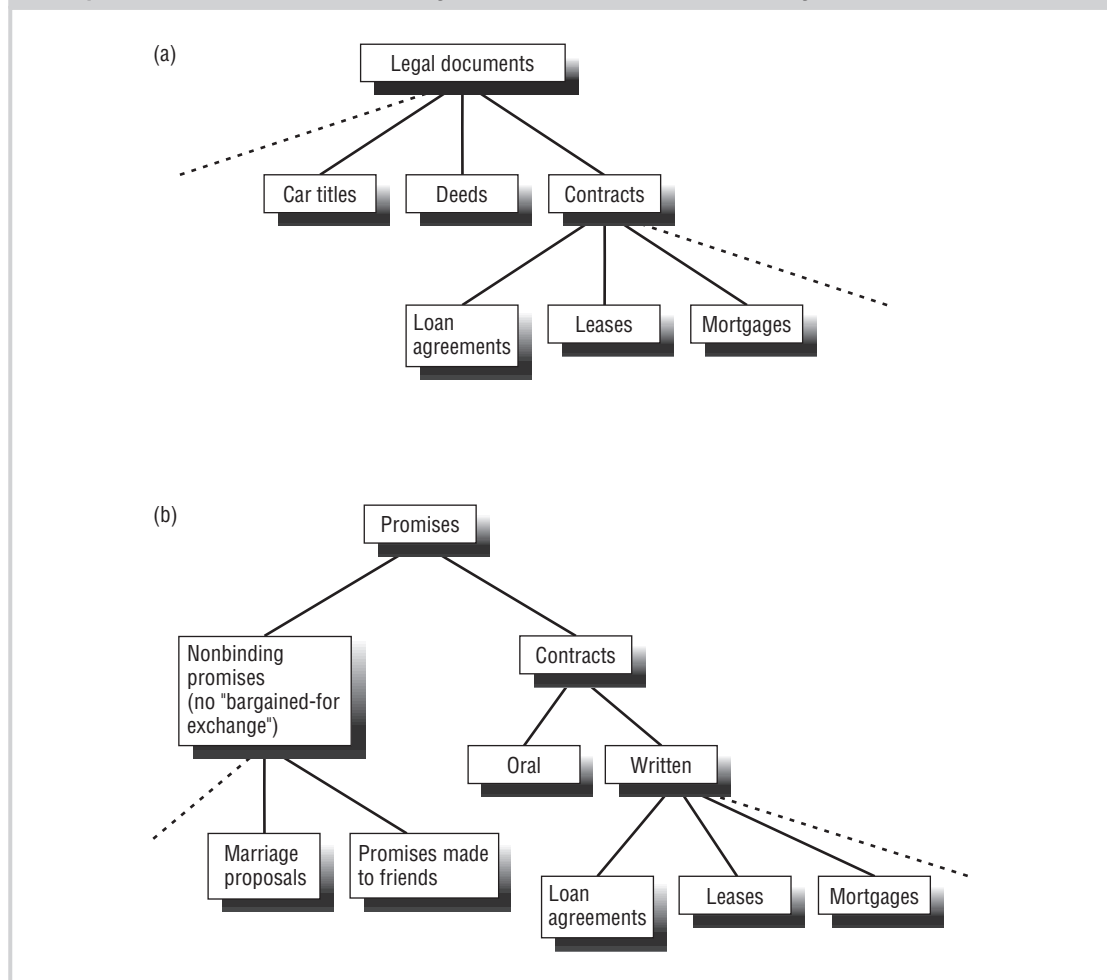


extended to all learning situations. Imagine, for example, that you were told something shocking about a close friend, someone you'd known for years. You might question your source, dismissing the new information as false because it is so out of character for your friend. If you were to accept the new information, however, it would not be possible to maintain an unaltered schema of your friend. The new fact would need to be accommodated by changing the way you think about your friend. "Well," you might conclude, "this adds a whole new dimension to my friend's character."

