

Wendy for her contributions to the refinement of the thinking that unfolds in this work. We are a family of teachers: Wendy is an orchestra teacher at Oregon Middle School, and my son Jeremy, a social studies teacher at Madison East High School, and his wife Mandi, a chemistry teacher at Watertown High School, represent the next generation of teachers in the family. I would like to thank Jeremy for his thoughts on portions of this manuscript and for his astute observations on literacy issues in today's classrooms. Finally, conversations with my son Christopher, a biochemist working on his doctorate at Michigan State University, have helped hone my thinking on the science-related segments of this book.

CHAPTER 1

Mentoring Students in Disciplinary Literacy

Essential Question: *Why is there a significant need for disciplinary literacy instruction?*



How would you describe yourself as a reader? That you are a reader is a given—you are reading this chapter, for example. So, if you talked about yourself as a reader, what kinds of things would you say? Some of your comments might be related to *what* you read: “I have several magazines I enjoy.” “I never miss the sports section in my newspaper.” “I prefer biographies.” “I do a lot of on-the-job professional reading.” “I have some favorite authors of popular fiction.” “I am online several times a day, tracking the postings in some favorite blogs and websites.” “I’m never without a book.”

Some of your comments might concern *where* and *when* you read: “I read in bed every night before I go to sleep.” “I always have something to read when I am traveling.” “I read constantly throughout the school day.” “I like to relax and do some reading with a cup of coffee when I get home from work.” “I catch up on my leisure reading during the summers.”

Some of your comments might detail *how* you read: “I get completely lost when I am reading something that really grabs me.” “I have always been a slow reader.” “I am one of those people who have to mark up a text when I need to do careful reading.” “I am quite critical as a reader and tend to talk back to an author in my head.” “I am a very methodical reader, pausing frequently to ponder what I have understood so far.”

Some of your comments might express *why* you read: “I am very conscious of keeping up with the most recent findings in my discipline.” “It is important to me to follow what is going on in the world each day.” “I usually have a lot of student work to read.” “I find that reading helps me unwind after a stressful day.” “I would be bored if I did not have

something with me to read.” “Reading is just central to who I am. I cannot imagine my life without reading.”

Reading and Identity

Your personal what, where, when, how, and why descriptions represent your reader profile. Obviously, when we talk to each other about our personal reading, we reveal reader profiles that may perhaps share some elements but differ dramatically with others. Let me use myself as an example. Recently, I embarked on a rather ambitious reading project: Francis Parkman’s monumental seven-volume *France and England in North America*. It took Parkman nearly his entire adult life to recount the unfolding drama between the two European superpowers as they vied for supremacy on the North American continent. It looks like it will take me most of a year—reading Parkman interspersed with a variety of novels, periodicals, informational books, and professional material—to arrive at the climactic resolution in 1759 on the Plains of Abraham, as Volume 7 takes me to the decisive battle of Québec.

Does spending extended hours with a 19th-century historian who strived to contribute to our understanding of a critical but little known period of North American history sound interesting? Or, to ask it another way, would you choose to read a work such as this? And if so, why?

For me, the Parkman history allows me once more to slip into one of my identities, that of historian. I majored in history as a university undergraduate and began my career in education teaching high school social studies. I have always been an avid reader of history, even back to my years as an elementary school student, when I would page through volumes of the family *World Book Encyclopedia*, skipping everything but the entries that dealt with historical events and people. As a preteen, I checked out from our school and community libraries pretty much all of the Landmark series of histories written for adolescents (I was apparently about the only reader of some of them). I also was constantly on the lookout for articles that featured historical themes as I leafed through newspapers and magazines. By the time I was in high school, I had accumulated a personal library of several shelves of paperbacks on topics ranging from the genius of Hannibal to the grimness of Verdun.

I currently have an entire wall in my home devoted to my history hardcovers—but there I go, talking about myself as a reader.

Of course, my reader profile encompasses many other identities in addition to historian. For example, sometimes what, when, and why I read is sparked by my identity as a public school teacher. In addition, I have an identity as a literacy educator, which leads me to target the subset of texts written within the educational profession that emphasize reading and writing instruction. I have an identity as a voracious reader of fictional literature, with my tastes running from classical to contemporary works. Additional identities that intersect with my reading would include baseball fan, humorist, moviegoer, home improvement practitioner, traveler, adult male, family member, baby boomer, political liberal, and global citizen, to name a few.

Literacy theorist Gee (2000) describes identity as being “a certain ‘kind of person’” (p. 99). Because we all display multiple identities, it can be helpful to elaborate a bit more on who we are. Gee subdivides identities into four categories:

1. Identities that are part of our *nature* and over which we have little control (e.g., I am white, European American, an adult male, and an oldest son)
2. Identities that are related to *positions* that we have attained and that may be confirmed by various groups or institutions (e.g., I am a college graduate, public school teacher, married person, U.S. citizen, and Wisconsin resident)
3. Identities that reflect *personal traits* or characteristics that others recognize in us and that define us as individuals (e.g., I have a good sense of humor, am handy with woodworking, and listen to classical music)
4. Identities that we share with others through our *associations* with them or through group memberships (e.g., I am a Milwaukee Brewers fan, Democrat, adolescent literacy advocate, and International Reading Association member)

My various identities very much influence my personal profile as a reader. Because of these identities, my reading profile includes the daily

New York Times, Yahoo! sports postings, Ward Just political novels, e-mails from family, Newsweek magazine, museum circulars, teacher union newsletters, the *Journal of Adolescent & Adult Literacy*, a myriad of other texts, and yes, histories like Francis Parkman's seven volumes. My reading is an extension of who I am, and my abilities as a reader allow me to extend who I am.

REFLECTION INTERLUDE

The term *reader* often presumes a connotation of book reader. Yet you can see that my reader profile encompasses a wide range of texts (that yes, do include books). Consider for a moment your profile as a reader, and the identities that most govern what, when, and why you read (see Figure 1.1).

Figure 1.1. What's Your Reader Profile?

Identity	So I read...

Our shared identities as teachers mark us as members of a community whose personal reader profiles often coincide. For example, we are all readers of the variety of texts encountered on the job in our schools, from e-mails to district directives. We all tend to read educationally relevant items in newspapers, magazines, and online. We all read materials that guide our professional growth, such as this book. We have examined standards documents, policy statements, and educational proposals, theories, and ideas. We read student work regularly in our role as classroom instructors. Our shared identity makes it likely that we have read, continue to read, and are interested in reading similar things.

Yet, obviously at many points, our identities diverge. Within the educational profession, some of you share an identity as mathematicians,

scientists, language teachers, fitness experts, musicians, or technology specialists, as well as other identities. Your profiles as readers will look markedly different from mine and from each other's.

Fostering Academic Identities

Of course, not everything that I have read over the years has necessarily been a matter of choice. Like all of us, I have read many texts that I felt obligated to read. Sometimes, I felt personally obligated. For example, I recently felt obligated to carefully read the directions for assembling a table saw, obviously for pragmatic reasons. Sometimes, others have obligated me. Frequently, I am asked to read something to satisfy workplace expectations, such as material distributed at a faculty inservice meeting. Additionally, like our students, I have been obligated to read numerous nonchoice texts in my role as learner in school and college contexts.

REFLECTION INTERLUDE

Pause for a moment and revisit your personal reader profile. What are the arrays of written texts, from formal to informal, that you have read? Which of these would you call choice texts—things that you desired to read—and which would you consider obligation texts—things that you, or someone else, felt you needed to read. Next, reflect on your experiences reading obligation texts as you progressed through your years of education (see Figure 1.2).

Figure 1.2. Revisiting Your Reader Profile: Choice Texts Versus Obligation Texts

Choice Texts (I wanted to read...)	Obligation Texts—Personal (I felt obligated to read...)	Obligation Texts—Others (Someone else obligated me to read...)

It becomes increasingly clear that as readers, we do not read all texts with equal competence, need, interest, and enthusiasm. Obligation texts, in particular, can be problematic for us. What happens to us as readers when we are obligated to stray outside our identities to tackle texts that do not reflect our preferred ways of thinking and interacting with the world?

Student Identities

Coping with obligation texts is no different for our students than it has been for us. Consider the various identities that our students might bring to the classroom and how these identities could affect their personal reading profiles. First, like us, many of the students' identities do not necessarily seek out the kinds of reading that is expected in school and within academic disciplines. To use Gee's four identity categories, we will meet young people who have nature identities as teenagers, adolescent boys, African American females, Latina immigrants, students with learning disabilities, or English learners. Second, these young people occupy roles and positions in society that include identities as diverse as dependent children, high school sophomores, talented and gifted individuals, persons living in poverty, licensed drivers, restaurant employees, children of divorced parents, or adjudicated juveniles. Third, in terms of traits and characteristics, we will meet young people who see themselves, and are recognized by others, as the kinds of persons who text, listen to hip-hop, are shy, are athletic, are not good readers, are skilled at working with their hands, are vegetarians, aspire to be popular, are rebellious, and on and on and on. Finally, we will meet students who identify with others and display association identities as widespread as soccer teammates, Twilight readers, Spanish speakers, video game players, Comedy Central watchers, taggers, Lutherans, school band musicians, Facebook friends, gang members, and community volunteers.