In the circumstances of reading, comparable events occur. Let's return to our business law student, who may read the following definition in a textbook: "A contract is a promise, or a set of promises, for the breach of which the law prescribes a remedy." Like so many technical vocabulary terms, the word *contract* has many meanings beyond the precise usage of the text, and some of these may be known to the reader in advance. A portion of a typical student's schema for contracts might be diagrammed as shown in Figure 2.5(a). Here the concept of contracts has been stored in association with the broader notion of documents. It is also stored with numerous examples, personal experiences, and so on, all of which might comprise a typical individual's nontechnical knowledge of contracts. The new information, however, suggests that contracts

FIGURE 2.5

Example of how new information may be accommodated into memory structures



are incorrectly classed as documents, for in fact, many enforceable contracts are oral in nature. Further reading and discussion might leave the student's schemata in the substantially altered condition approximated by Figure 2.5(b). As we will see in later chapters, new ideas that require us to “unlearn” some of our previous beliefs are among the most difficult to teach. Despite students' unwillingness to accept new ideas that might change their beliefs or schemata, however, the content teacher is often in an ideal position to challenge accepted ideas (Fly, 1994; Menke & Pressley, 1994).

The Role of Purpose in Reading

As we read, it is vital that relevant schemata be activated, or “switched on,” so that new information can be integrated with existing knowledge. Assume, for example, that a friend has agreed to meet you for lunch but that the place and time have not been decided. You then receive the following text message from your friend:

c ya IF uniun @ 12 or call b4 10.

As you begin to read, your focus is limited to certain elements in the message according to your purposes for reading. Overall, you expect your friend to specify the time and place of your meeting. You look for and find these facts. While the number 12 can have two meanings, your purpose and prior knowledge assist you in knowing precisely what meaning to give it. Likewise, the Student Union may contain a myriad of shops, meeting rooms, commons, and so forth, but

*Books must
be read as
deliberately and
reservedly as they
were written.*

HENRY DAVID
THOREAU

you know that the abbreviation IF stands for *in front of*. Because the time and place are both specified in the first part of the message, you create a new expectation with regard to the second part, and a refined purpose for reading it. You may suspect that it probably conveys some further specification or clarification.

In the course of reading, your purposes have caused appropriate schemata to come into play. (Note that this is usually an unconscious process.) At the broadest level, you have a schema for text messages, and perhaps even for those sent by your friend. Your schemata for lunch and Student Union are also helpful. The former, in fact, prevented you from even considering that 12 might have meant midnight! At the lowest, most local levels, your expectations also shaped what you consciously attended to in terms of individual words and abbreviations. Even though you are likely to have processed every letter of every word (Adams, 1990), your purposes for reading helped determine what information you eventually considered, interpreted, and remembered (Linderholm & van den Broek, 2002). For example, you probably noticed the spelling error in the message (*uniun*) but were quickly able to determine that it was an error.

The Writing Process

Think back to a recent writing task: a letter to a relative, an essay exam question, or a memo to a colleague. It is likely that you began with relatively general ideas about what you wished to convey through writing. Even if you had a wealth of information from which to choose, as might have been the case with an exam question, it is highly unlikely that this information existed in a form anything like complete sentences ready for transcription. Rather, your task was one of selecting, organizing, and finally encoding your thoughts into coherent prose form. Your own experiences may cause you to empathize with Johnson's comment on just how laborious this process can be when it is done well. However, the benefits of writing more than justify the effort required, for the writer's thoughts are clarified, extended, and reorganized in ways only writing can accomplish.

Composition is, for the most part, an effort of slow diligence, to which the mind is dragged by necessity or resolution.

SAMUEL JOHNSON

The Role of Intentions in Writing

Although we think of writing chiefly as a means by which one individual communicates with another, it is also a process by which writers communicate with themselves. As you rely on your overall (global) intentions to help you compose the first sentence of a paragraph, the ensuing sentence will depend not only on the global intentions with which you began but also on what you expressed in the preceding sentence. In this way, global intentions help shape "local" intentions as each new sentence is written (Smith, 2004).