During the past decade, researchers have been intrigued by the out-of-school literacies employed by young people (e.g., Alvermann, 2002; Alvermann, Hinchman, Moore, Phelps, & Waff, 2006). For example, students communicating through text messaging and online social networking, such as MySpace and Facebook, are displaying a host of literacy behaviors that may represent a significant segment of the students' personal reader profiles. Some researchers (e.g., Hagood, Alvermann, & Heron-Hruby, 2010) have suggested that educators need to explore ways to

factor in the breadth and volume of reading and writing practices that are central to the reader profiles of many of our students, based on their out-of-school identities.

However, the emphasis in this book is on the honing of in-school, or academic, literacies. As literacy researcher Moje (2008) so cogently observes,

Although literacy educators and researchers acknowledge the value and power of the knowledge, practices, and texts young people bring to school, it is also critical that we work to expand youth knowledge, practices, and texts as a function of education. Young people do not need to go to school to learn what they already know; content literacy instruction can help youth gain access to the accepted knowledge of the disciplines, thereby allowing them also to critique and change that knowledge. (p. 97)

Very likely, only a modest number of our students will have articulated association identities, such as future historian, future mathematician, or future scientist. A number of students will exhibit more vague inclinations as traits identities: the type of person who is good in math, likes science, is interested in history, enjoys reading fiction, or has a talent in art. Most students will articulate aspirations to more general and careerist position identities (e.g., "I am going to be a [doctor, business person, construction worker, computer technician, elementary school teacher, or police officer]"), tentative identities that may shift relatively frequently.

Identities and Literacy

Clearly, students' academic identities matter a great deal when we consider students' abilities and willingness to meet the literacy demands inherent in learning within content disciplines. As Moore and Onofrey (2007) conclude, "Students who enact claims as insiders to classroom reading and writing, who assert membership in particular classroom literacy communities, have an academic advantage" (p. 287). Some academic identities can empower students as learners: "I am the kind of student who likes to learn things." "I am the kind of student who gets my work done." "I am the kind of student who will be successful if I make the effort." "I am the kind of student who is a good reader." Other academic identities can undermine academic performance: "I am the kind of student who does not do homework." "I am the kind of student who does not get math." "I am the

kind of student who probably will not understand even if I try." "I am the kind of student who avoids reading." "I am the kind of student who hates school."

As teachers, we can play a significant role in these dynamics of identity formation. Academic identities can be fluid rather than static, and the instructional context can make a dramatic difference for developing and shaping students' conceptions of themselves as readers and writers (McCartney & Moje, 2002). Gee (2001) labels as discursive what I have referred to as traits identities because of the crucial role of language and dialogue in their development and maintenance: They are the things we tell ourselves about ourselves but are also the things others tell us about ourselves. Others can reinforce or challenge what we say about ourselves.

Our role as teachers and mentors is especially critical for developing students as readers, writers, and thinkers in the different academic disciplines studied in middle and high school classrooms. In *Choice Words: How Our Language Affects Children's Learning*, Johnston (2004) extensively examines the powerful relationships between what we as teachers tell students, the language we use, and the emerging academic identities of our students:

Building an identity means coming to see in ourselves the characteristics of particular categories (and roles) of people and developing a sense of what it feels like to be that sort of person and belong in certain social spaces.

As children are involved in classroom interactions, they build and try on different identities....Teachers' comments can offer them, and nudge them toward, productive identities. (p. 23)

Teachers may unintentionally reinforce problematic identities, such as "I am not any good at doing this," or "I am not a science person." Or, teachers can directly through their language encourage the creation of new identities: "As a person thinking like a scientist, what might you suggest?" "What did you notice as a reader when you read that passage?" Both of these statements explicitly position students as individuals who are perceived as scientist types and as readers. Ultimately, academic identities that empower learning begin to emerge: "I am able to do things I could not do before." "I can learn things by reading about them." "I am able to handle challenges in math."

Reading in Academic Disciplines

As teachers, each of us has academic identities that have evolved over our years of schooling and that have eventually centered on specific disciplinary preferences. Obviously, my interests in and experiences with reading history-themed material have led me to approach such texts with confidence and purpose. I certainly gravitate toward reading history as choice texts, but I have also been receptive, and frequently eager, to undertake the reading of history as obligation texts, even when such texts were difficult or not particularly motivating.

Over the years, I have internalized how to read history texts. When I read through a historian lens, I automatically shift my thinking in certain characteristic ways to examine what an author is saying. Questions occur to me that parallel what historians might want to know and care about: What does this author say happened and how did the author find out? Why does the author believe this happened? Why does the author think this matters? I track indicators of the author's personal beliefs, perspectives, and points of view as I weigh the author's explanations and conclusions. I focus on how this knowledge can inform my insights into who we are and how we have gotten to this point. Reading through a historian lens helps me prioritize what to look for and provides me with a mental template for cutting to the gist of a message and constructing the big picture of what an author is saying. Thinking this way as a reader comes naturally to me now. I just do it.

Personally, I also recognize that my historian lens has often been my default mode for many of the texts that I read. As a result, I might read, say, a newspaper article and come away with a take on what an author was saying that contrasts with what a colleague has understood. In our conversations, we discover that we read through different lenses; perhaps she read the article more like a scientist or focused on the literary qualities of the writing. Consequently, we may have asked ourselves different questions, noticed different aspects of the message, drew on different background knowledge, organized our thinking in different ways, and arrived at somewhat different conclusions. Yet we both read with comprehension.

I realize that there are times when reading through a scientific lens, a literary lens, a mathematical lens, or others is more appropriate for organizing my thinking and reaching understanding. As a learner,

it became readily apparent to me that reading like a historian would not suffice when tackling an algebra textbook or studying chemistry chapters. Although mathematic or scientific modes of thinking may not be my preferred interaction with the world and with texts, I have over the

years learned to adjust my thinking to match these needs as a reader more directly. I have developed the capacity to comprehend a range of texts that sometimes fall outside my immediate comfort zone. It may not always be my choice, but I can do it.

Our students face these same challenges every time the bell rings during a typical school day.

Like you, some students' academic identities may lean toward some disciplines, such as science or math, and away from others, such as history or literature. Yet, for many students, none of these academic identities predominate. Instead, students may enter our classrooms convinced that science is hard, social studies is boring, algebra is something they will never use, and the assigned novels are uninteresting and irrelevant to them. Some will have identities more geared to artistic, musical, hands-on, technological, athletic, or other directions. For some students, out-of-school identities will be more significant to them than their academic identities. As a result, the reading that students are asked to do in some classes will more closely approximate their strengths, interests, and personal outlooks than the reading they encounter in other courses. Yet, ultimately, our students are expected to develop as competent readers, writers, and thinkers in *all* academic disciplines.

A Model of Disciplinary Literacy

What, then, does it mean to be a reader in middle and high school content classrooms? Increasingly, researchers are referring to these more specialized applications of reading and writing as disciplinary literacy (Lee & Spratley, 2010; Moje, 2008; T. Shanahan & Shanahan, 2008). With instruction and guided practice, students gradually develop the capacity to read disciplinary-specific texts through an insider perspective (Buehl, 2009c). In other words, students need to be mentored to read, write, and think in ways that are characteristic of discrete academic disciplines.

“
Readers engage in distinct thinking processes, colored by the human enterprises and habits of mind that shape academic disciplines.”

—Greenleaf, Cribb, Howlett, & Moore, 2010, p. 291

Mentoring students as insiders means they gain the ability to talk the talk of an academic discipline; they can access communications in particular subject areas through reading and listening, and equally important, they develop the facility through writing and speaking to communicate in the ways that insiders such as

historians, mathematicians, biologists, musicians, or accountants do. Students begin to develop personal disciplinary lenses for reading within different academic disciplines.

“
Each academic discipline or content-area presupposes specific kinds of background knowledge about how to read texts in that area, and often also requires a particular type of reading.”

—Lee & Spratley, 2010, p. 2

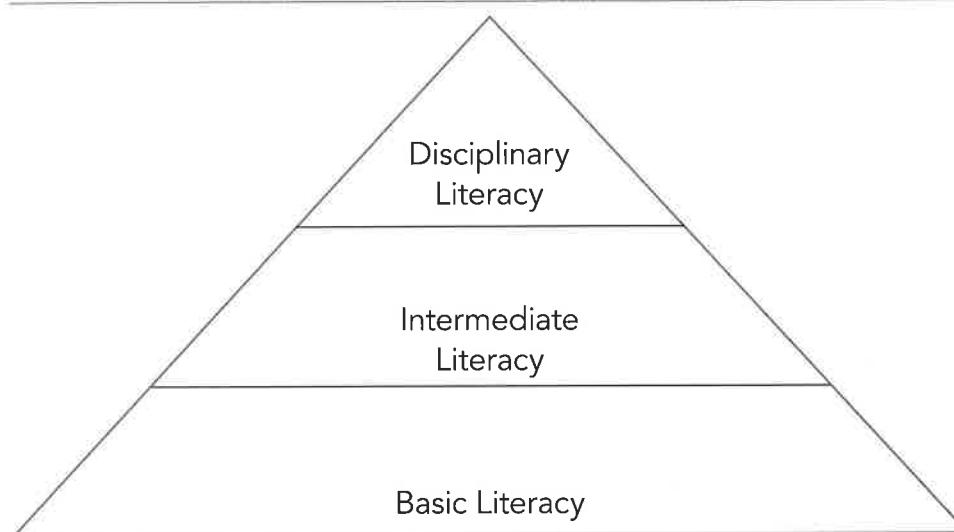
Basic Literacy

Shanahan and Shanahan (2008) have offered a model that envisions literacy instruction as progressing in three phases (see Figure 1.3). During the initial phase of instruction, basic literacy, teachers of the primary grades work with beginning readers to build the foundation for reading and writing. Students learn to decode words, recognize high-frequency words from spoken language, understand conventions of print, and attend to meaning. Typically, when middle and high school teachers talk about reading instruction, they are visualizing this basic literacy phase, which happens, say, in a first-grade classroom. When teachers of adolescents are urged to integrate reading instruction into the teaching of content areas, the teachers often respond apprehensively that they were not trained to teach reading. Of course, most middle and high school teachers are obviously unprepared to deliver basic literacy instruction to students needing this foundational phase of development.