The writer's relationship to print is an interactive one. Intentions (from global to local) help in formulating sentences, but their very formulation causes changes in the writer's thinking. Ideas become crystallized in print, "visible" in a sense, encoded for close inspection, not only by the reader but by the writer as well. The act of committing ideas to print tends to refine and revise one's own intentions in writing.

Let's compare this process with that of reading. While reading each new sentence, we alter slightly the overall reconstruction of meaning that is mentally forming. While writing, we also alter, with each new sentence, our inner conceptualization of the content. This happens because writing forces us to clarify and organize our own thinking before we can put it into words (encode it) for others. For this reason, reading and writing are remarkably similar as ways of enhancing our understanding.

It is true that writing is a slower and less fluent process "because its very slowness makes it more deliberately self-conscious, enhances our sense of details and choices" (Connolly, 1989, p. 10). Nevertheless, the similarities are striking. For both the reader and the writer, meaning is constructed through processes in which printed language is used as the primary tool (Squire, 1983).

The present-day view that writing, like reading, is a constructive process has long been realized by skilled writers, as E. M. Forster's remark suggests. This view has a major implication for teaching content, one we have already stressed in Chapter 1: Writing can be utilized as a means through which students can clarify, analyze, and integrate their own thoughts about, and

How can I know what I think till I see what I say?

E. M. FORSTER

knowledge of, subject matter (Myers, 1984). A colleague of ours recently confided that the experience of writing a textbook on the teaching of reading helped him clarify his own thinking on the subject. While we may tend to regard the knowledge possessed by authorities as being at all times precisely organized and articulated, this is simply not the case. For novice and expert alike, writing is a wonderfully illuminating experience!

Two Kinds of Writing

Britton and his colleagues (Britton, Burgess, Martin, McLeod, & Rosen, 1975) offered a distinction between *transactional* writing, which targets a particular readership and is undertaken to inform, persuade, or instruct, and *expressive* writing, which amounts to “thinking on paper” and is intended for the writer’s own use. The notes one makes prior to formulating the actual sentences of connected discourse are apt to be expressive in nature. They tend to be “messy, exploratory” (Rose, 1989, p. 16). The notes might be as thoroughly delineated as a formal outline or as cryptic as a mere word or phrase used to capture a complex idea, depending on the experience and sophistication of the writer. Each kind of writing is useful in content classes. Here are some examples of writing activities we will revisit in coming chapters.

Transactional Writing

essay
summary
encyclopedia entry
letter

Expressive Writing

personal journal
learning log
class notes
answers to questions

Expressive writing is often an end in itself. We might take notes, for example, and never take the time to develop them further. On the other hand, expressive writing sometimes leads to transactional writing, as when notes are used to compose an essay or summary.

Both kinds of writing are effective means of enhancing content learning, and we emphasize that both have a place in content classrooms. Of course, we are very much aware of the concerns of content teachers. It is one thing to note that essay writing leads to high levels of content understanding (Vacca & Linek, 1992), but such activities must be balanced with the time they require. Throughout this text, we will offer a number of ways in which both kinds of writing can be incorporated into content classrooms, and our aim will be to provide for a realistic balance between means and ends.

Before and after Writing

Transactional writing, although time-consuming, holds great potential for deepening content understanding. We now place the process of transactional writing in a larger context if we are to appreciate its potential for content instruction. Current recommendations suggest more than a single step in the process of writing (Moore, 2011). Although such models differ as to the number and nature of steps, all include (1) planning activities carried out in advance of writing and (2) revising activities undertaken afterward.

Preparing to Write. The famous psychologist B. F. Skinner (1981) recommended that the pre-prose stage be extended as long as possible, both because the writer’s thoughts tend to remain fluid and because once the effort is expended to compose sentences and paragraphs, there is a powerful resistance to dismantling them, even when the need to do so becomes clear. Despite these reasons, there is usually an impatient rush to get past the planning phase and on to the writing itself. Students must be cautioned to be deliberate in their planning, which, when done properly, actually tends to reduce the time spent “writing.”

The sense of readership needed for transactional writing is vital to good planning and is frequently ignored by students. After all, they know they are writing for the teacher, whose knowledge base is assumed to be extensive enough for accurate interpretation of anything they might say. The result can be highly assumptive, “inconsiderate” writing that fails to express ideas adequately (even for an audience of one—the teacher!). The observation of the French novelist Albert Camus is an insightful one. It suggests that students, from the planning stage on, be

Bad authors are those who write with reference to an inner context which the reader cannot know.

ALBERT CAMUS

Nothing you write, if you hope to be good, will ever come out as you first hoped.

LILLIAN HELLMAN

encouraged to monitor their writing carefully to avoid assumptions about knowledge the reader may not actually possess. An increasingly popular way to provide such encouragement is to arrange for situations in which students write not for the teacher alone but for other students, whose prior knowledge of a topic may be minimal. Writing for readers beyond the classroom is another effective means of getting students to think about what their readers may not be likely to know. Coker and Lewis (2008) have, in fact, stressed that teachers should be “creating meaningful writing assignments that have real purposes and real audiences outside of the classroom context” (p. 245).

Revising What Is Written. Capable writers are rarely satisfied with first drafts. Revision represents a second chance to bring expressed meaning into closer alignment with the writer’s intentions. The need for targeting a specific readership is never more important than when revising, for the writer now becomes a reader—not in the ordinary sense but with the purpose of role-playing the sort of reader eventually targeted. Sentences are reconsidered in the complete context of the draft; awkward expressions are corrected; prose rhythms are tested; mechanics are mended.

Most models of process writing now make an important distinction between revising and editing. *Revising* entails conceptual changes that involve organization and expression. *Editing* entails the finer points of usage, grammar, and punctuation. Although in practice the two are often intermingled, revising should *generally* precede editing so that conceptual thinking is not sidetracked by a concern over minutiae. Both revising and editing have long been a problem for content area applications because of the time they require. Word processing, however, offers a means of speeding up both processes and of helping students devote more of their concentration to content (Cochran-Smith, 1991). We will revisit word-processing applications in later chapters.

Making Sense out of Content

Consider the following two statements about how students acquire knowledge. Which one is closer to your own perspective?

1. The student’s mind is like a vessel, to be filled by the teacher with specific knowledge.
2. The student constructs an individual representation of knowledge by interacting with the world.

These statements represent markedly different views of how knowledge develops. The first suggests that the process is a passive one and that the result is the “transmission” of knowledge, more or less intact, from teacher to learner. The second suggests that knowledge building is an active process that results in a unique conceptualization of content in the mind of each student. Our experience is that many content specialists prefer the former view. Research, on the other hand, very clearly supports the latter.

The result, however, is not a hopeless impasse. While different, the two viewpoints are not contradictory. A teacher may engage students in active encounters with content and nevertheless ensure that particular concepts, ideas, and skills have, in fact, been the result of such encounters. Students will construct their own ideas about content, to be sure, but teachers can guide the process so that the result, while unique to each student, nevertheless meets desirable curricular standards.

What we hope to show in this text is that reading and writing are tools a student can use in the process of constructing content knowledge. In the case of reading, the student attempts to *reconstruct* what an author intends, of course, but this is not the same as transmitting the author’s message unaltered into the reader’s preexisting memory and beliefs. The student does not stop at reconstructing what one author intends but uses the experience to further *construct* a more global knowledge of content. Our point is that while many educators tend to view the two statements above as offering an either-or choice, there is in fact a middle ground that we believe offers the best results. The RAND Reading Study Group (2002) has offered a widely accepted definition of comprehension. It involves both extracting meaning from text and at the same time constructing a mental representation that makes sense. This definition stresses the importance of both aspects of comprehension. Indeed, it may be impossible for one aspect to operate without the other.