Intermediate Literacy

The middle phase of instruction, intermediate literacy, is emphasized as students move along from primary to upper elementary grades. This is a streamlining and multitasking phase of development, as students orchestrate their thinking routines to juggle several facets of reading at once. Students improve their reading fluency, expand their vocabularies, and encounter increasingly more sophisticated texts. Comprehension strategies become increasingly important, and students are exposed to a greater variety of text structures. Although teachers of adolescents

Figure 1.3. The Increasing Specialization of Literacy Development



Note. From "Teaching Disciplinary Literacy to Adolescents: Rethinking Content-Area Literacy," by T. Shanahan and C. Shanahan, 2008, *Harvard Educational Review*, 78(1), p. 44. Copyright 2008 by the President and Fellows of Harvard College.

generally encounter very few students still developing basic literacy, teachers do encounter struggling readers who are continuing to grow their capacities in this intermediate phase: students who are not automatic word decoders, read very slowly and perhaps word by word, read the words without difficulty but do not have satisfactory comprehension, or have limited vocabularies. Some of these students would benefit from literacy interventions taught by reading specialists that provide additional practice and instruction. Yet most of these struggling readers would be effectively served by classroom support, scaffolded lessons, and differentiated instruction. In a number of districts, literacy coaches assist disciplinary teachers in planning instruction that meets the needs of struggling readers still growing intermediate literacy.

Disciplinary Literacy

The third phase of literacy instruction, disciplinary literacy, predominates as students enter middle school and move on to high school. Students

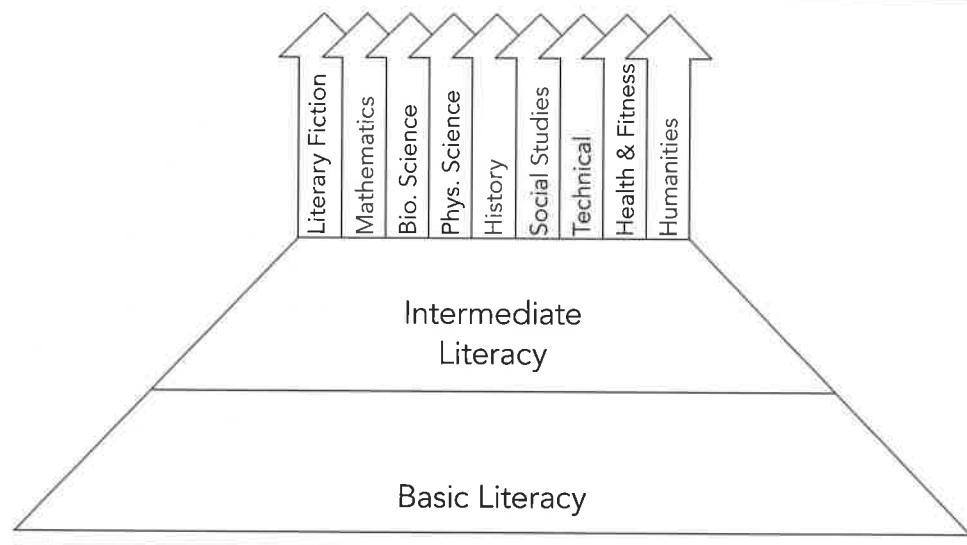
must navigate a curriculum that features arrays of texts from disparate and increasingly distinct academic disciplines. As learners, students are expected to fine-tune generic comprehension strategies to accommodate the demands of each of these different subject areas. As Heller and Greenleaf (2007) note,

To become competent in a number of academic content areas requires more than just applying the same old skills and comprehension strategies to new kinds of texts. It also requires skills and knowledge and reasoning processes that are specific to particular disciplines. (p. 10)

Disciplinary literacy necessitates that we conceptualize reading and writing as contextually dependent practices; students are expected to become many different kinds of readers and writers (Gee, 2000). As a result, a student might be quite comfortable reading fictional works in a literature class, be less proficient reading biological texts, and feel helpless understanding the algebra textbook.

Figure 1.4 displays the complicated challenges facing adolescents as learners in different academic contexts. Unlike the foundational phase

Figure 1.4. The Contextualized Nature of Disciplinary Literacy

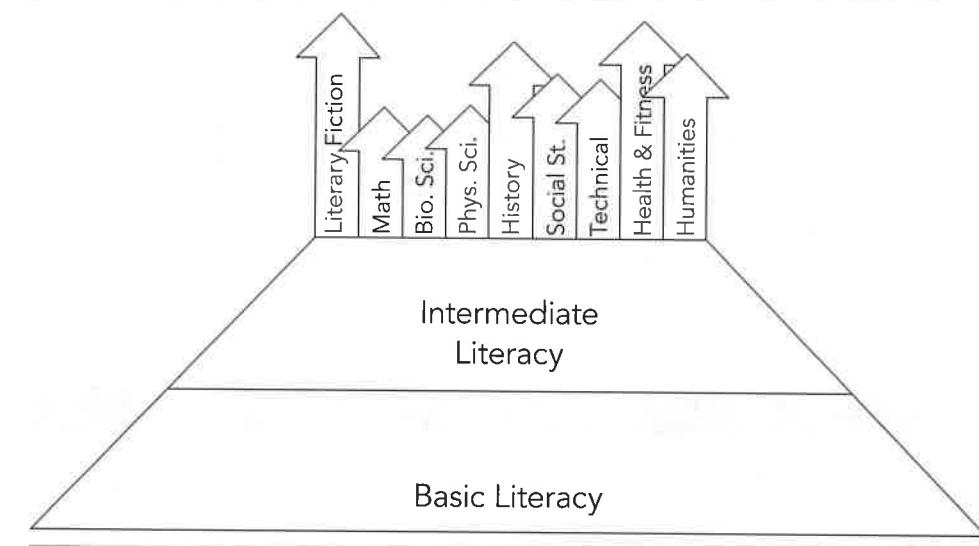


of basic literacy, and the continued general development during the intermediate literacy phase, disciplinary literacy is not one thing but many. Students are expected to gradually grow their capacities in each of the areas represented by the arrows in the figure. If, for example, students received rich literacy instruction in their English language arts classes, then we could expect them to become more competent readers of the materials emphasized in the English language arts curriculum, primarily literary fiction, such as novels and short stories, and to a lesser extent, some literary nonfiction, such as autobiography and essay. Yet what about their growth in the other towers of literacy represented in the figure? Because disciplinary literacy is contextualized, students will need similar rich literacy instruction within the disciplinary settings where other types of texts are emphasized: mathematics, biological science, physical science, history, other social studies (e.g., geography, civics, economics), technical texts, health and fitness, and humanities (e.g., art, music). In short, instruction that guides students in reading through a literary lens when interacting with authors of fiction will not prepare students to read an algebra chapter, an earth science passage, a segment of an auto mechanics manual, a recipe, a section of the U.S. Constitution, online software instructions, or information on using a heart rate monitor.

The reality is that for all of us, the figure's arrows in the disciplinary literacy phase would reveal an uneven, jagged profile, with some of the disciplinary arrows much higher than others (see Figure 1.5). All of us are more confident as readers in some disciplines and regard ourselves as less effective in others. The goal is not for all these disciplinary arrows to grow to equal heights. We know that our personal academic profiles lead us toward some disciplines and perhaps away from others. Instead, the goal is to mentor students so that they can access communications effectively in all disciplines, regardless of their personal preferences and interests. Otherwise, students' abilities to learn within a discipline become stalled, and students must rely on being told or shown what they need to know because they have not developed the capacity to independently access this knowledge as readers within the discipline.