Assisting English Learners

The Output Hypothesis

Two competing theories—with very practical implications—have caused a debate among researchers who study English language learners. The older theory is called the input hypothesis. Its proponents held that what English language learners need most is an environment rich in English. By being bombarded with plenty of good input, they will eventually attain proficiency. A more recent theory suggests that input is not enough. English learners must also be given ample opportunities to generate language, both in spoken and written form. This theory, called the output hypothesis, does not deny that hearing and reading English is important, but it argues that input alone is not enough. Research has declared a winner—the output hypothesis. Think about the implications for content teaching. Providing English language learners with low-risk chances to speak and write are important for their continued growth as proficient users of English (Short & Fitzsimmons, 2007). In content area classrooms, this prospect may require you to consciously consider the activities you plan.

SUMMARY

Language consists primarily of symbols (written and oral) and rules for combining those symbols into meaningful relationships. Most languages have both oral and written forms, and most written forms are alphabetic. In alphabetic languages, a small number of letters are used to represent basic speech sounds. Written language developed after oral language and involves a second system of symbols (visual) that overlies the first (acoustic).

Writing is a language process by which one attempts to “construct” with words a document that conveys an intended message. A mental construction of the message also occurs during writing as the writer’s own thoughts are sharpened and clarified. Reading is a process by which one attempts to mentally “reconstruct” such a message from its printed representation. The extent to which the reconstructed message matches the one originally intended by the writer is the extent to which communication occurs.

In reading, new information encountered in print is integrated into existing knowledge structures called *schemata* (plural of *schema*). Schemata are best described as categories of knowledge corresponding to concepts. Schemata are interconnected in memory by associational links. As one reads, new schemata might be formed, or existing schemata might be expanded or altered. Because new information is always learned in relation to previous knowledge, it is important for a reader to have certain purposes and expectations about what a reading selection contains so that appropriate prior knowledge can be brought to bear.

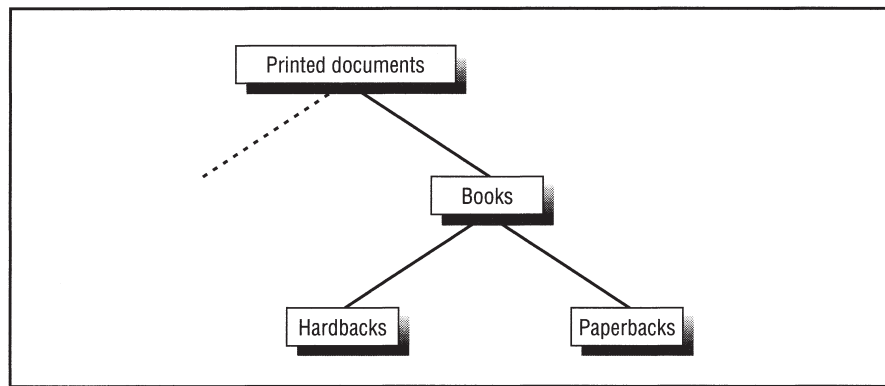
Whereas reading is guided by what one seeks and expects, writing is guided by what one intends. Intentions guide the writer’s choice of words, sentence structures, organizational patterns, and so on. Writing is now recognized as a powerful learning tool by virtue of its help in clarifying, refining, and organizing what one knows about a topic. Prior to writing, it is important to make brief notes as one examines one’s own prior knowledge. It is vital at this point not to worry about forming complete sentences and paragraphs. In this way, thoughts remain fluid longer as one actively considers, manipulates, and rearranges them. After writing, it is important to revise. The objective is for the writer to role-play the targeted reader and to read for the purpose of determining whether the intended meaning has been successfully incorporated into print.

Getting Involved

1. Imagine yourself in an airplane heading due south over downtown Detroit. If you continued on this course, what is the first foreign country over which you would pass? A group of our students produced such well-reasoned guesses as Mexico, Cuba, Guatemala, and so on. They were wrong. The correct answer is Canada, because an arm of Ontario extends just to

FIGURE 2.6

Diagramming the concept of books as it relates to larger and smaller concepts



the south of Detroit. If this fact surprised you as much as it did our students, you have just experienced an alteration in your geographical schemata as the new information was accommodated. Unusual facts, and their resulting accommodation, can be interest-arousing as well as instructional. Can you think of such a fact in your own subject area that might be used to evoke surprise and encourage student engagement at the beginning of a lesson?

2. Consider the concept of books. In memory, you already have an extensive schema for books, and this schema involves many meaningful associations with other concepts. For example, what concept would include books as an example? That is, a book is a type of what? By the same token, name a specific kind of book—a member of the category called “books.” Figure 2.6 shows how these relationships can be diagrammed to produce a depiction of part of your schema for books. Note that, similar to the examples of Figures 2.4 and 2.5, larger concepts appear higher in the diagram.

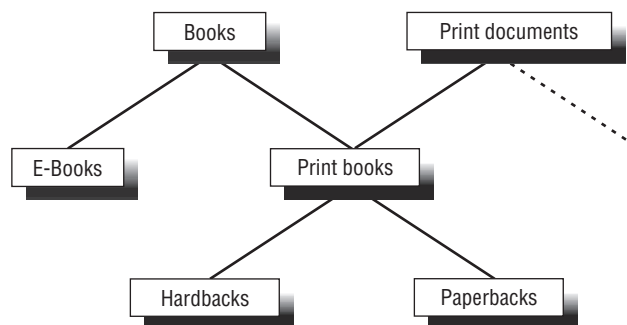
But wait! What about electronic books (e-books)? Hasn't technology forced us to change our ideas about what makes a book a book? Where do e-books fit into our schema? Do we need to change the way we conceptualize books, perhaps along the lines of Figure 2.7?

Can you think of another example of how you have had to change a knowledge structure in this way because of developments in the world around you? How might you diagram the change?

Do you think constructing and discussing such diagrams with students as they encounter new vocabulary might be productive?

FIGURE 2.7

A schema for books that includes e-books



3. In the meantime, free-associate from the concept of books. Make a mental list of ten other words suggested by the word *book*. In so doing, you've exposed more of your vast schema for books and, we suspect, demonstrated that it includes much more than the simple category memberships outlined in Figure 2.6. Now imagine having gone through a similar process for each of the ten related concepts you listed. If you continued in this way, you would soon have included thousands of concepts arranged in a vast network of hubs and spokes, similar to a highway map. And, as with a map, it would be possible to "travel" from any given concept to any other concept by means of associative links. Conceptualizing memory in this way suggests that new concepts are best learned when key associations with known concepts are emphasized. Think of a technical term from your own discipline. What concepts do you suppose might have been previously taught that your students should associate with the new term? Do you think a review of these prior concepts would be helpful before introducing the new one?



Go to the Topic <insert topic name> in the MyEducationLab (www.myeducationlab.com) for your course, where you can:

- Find learning outcomes for <insert topic name> along with the national standards that connect to these outcomes.
- Complete Assignments and Activities that can help you more deeply understand the chapter content.
- Apply and practice your understanding of the core teaching skills identified in the chapter with the Building Teaching Skills and Dispositions learning units.
- Examine challenging situations and cases presented in the IRIS Center Resources.
- Check your comprehension on the content covered in the chapter by going to the Study Plan in the Book Resources for your text. Here you will be able to take a chapter quiz, receive feedback on your answers, and then access Review, Practice, and Enrichment activities to enhance your understanding of chapter content. (optional)
- Visit **A+RISE**. A+RISE[®] Standards2Strategy[™] is an innovative and interactive online resource that offers new teachers in grades K–12 just-in-time, research-based instructional strategies that meet the linguistic needs of ELLs as they learn content, differentiate instruction for all grades and abilities, and are aligned to Common Core Elementary Language Arts standards (for the literacy strategies) and to English language proficiency standards in WIDA, Texas, California, and Florida.