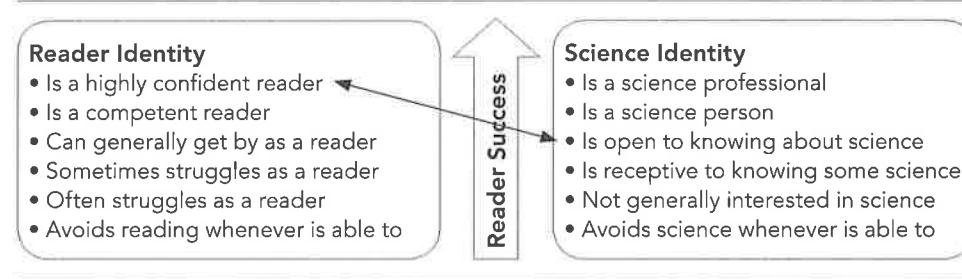
I related earlier that I have a personal identity as a history-type person and that I am very comfortable reading texts within the discipline of history. I also have an identity as the kind of person who is a highly confident reader. Think about how these two identities intersect when

Figure 1.5. Example of a Disciplinary Literacy Profile



I am reading history texts and the likelihood that I would have a successful reading experience. I do not bring the same profile to my reading of science texts. Although I am still a highly confident reader, I am more of a science outsider and am less comfortable reading within the discipline of science. So, although I am receptive to learning about science, I may be less effective as a reader of science. Figure 1.6 displays the interplay between these two identities, with the arrow representing how they intersect for me personally. Where would you draw your arrow? Obviously, the most powerful scenario would be an arrow that extends straight across at the top, between "Is a highly confident reader" and "Is a science professional." The more your arrow dips downward one direction or the other, the more likely you will encounter struggles as a science reader. We could of course develop the same profile comparisons between reader identity and identity in any discipline (e.g., history, mathematics, literature, technical subjects). Where would many of our students draw their arrows, and what kinds of instruction would students need to support their success as readers in different disciplinary contexts?

Figure 1.6. Profile of a Science Reader



REFLECTION INTERLUDE

What is your disciplinary reader profile? Which disciplines are you most confident and accomplished in as a reader, and which are you least? Are there disciplines in which you do not feel that you are a particularly competent reader? Are there disciplines in which you would avoid reading if you could? Are there certain types of texts that you struggle with as a reader? Try your hand at creating your personal disciplinary literacy profile in Figure 1.7. Draw your “towers of literacy” that correspond to where you would place yourself as a reader in each of these disciplinary contexts.

Figure 1.7. What Is Your Profile as a Disciplinary Reader?

	Literary Fiction	Mathematics	Physical Science	Biological Science	History	Social Studies	Technical	Health & Fitness	Humanities
Highly Confident									
Generally Competent									
Can Get By									
Sometimes Struggles									
Often Struggles									
Avoids at All Costs									

The Need to Address Disciplinary Literacy

It is this third phase, disciplinary literacy, the goal of middle and high school literacy development, that is most neglected in our instruction. The RAND Corporation report on adolescent literacy (McCombs, Kirby, Barney, Darilek, & Magee, 2005) adopts deLeon's description of disciplinary literacy as an "orphaned responsibility" (p. iii); nobody takes care of it. As Shanahan and Shanahan (2008) conclude, "Although most students manage to master basic and even intermediate literacy skills, many never gain proficiency with the more advanced skills that would enable them to read challenging texts in science, history, literature, mathematics, or technology" (p. 45).

This concern about the lack of instruction at the disciplinary literacy level has been echoed again and again over the past decade by a series of influential research reports and policy documents. Historically, research investigations, policy initiatives, and public attention have targeted basic literacy instruction at the elementary school level. The prevailing attitude toward literacy development followed what some observers have termed an inoculation mentality: Provide excellent instruction to beginning readers, and they will be inoculated as readers, able to subsequently withstand increasingly more complex reading challenges without help or explicit teaching. The need to provide the necessary literacy instruction that supports students as readers and writers in academic disciplines was virtually ignored, as sporadic and short-lived efforts to teach reading in the content areas came and went. The decade since 2000 has witnessed an unprecedented shift in this attitude. As Frost, an advisor to the Clinton Administration's Department of Education, admits in the National School Boards Association (2006) policy statement on adolescent literacy, "We thought teaching every child to read well by the end of third grade would take care of the problem, but we were wrong" (p. 1).

“
The need to guide adolescents to advanced stages of literacy is not necessarily the result of any teaching or learning failure in the preschool or primary years; rather, it is a necessary next step in normal reading development.
”

—McCombs et al., 2005, pp. 2–3

A Shift Toward Disciplinary Literacy

Because disciplinary literacy has muddled along beneath the radar of public attention and policy concern, middle and high school teachers

might be surprised to learn about the avalanche of recent action documents with unambiguous recommendations that have been released and are currently influencing education decision makers. The voices are an amazingly diverse assemblage, but the conclusions in policy document after document are in striking agreement: Middle and high school teachers need to integrate literacy practices into the instruction of their disciplines (see Table 1.1). What is most remarkable is that few of these organizations had previously regarded disciplinary literacy to be a significant policy concern.

Table 1.1. U.S. Policy Statements on Adolescent Literacy

Organization	Policy Statement
American College Testing Program	"Not enough high school teachers are teaching reading skills or strategies and many students are victims of teachers' low expectations. Another likely reason that high school students are losing momentum in readiness for college-level reading is that reading is simply not taught much, if at all, during the high school years, not even in English courses." ^a
Alliance for Excellent Education	"The idea is not that content-area teachers should become reading and writing teachers, but rather they should emphasize the reading and writing practices that are specific to their subjects, so students are encouraged to read and write like historians, scientists, mathematicians, and other subject-area experts." ^b "All 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 (Pearson, 1996)." ^c
Carnegie Corporation of New York	"Because of this need for ongoing literacy development, adolescent students need explicit instruction in reading and writing all the way through grade 12, as well as comprehensive forms of assessment and rigorously aligned standards detailing what they need to know and what they must be able to do both <i>within</i> and <i>across</i> content areas." ^d

(continued)

Table 1.1. U.S. Policy Statements on Adolescent Literacy (Continued)

Organization	Policy Statement
International Reading Association, in collaboration with National Council of Teachers of English, National Council of Teachers of Mathematics, National Science Teachers Association, and National Council for the Social Studies	"Middle and high school teachers need help to understand how they can develop content knowledge at the same time that they improve student literacy; that in fact, effective teaching in their subject areas will be boosted by complementary literacy instruction related to the texts (and the other communication demands) characteristic of their subjects." ^e
National Association of Secondary School Principals	"It becomes even more critical that secondary content area teachers better understand and teach specific literacy strategies to help students read and extract meaning from the written material used to teach the course content." ^f
National Association of State Boards of Education	"The importance of connecting reading and writing across the curriculum has never been more clear. Indeed, comprehension instruction that promotes strategic behaviors to encourage active and purposeful reading and writing (something which most struggling readers have trouble) should not only be taught explicitly, it should be incorporated into content area teaching, beginning in the early grades and continuing through high school." ^g
National Center for Education Evaluation and Regional Assistance	"Adolescent literacy is a complex concept because it entails more than the scores that students achieve on standardized reading tests. It also entails reading to learn in subjects that present their ideas and content in different ways. Students need to be able to build knowledge by comprehending different kinds of texts, mastering new vocabulary, and sharing ideas with others." ^h
National Council of Teachers of English	"In middle and high school, students encounter academic discourses and disciplinary concepts in such fields as science, mathematics, and the social sciences that require different reading approaches...(Kucer, 2005). These new forms, purposes, and processing demands require that teachers show, demonstrate, and make visible to students how literacy operates within the academic disciplines (Keene & Zimmermann, 1997; Tovani, 2000)." ⁱ

(continued)

Table 1.1. U.S. Policy Statements on Adolescent Literacy (Continued)

Organization	Policy Statement
National Governors Association Center for Best Practices	"Students need instruction beyond third grade to learn...how to employ reading strategies to comprehend complex texts about specialized subject matter. All students need such instruction, not just those who are struggling readers and writers." ^j
National School Boards Association	On students who meet state proficiency standards in literacy: "They can read simple texts such as newspapers or instruction manuals, but often can't understand specialized or academic materials. Researchers say these students desperately need help comprehending academic language and often benefit dramatically from having literacy instruction embedded in courses ranging from physical education to calculus." ^k
RAND Reading Study Group	"Research has shown that many children who read at the third-grade level in grade 3 will not automatically become proficient comprehenders in later grades. Therefore, teachers must teach comprehension explicitly, beginning in the primary grades and continuing through high school." ^l

^aFrom *Reading Between the Lines: What the ACT Reveals About College Readiness in Reading* (p. 9), by ACT, 2006, Iowa City, IA: Author.

^bFrom *Reading Next—a Vision for Action and Research in Middle and High School Literacy: A Report to Carnegie Corporation of New York* (p. 15), by G. Biancarosa and C.E. Snow, 2004, Washington, DC: Alliance for Excellent Education.

^cFrom *Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement* (p. 27), by R. Heller and C.L. Greenleaf, 2007, Washington, DC: Alliance for Excellent Education.

^dFrom *Time to Act: An Agenda for Advancing Adolescent Literacy for College and Career Success* (p. 18), by Carnegie Council on Advancing Adolescent Literacy, 2010, New York: Carnegie Corporation of New York.

^eFrom *Standards for Middle and High School Literacy Coaches* (p. 2), by International Reading Association (with National Council of Teachers of English, National Council of Teachers of Mathematics, National Science Teachers Association, and National Council for the Social Studies), 2006, Newark, DE: Author.

^fFrom *Creating a Culture of Literacy: A Guide for Middle and High School Principals* (p. 1), by National Association of Secondary School Principals, 2005, Reston, VA: Author.

^gFrom *Reading at Risk: The State Response to the Crisis in Adolescent Literacy* (Rev. ed., p. 5), by National Association of State Boards of Education, 2006, Arlington, VA: Author.

^hFrom *Improving Adolescent Literacy: Effective Classroom and Intervention Practices: A Practice Guide* (NCEE 2008-4027, p. 6), by M.L. Kamil, G.D. Borman, J. Dole, C.C. Kral, T. Salinger, & J. Torgesen, 2008, Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

ⁱFrom *A Call to Action: What We Know About Adolescent Literacy and Ways to Support Teachers in Meeting Students' Needs* (para. 3), by National Council of Teachers of English, 2004, Urbana, IL: Author.

^jFrom *Reading to Achieve: A Governor's Guide to Adolescent Literacy* (p. 7), by National Governors Association Center for Best Practices, 2005, Washington, DC: Author.

^kFrom *The Next Chapter: A School Board Guide to Improving Adolescent Literacy* (p. 1), by National School Boards Association, 2006, Alexandria, VA: Author.

^lFrom *Reading for Understanding: Toward an R&D Program in Reading Comprehension* (p. xii), by C. Snow, 2002, Santa Monica, CA: RAND.

Middle and high school teachers tend to assume that if students have had adequate basic and intermediate literacy instruction, then they will automatically and on their own develop disciplinary literacy skills at that time when reading branches out into dramatically dissimilar texts during the learning of content subjects. Students are expected to comprehend texts dealing with complex concepts—and that are more abstract, ambiguous, and subtle—by applying sophisticated literacy skills that “are rarely taught” (T. Shanahan & Shanahan, 2008, p. 45). In its 2009 policy statement on adolescent literacy, the Southern Regional Education Board summarized these concerns:

Few teachers have been asked to teach the reading skills that students need in each subject. They consider themselves responsible for teaching their subjects only—not for teaching students reading skills. Some teachers in various subjects have resisted efforts to incorporate reading instruction into their courses for fear that they are being asked to become “reading teachers.” But asking a teacher to become a *reading teacher* is distinctly different from asking a teacher to *help students master texts within the teacher’s own field*.

In fact, subject-area teachers are best qualified to help their students master texts in each course. Subject-area teachers should not be expected to teach basic reading skills, but they can help students develop critical strategies and skills for reading texts in each subject. (p. 5)

The current Common Core State Standards Initiative reflects this significant shift in policy attention toward disciplinary literacy. A collaboration of the National Governors Association Center for Best Practices (NGACBP) and the Council of Chief State School Officers (CCSSO; 2010c), the Common Core State Standards for English Language Arts and Literacy were released in 2010 and adopted by the vast majority of states as their new state standards. For the first time, literacy expectations for teachers extend beyond solely English language arts. Emphasizing that the literacy development of students is a shared responsibility, the standards state,

Just as students must learn to read, write, speak, listen, and use language effectively in a variety of content areas, so too must the Standards specify the literacy skills and understandings required for college and career readiness in multiple disciplines. Literacy standards for grade 6 and above are predicated on teachers of ELA, history/social studies, science, and technical subjects using their content area expertise to help students meet the

particular challenges of reading, writing, speaking, listening, and language in their respective fields. (para. 5)

For the first time, 10 reading standards for instruction by social studies teachers are explicitly articulated in the Common Core State Standards for Literacy in History/Social Studies for grades 6–12. Teachers of science, mathematics, and other subjects also are provided with 10 reading standards in the Common Core State Standards for Literacy in Science and Technical Subjects for grades 6–12. In addition, the Common Core State Standards include 10 writing standards for instruction by teachers of history/social studies, science, and technical subjects for grades 6–12. (The Common Core State Standards are available at www.corestandards.org/the-standards.)

Literacy Performance of Adolescents

There is a wealth of dispiriting assessment data that reveals that adolescents are not continuing to grow their capacities as readers and writers as they move through the middle and high school curricula. The National Assessment of Educational Progress (NAEP) has tracked reading progress since 1971, and while performance by fourth graders has achieved steady and impressive gains during this time period, eighth graders have shown only slight gains, and 12th graders' scores have declined 4 points since 1992. The 2009 NAEP data (National Center for Education Statistics, 2010a, 2010b) are illustrative: About three quarters of all eighth graders were able to handle general comprehension tasks, such as locating information, identifying main ideas, making some inferences, and interpreting word meanings. However, only one third were able to perform at a proficient level involving more sophisticated disciplinary comprehension expectations, and only 3% scored advanced. The 2009 NAEP results for 12th graders showed only 5% scoring at advanced levels, able to read specialized and complex texts. International studies, which compare students in the United States with their international counterparts, confirm this alarming trend. Fourth-grade U.S. students performed among the best in the world, but eighth graders scored considerably lower, and 10th graders ranked among the lowest of the nations studied. As the Carnegie Council on Advancing Adolescent Literacy (2010) concludes,

During the last twenty years our nation's educational system has scored some extraordinary successes, especially in improving the reading and writing skills of young children. Yet the pace of literacy improvement has not kept up with the pace of growth in the global economy, and literacy gains have not been extended to adolescents in the secondary grades. (p. 1)

In an extensive and much-cited study, the American College Testing Program (2006a) reveals similarly disturbing results. It concludes that the longer students were in school, the more they lost ground developing disciplinary literacy:

Only 51 percent of 2005 ACT-tested high school graduates are ready for college-level reading—and, what's worse, more students are on track to being ready for college-level reading in eighth and tenth grade than are actually ready by the time they reach twelfth grade. (p. 1)

Particularly significant about the American College Testing Program analysis is the pinpointing of reading problems experienced by students beyond the basic and intermediate literacy levels and who have educational ambitions beyond high school. The report's lead recommendation is bluntly stated: "All courses in high school, not just English and social studies but mathematics and science as well, must challenge students to read and understand complex texts" (p. 23).

College Readiness

Finally, disciplinary literacy concerns are underscored by data on college readiness and success (Clark, 2009). Almost half of the 3 million people in the United States who start their first year of college will drop out before they earn their degree, and 30% will drop out after their first year. The problem is even more evident at the community college level, where out of 6 million students, 1 million will take remedial courses. Furthermore, college students who take remedial courses are highly likely to drop out. The College Board issued similarly disappointing findings in *The College Completion Agenda: 2010 Progress Report* (Lee & Rawls, 2010). The report notes that only 56% of students in the United States who enter institutions with the intention of earning a bachelor's degree persist to graduate in six years or less, and only 59% of those students entering a two-year college make it into their second year. Inadequate preparation is repeatedly cited as a central factor in the disappointing college success rates at two-year and four-year institutions.

The convergence of multiple, well-researched policy documents regarding adolescents and disciplinary literacy has dramatically shifted the landscape for middle and high school teachers. National, state, and local district conversations at these levels are transitioning from “what should teachers in the elementary grades be doing” to “what should we be doing.” Although it may feel somewhat unsettling that so many varied constituencies are now “talking about us,” it is also an opportunity to intensively explore effective practices for supporting and developing students as readers, writers, thinkers, and learners within our disciplines.

Apprenticing Readers, Writers, and Thinkers in Disciplinary Literacy

At this point, it would be useful to deconstruct the term *mentor* and examine how it can apply to instruction in disciplinary literacy. What images come to mind when you think of mentoring someone: an adult who is recruited to be a role model for youngsters in the community, an experienced hand who is assigned to be a mentor to a new employee, or an individual who is credited by a celebrity for providing help and encouragement on the way to the top? Who have been the significant mentors in your life?

For me, one person in particular stands out. Robert Hanson was the sawmill operator at a woodshop where I was employed for several summers during my college years. Although a sawmill was (at least for me) a fascinating place to spend my hours, my role as a tail sawer was quite unromantic. I was the person who guided the freshly sawed planks off the blade and onto the rollers and then lugged them to be stacked. I was the summer help who could be easily replaced. Robert was the craftsman.

As I worked alongside Robert, I observed him plying his trade. I learned how a master sawyer goes about his business: how to wield a cant hook, how to set the dogs into a log on the carriage, and how to feed boards into the edger. I could watch Robert’s actions, of course, but I would have had to infer what he might be thinking as he made his decisions. Luckily for me, Robert was a garrulous man, determined to share the fine art of sawing logs with anyone who cared to listen. He talked as he worked, but mainly he explained his thinking: how to figure

a series of cuts in advance to avoid waste, how to position a log for the most efficient first cut, and so forth. He would solve problems out loud and include me in the conversation. He would solicit my ideas and then provide feedback: why he would or would not act on my suggestions, what he would do instead, and why.

So, not only was I able to observe what a sawyer did, but I was also able to track the kind of thinking necessary to do this trade well. I realized that Robert had every cut figured even before a log hit the blade, had factored in exactly how much would be lost to sawdust each time the blade passed through a log, and had tallied in advance how many boards each log would yield. It may have seemed like magic to an onlooker, but Robert was a thinking man, and I was privileged to be treated like his apprentice.

After a couple summers, Robert would occasionally allow me to manipulate the controls and saw a log myself. It could be dangerous work, but he stood close by, offering supportive commentary and encouragement. Always, I would have to explain what I was planning and why. Also, when I had finished, we would always debrief. Maybe I would admit that my cuts resulted in too much waste that would be lost to the slab pile. Why, he would ask, did that happen? What had I misfigured or miscalculated? What should I have done differently?

Gradually, Robert ceded more opportunities to me to do some of the sawing. I might be allocated the last batch of logs of the day as my share, with Robert receding increasingly into the background. However, the conversation never ceased. We constantly conferred and always evaluated. Could I have gotten more out of that log? How might I have sawed it better?

The last summer I worked at the mill, I returned home from college to discover a new sawyer; Robert had moved on. The new man was injured in a mill mishap my first week on the job, leaving me as the only individual with any experience around a sawmill. The owner delegated me as the sawyer for that summer, a role I undertook with much trepidation. Yet, I soon discovered that the mentoring I had received over the years had positioned me, even though I had not realized it, as an individual capable of doing this work independently. So, I performed that summer as the sawyer, with Robert no longer nearby as my support and security blanket.

I have related this experience in some detail because the stages I went through as a learner were each significant and are often missing from our

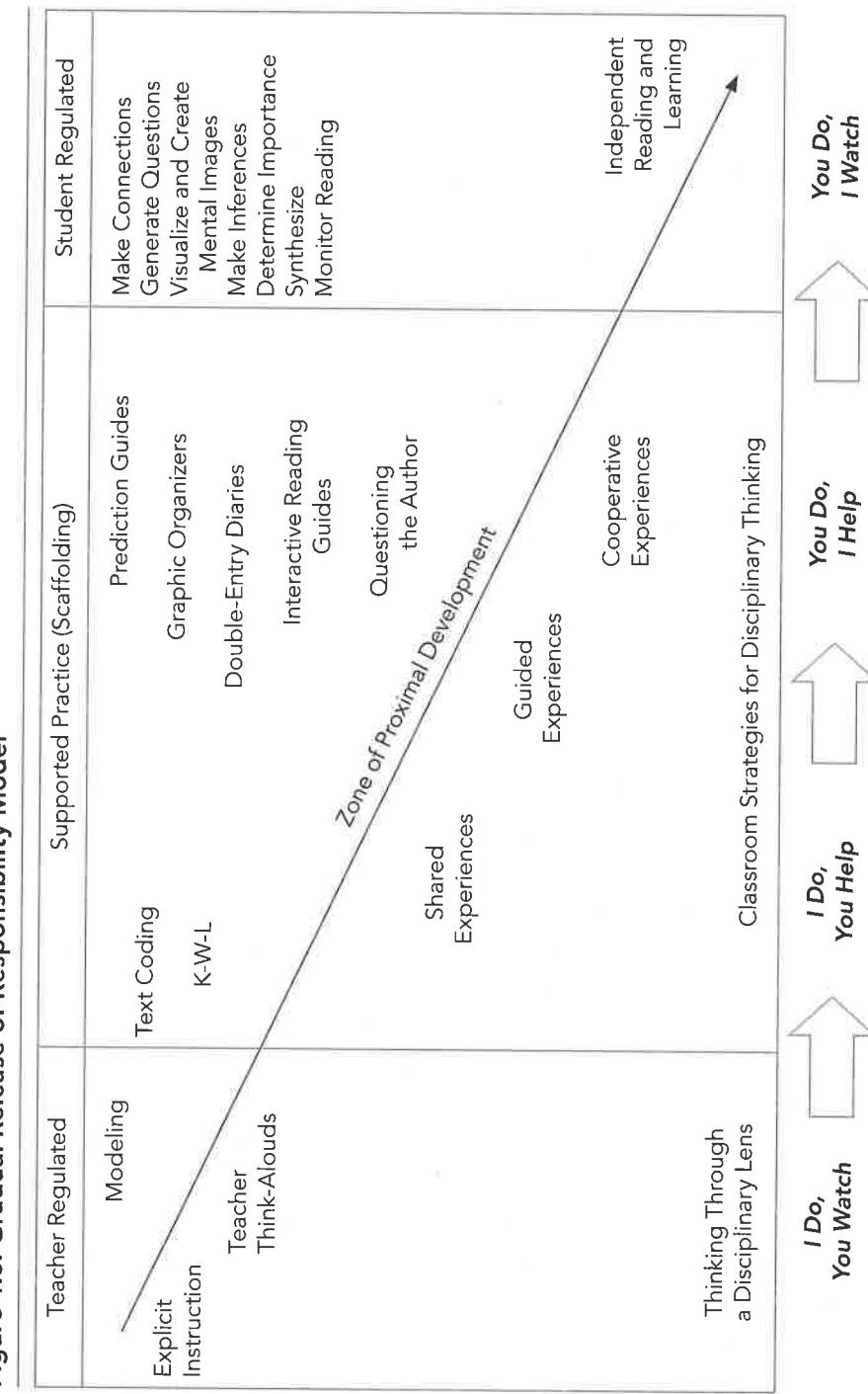
classroom instruction. Consider similar experiences that you have had in learning in the home, on the job, and while mastering a skill. Much of the most important learning that we have achieved in life—whether it is baking pastries, fishing for walleyes, driving a vehicle, learning to play a musical instrument, or throwing a pot on the wheel—has been in the role of apprentice to a master craftsman, an expert, an accomplished veteran. We learned by witnessing the expert engaged in an activity, we were invited to try our hand at doing it, and as we collaborated and received feedback on our performance, we gradually moved from novice status to independence. Notice how critical identity is to this process of growth. I could have easily assumed the identity of temporary employee. Instead, I was lifted to a different identity: apprentice sawyer. Each day, I was treated as the kind of person who is capable of doing this work alone. I am proud to say that in addition to all those identities I listed earlier in the chapter, I can add this one: sawyer.

Gradual Release of Responsibility

I realize now that during those summer days, under Robert's guidance and tutelage, I was being mentored in accordance with the classic model of learning theory attributed to the great Russian psychologist Vygotsky and articulated as the Gradual Release of Responsibility model by Pearson and Gallagher (1983). As you examine Figure 1.8, notice that the model envisions three phases of development, from a high-profile teaching phase, through an extended period of supported practice, to eventual independence with the student in charge. This model outlines an apprenticeship dynamic to literacy instruction (Schoenbach, Greenleaf, Cziko, & Hurwitz, 1999).

Modeling. The teacher-regulated phase assumes that many students do not know what doing a specific task well looks like, and they need explicit instruction to guide their thinking. For the purposes of this book, we are talking about what it means to read, write, and think through a disciplinary lens. This phase of mentoring means that students are provided with modeling and access to how experts think in order to build their own mental models of disciplinary thinking. When a history teacher engages in a think-aloud that talks through how historians interact with an author as they read, say, a primary document, the teacher is letting

Figure 1.8. Gradual Release of Responsibility Model



Note. Parts of this figure adapted from Strategic Reading: Guiding Students to Lifelong Literacy 6-12, by J.D. Wilhelm, T.N. Baker, and J. Dube, 2001, Portsmouth, NH: Boynton/Cook. Adapted from Classroom Strategies for Interactive Learning (3rd ed., p. 9), by D. Buehl, 2009, Newark, DE: International Reading Association.

the students in on the secret, so to speak, of reading through a historian lens. When a mathematics teacher thinks out loud about how to carefully deconstruct sentences on a page of a geometry textbook, the teacher is demonstrating reading through a mathematics lens. When an English teacher publicly grapples with understanding a poem, the teacher is modeling reading through a literary lens. The most profound facet of this model is that students have access to something they cannot readily observe: thinking.

Teachers, of course, recognize this phase and will likely comment, “We already do this.” Of course, we will find elements of such explicit instruction in many forms in classrooms, but we will rarely find it connected to mentoring students as readers and writers in disciplinary contexts. Students are given reading and writing assignments not reading and writing instruction. Again, the prevailing assumption tends to be that instruction from previous years is sufficient for students who must adjust to new disciplinary reading, writing, and thinking demands.

Scaffolding. The supported practice phase engages students in test-driving this thinking as they confront tasks of a discipline. This phase assumes that many students will not be particularly good at the task and that they will need extended practice, lots of support, and feedback from the expert and, most important, collaborators. Most of us prefer to have the assistance of others when we are doing something that we do not yet do well, especially when we might fumble around at times, fail perhaps regularly, and experience frustration and confusion. During this supported phase of learning, students need to be frequently granted what television quiz shows sometimes call a lifeline, someone students can work with as they try to resolve a challenging situation. Again, teachers will recognize this practice phase and note that “this is what homework is for.” However, homework is predicated on independent behavior; when students are asked to independently do a task when they are not yet accomplished, they will likely fail. Of course, some students do have lifelines at home: parents, siblings, or friends who can help with homework that the students have not yet developed the ability to accomplish independently. Yet many of our students do not have access to such homework lifelines in their out-of-school lives.

This middle phase is where literacy strategies come into play. Researchers refer to these strategies as scaffolding: temporary instructional supports that guide students in their thinking as they strive to build their competency. The research is emphatic on this point: Students are not provided with adequate instructional scaffolds when they read disciplinary texts. When such texts are assigned, students are usually on their own and usually expected to read on their own outside of school and without support and feedback. Students are rarely engaged with collaborators as readers and writers, teamed to solve problems together to make sense of challenging disciplinary texts. Although we frequently conceptualize reading as a solitary act, researchers are increasingly examining the critical role that dialogue between students and also with the teacher plays in reading comprehension (Wilkinson & Son, 2011). Hence, an essential facet of scaffolding is fostering productive classroom student collaborations (Frey, Fisher, & Everlove, 2009). Vygotsky (1978) terms the scaffolding phase of learning as the zone of proximal development. Teaching in the zone is often the missing link in mentoring students as readers, writers, and thinkers through various disciplinary lenses in middle and high school classrooms.

Independent Reading and Learning. The third student-regulated phase, independence, is the condition that many middle and high school teachers expect: students who will arrive already able to read disciplinary texts independently. This phase involves readers confidently applying the fundamental processes of comprehension, which is discussed more thoroughly in Chapter 2. Many of our students, even those who have achieved basic and intermediate literacy, do not develop independence in reading disciplinary texts, not because these students are incapable but because they never received the appropriate instruction from appropriate mentors—disciplinary experts, the teachers who are accomplished readers, writers, and thinkers through their chosen disciplinary lenses.

PARTING THOUGHTS AND TALKING POINTS

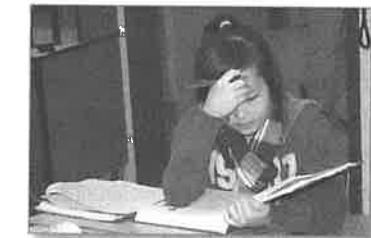
- Disciplinary literacy refocuses attention at the middle and high school levels from “how well do you read?” to “what are you able to read well?”

- Teachers need to invite their students to expand the identities they bring to the classroom to include academic and specific disciplinary identities.
- Mentoring students as readers, writers, and thinkers is an integral and essential component of instruction within a discipline, enabling students to become increasingly more independent in accessing the communications of different academic disciplines.
- Disciplinary literacy instruction, embedded into the daily flow of the teaching of an academic subject, develops students' capacities to adjust their reading and writing so that they can engage an expanding array of different disciplinary lenses for thinking and comprehending.
- Disciplinary literacy is perhaps in many respects a reconceptualization of what it means to teach an academic subject. Disciplines are organized ways of thinking about the world, and learning within a discipline involves more than becoming merely knowledgeable. Learning must also encompass how scientists, mathematicians, historians, and others read, write, and think. This is the difference between covering a subject and teaching a discipline.

CHAPTER 2

Teaching Comprehension With Complex Texts

Essential Question: What does it mean to read, write, and think through a disciplinary lens?



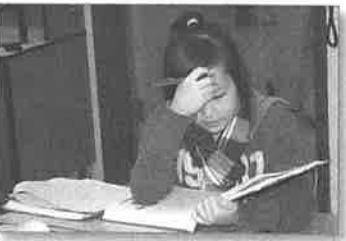
Let me get a read on it." How often has this phrase slipped into your conversation or thinking? Consider for a moment all the different situations in which you might try to get a read: how well your spouse appreciated a birthday gift; what exactly your principal or superintendent is up to; whether spring is finally here, and it is safe to plant your garden; whether you can squeeze another year out of driving your car before trading it in; which route would be the best option to avoid heavy traffic; how fit your body is for a 10-mile hike in the state park; how entertaining a particular movie will be; or which high-definition television best suits your needs and budget. Arguably, we are getting reads on something almost constantly. Reading is a very common human enterprise.

Later in the year, I ask my students at Madison East High School what the first thing was that they read when they entered my classroom back on that opening day of the semester. Some offer that it was the course syllabus, stacked on the table by the door waiting to greet them. Others are sure that it was the day's outline of activities, scrawled in my somewhat passable handwriting on the board. A few suggest some of the environmental print displayed about the room on the walls: posters, signs, and bulletin board items. A couple speculate that it was the covers of class texts, piled in front on my desk. No one ever mentions a first read that did not have something to do with the written word.

After the students have their say, I argue that the first read I saw most of them make was the class itself. As they walked into the room, they quickly did a read of the physical environment, sizing up how pleasant a setting this would be to spend time within and also getting a read on

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Let me get a read on it.” How often has this phrase slipped into your conversation or thinking? Consider for a moment all the different situations in which you might try to get a read: how well your spouse appreciated a birthday gift; what exactly your principal or superintendent is up to; whether spring is finally here, and it is safe to plant your garden; whether you can squeeze another year out of driving your car before trading it in; which route would be the best option to avoid heavy traffic; how fit your body is for a 10-mile hike in the state park; how entertaining a particular movie will be; or which high-definition television best suits your needs and budget. Arguably, we are getting reads on something almost constantly. Reading is a very common human enterprise.

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where they would be comfortable sitting. Almost simultaneously, they were doing a read on their classmates: Who else is taking this course? Who do I know in here? Who will be annoying? Who will be fun? What will it be like learning amid these fellow students? Of course, they also immediately got right down to the business of reading me, their teacher: What is this person like? How enjoyable will he be to work with? How demanding will he be? Does he seem to know what he is doing? Does he seem to have a sense of humor? How will I get along with him? Undoubtedly, that first day they were reading the course, too: Will I be successful in this class? How challenging will class expectations be? What will the daily workload be? How useful will this class be for me?

My point is not to trick my students or play semantic games. Instead, I want to emphasize what it truly means to read. Typically, we associate reading with the process of interacting with written language, deciphering the words on a page, and that mental translation we do to transform symbolic representations into a message from another person. Yet, in its larger usage, reading is what we do to make sense, to understand. We examine relevant information, think about what it might mean, decide on our understanding, and act accordingly. Ultimately, the goal of any act of reading is comprehension.

Comprehension Processes of Proficient Readers

However, it can become easy for students, and sometimes for their teachers, to lose sight of comprehension as the central purpose of reading. As students become immersed in the daily pipeline of school expectations, they may come to regard academic reading as merely completing assignments, looking over textbooks and other materials to fill out worksheets and answer questions, finding information to write down and study for tests. Unfortunately, the routines associated with middle and high school reading may replace the intention of reading in academic disciplines: comprehension may replace the intention of reading in academic disciplines: comprehension of new concepts and ideas. As a result, many students *do* reading to get work done rather than *engage* in reading to understand.

Pseudoreading

Students who do reading frequently resort to behaviors that might be described as pseudoreading rather than reading for comprehension.

Teachers can readily spot students merely doing reading in the following classroom instances that are all too familiar (Buehl, 2009a).

Skimming for Answers. Students do not actually read the material at all but embark on a very superficial skim, searching for information that might qualify as acceptable answers to assigned questions. Although this is an efficient way to get work completed, skimming for answers has little to do with comprehension, and students frequently hand in written work that seems appropriate. However, in fact, they have not necessarily understood, or certainly learned, the content. Students who skim for answers frequently observe, "I don't have trouble with homework. I just have trouble with tests."

Surface Processing. Students read the material, or at least their eyes are indeed fixing on the words on the page. Yet they are not really thinking about what an author is saying. They may read an entire section and have little idea what it was about when they have finished. They were instructed to read it, so they dutifully did but not with a focus on comprehension. Their minds may have been drifting off to other topics while their eyes moved along, and sometimes they cannot recollect even seeing a paragraph they have just read. Students who do surface processing rely on their teachers to tell them what they need to know, commenting that "I read it, but I didn't understand it."

Reading and Forgetting. Students read, but they read to get done. They may regard the material as boring or difficult, but because they are not invested with truly understanding what an author is saying, they gain little from their reading. They do not engage with the kind of inner conversation with an author that involves a deeper processing of the material. They know that teacher presentations, classroom discussions, and other activities will fill in the gaps, so students accept a hazy and hurried trip through a text. They typically admit, "I read it, but I don't remember it."

Contrast these school-reading behaviors with the kind of thinking you do when you are immersed in reading comprehension. Suppose you chanced upon an article describing the 2010 volcano in Iceland that disrupted European air travel for a period of time. The photograph of

the giant, billowing plumes of gray ash captures your curiosity, and you begin reading. Almost immediately, you may be reminded of events like the Mount St. Helens explosion in the Western United States and make mental comparisons of what you remember with details provided by the author. You wonder about the extent of the damage caused by the eruption and its impact on people, animals, and the terrain. The author addresses some of your questions while new ones surface, like why is there fluorine in the volcanic gases, and how deadly are these vapors. You find yourself imagining what local people were experiencing, with thick layers of black ash blanketing their countryside, their homes, their vehicles, and all the surrounding vegetation. You form a vivid mental picture of the glowing, red lava oozing from the volcanic fissures. Some segments you glance over quickly as of lesser importance to you, and you do not dwell on unfamiliar language, like the volcano's name, Eyjafjallajokull. Other portions you read more intently, especially details that relate to the extensive damage to bridges, roads, and local livestock, which relates to effects about which you were inquisitive. Author references to the melting of glacial ice, and information you can recall about Iceland in general, aid you in speculating about the climate in this area. Although the author does not mention it, you have a hunch that this landscape will be significantly altered for years to come. When you have completed the article, you ponder a few moments about what you have gained from your reading, and perhaps you carry on your thoughts later in the day in conversations with others.

What I have just described may seem like a commonplace reading experience for you, but such a thoughtful engagement while reading academic texts is not necessarily the norm in our classrooms. Instead, teachers witness the pseudoreading behaviors described earlier. Comprehension does not result from pseudoreading, and students do not develop the capacity to learn from disciplinary texts.

Seven Fundamental Comprehension Processes

Over 30 years of intensive research on reading comprehension has resulted in the identification of the characteristic modes of thinking that when bundled together during engagement with a text, result in comprehension. Literacy authorities such as Keene and Zimmermann (2007) have distilled from this research seven fundamental comprehension processes (see Table 2.1):

Table 2.1. Comprehension Processes Characteristic of Proficient Readers

Make Connections to Prior Knowledge	Reading comprehension results when readers can match what they already know (their schema) with new information and ideas in a text. Proficient readers activate prior knowledge before, during, and after reading, and they constantly evaluate how a text enhances or alters their previous understandings.
Generate Questions	Comprehension is, to a significant degree, a process of inquiry. Proficient readers pose questions to themselves as they read. Asking questions is the art of carrying on an inner conversation with an author, as well as an internal dialogue within one's self.
Visualize and Create Sensory Mental Images	Comprehension involves breathing life experiences into the abstract language of written texts. Proficient readers use visual, auditory, and other sensory connections to create mental images of an author's message.
Make Inferences	Much of what is to be understood in a text must be inferred. Authors rely on readers to contribute to a text's meaning by linking their background knowledge to information in the text. In addition to acknowledging explicitly stated messages, proficient readers read between the lines to discern implicit meanings, make predictions, and read with a critical eye.
Determine Importance	Our memories quickly overload unless we can pare down a text to its essential ideas. Texts contain key ideas and concepts amid much background detail. Proficient readers strive to differentiate key ideas, themes, and information from details so that they are not overwhelmed by facts.
Synthesize	Proficient readers glean the essence of a text (determine importance) and organize these ideas into coherent summaries of meaning. Effective comprehension leads to new learning and the development of new schema (background knowledge). Proficient readers make evaluations, construct generalizations, and draw conclusions from a text.
Monitor Reading and Apply Fix-Up Strategies	Proficient readers watch themselves as they read and expect to make adjustments in their strategies to ensure that they are able to achieve a satisfactory understanding of a text.

Note. From Buehl, D. (2007). A professional development framework for embedding comprehension instruction into content classrooms. In J. Lewis & G. Moorman (Eds.), *Adolescent literacy instruction: Policies and promising practices* (p. 200). Newark, DE: International Reading Association.

You will notice that each of these modes of thinking was employed during our Iceland volcano example. When our comprehension falters, it is likely that one or more of these modes of thinking are not clicking for us.

REFLECTION INTERLUDE

Pause for a moment to consider a text that you have recently read and analyze your thinking. How did each of these seven modes of thinking surface as facets of your comprehension? As you deconstruct your reading, try to identify an instance when you engaged in each comprehension process described in Table 2.1 (see Figure 2.1).

Figure 2.1. Analyzing Your Thinking While Reading

I noticed myself...	When I...
Making connections to prior knowledge	
Generating questions	
Visualizing and creating sensory mental images	
Making inferences	
Determining importance	
Synthesizing	
Monitoring reading	

The challenge for middle and high school teachers is to plan instruction that elicits and supports these seven fundamental

comprehension processes. It may be tempting for teachers to adopt a rather fatalistic attitude toward reading comprehension: There isn't much we can do about it; it is inevitable that some of our students are going to get it and some are not. After all, teachers ask, we cannot really teach students how to comprehend, can we? To the contrary, research has provided teachers with an unequivocally affirmative answer: Yes, we can indeed teach comprehension. In the *Handbook of Research on Reading Comprehension*, renowned researcher Pearson (2009) summarizes two consistent findings from the deep vein of research on comprehension strategy instruction, noting that "when students are taught to apply strategies to text, their comprehension of those texts improves" (p. 21), and their ability to transfer those strategies to their comprehension of new texts can also improve. In other words, comprehension instruction leads to improved learning from current texts and builds the capacity to learn independently from future texts.

Current practices in content classrooms tend to focus on assigning reading and assessing performance but not teaching comprehension. A frequently heard complaint from teachers is "Shouldn't we be able to expect students to be effective readers of our materials by the time they enter middle and high school?" Chapter 1 outlined a different expectation for middle and high school students: the need for disciplinary literacy instruction as they advance into reading more complex and varied texts. A key component of this instruction involves the embedding of comprehension development into the daily classroom routines of learning content and reading disciplinary texts. As Wilkinson and Son (2011) observe in their analysis of comprehension instruction in Volume 4 of the *Handbook of Reading Research*, "strategies provide the tools to help students make sense of the content, and the content gives meaning and purpose to the strategies" (p. 367).

The Nature of Complex Texts

I use the term *text* frequently in this book, and it is probably time to pause and elaborate on exactly what qualifies as a text. I opened this chapter with a discussion about reading in a very general sense: the examination of some sort of relevant input to arrive at a desired comprehension.

Anything that we read might be considered a text in this general sense, such as a human face, a gesture, a landscape, an athletic formation, an interaction, a telephone conversation, a painting, a movie, a musical composition, and of course, written language.

In addition, texts that use written language could be relatively informal (e.g., a text message, a note, an e-mail, a list, a personal letter, a blog comment, a Facebook posting, a wall of graffiti) or more formal (e.g., a novel, a textbook, a scholarly article, a newspaper analysis, a magazine story, a poem, a proposal, a set of instructions, an advertisement, a legal document, a recipe, a website page, a set of song lyrics). Certainly, in our classrooms, students interact with a broad range of sources of information, including visual media, hands-on experiences, class presentations, lectures, online resources, software applications, and field trips. For the purposes of this book, text will be used in the narrower sense, to refer to written language that can be used in academic settings. Of course, text should not be merely construed as textbook. Obviously, students interact with many formats and genres of written language, both conventional print and hypertexts, as they learn within an academic discipline. Furthermore, written language may exist in texts that include multiple modalities of information that contribute to the communication of a message, especially with hypertexts.

In our discussion of disciplinary literacy in Chapter 1, we noted that as students advance through their years of schooling, they encounter increasingly more complex texts. The Common

“
The challenge of teaching reading comprehension is heightened in the current educational era because all students are expected to read more text and more complex texts.
”
—Snow, 2002, p. 15

Core State Standards (NGACBP & CCSSO, 2010c) are predicated on students systematically gaining the capacity to independently and proficiently comprehend complex texts that are typical of college and careers. Just what is meant by a complex text? The American College Testing Program (2006a) outlines the following six characteristics of disciplinary texts that increase complexity for readers. As you examine each element of text complexity, consider how texts in your discipline exhibit these features.

REFLECTION INTERLUDE

What constitutes a written text in your discipline? What types of written text does a literate person need to have the capacity to read in your academic discipline? What are the various texts that students are expected to read, or could be reading, to access knowledge and understanding in your subject? (See Figure 2.2.) Extend your thinking to beyond the textbook.

Figure 2.2. What Constitutes a Written Text in Your Discipline?

Texts That Insiders in My Discipline Read	Texts That Students Could Read for Learning in My Discipline

Text Relationships

The relationships between ideas in informational texts or between characters in literary fiction become less basic and straightforward. Readers increasingly have to identify relationships that are implicit, sometimes subtle, more involved, and deeply embedded in the message rather than overtly presented. Consequently, complex texts place a greater load on the readers' abilities to make inferences and construct a meaning that is not always directly stated. In addition, complex texts may present multiple themes, multiple perspectives, or perspectives that are significantly unlike or even in opposition to those held by many readers.

Richness of Detail

As texts gain in complexity, more depth of background detail and conceptual information is provided. Readers have to navigate considerable and sometimes highly sophisticated material to construct an understanding. In addition, complex texts increasingly display information in multiple visual forms and graphic representations, requiring readers to move back and forth from prose language to sometimes elaborate visual displays, which must be examined and then synthesized into an overall understanding. In other words, such texts should perhaps be stamped, "Some assembly required for comprehension!"

Complex texts also exhibit higher intertextuality: Readers are expected to meaningfully connect to references and allusions to other texts or knowledge. Complex texts are likely to be more lengthy and demand more reader decisions on what are essential ideas and what are supportive details.

Text Structure

The way that ideas and information are organized becomes more elaborate and perhaps less conventional. Awareness of text structure and the ability to track how authors develop explanations, arguments, and ideas becomes a central facet of comprehension of complex texts.

Students must transition from texts that explicitly signal text structure to texts requiring a reader to recognize without being directly informed, for example, that a cause–effect organizational pattern is being followed. More than a single logical relationship between ideas might be present (e.g., an author might use argumentation, comparison, and causal developments all in the same section). Literary texts may adopt less straightforward methods of storytelling, such as unreliable narrators, and narration of events out of chronological order.

Writing Style

Complex texts feature more intricate writing styles. Certainly, such texts will offer fewer simple sentences and employ more lengthy and elaborate sentence structures, with subordinate clauses and extensive punctuation. Readers also need to track key connective language, like *but*, *however*, *therefore*, *such as*, and *consequently*, as they attempt to parse sentences that have a number of turns and signposts embedded in the language.

In addition, readers need to be sensitive to the author's tone as well as explicit statements and notice how the author's use of language and word choice influences an understanding of a particular text. For example, language might be figurative or ironic in tone, requiring readers to pick up undercurrents of meaning that are not literal. Also, writing styles may not mirror contemporary or familiar conventions.

Vocabulary Density

Clearly, a major facet of text complexity is the increase in challenging vocabulary. Complex texts strive for more precision and clarity in use of language, and as a result, they rely less on general conversational talk and more on academic discourse. Readers can expect to encounter unfamiliar words with greater frequency, especially disciplinary vocabulary that can be highly technical and is employed primarily within the context of learning the concepts of a discipline. Students are asked to read words in science, for example, that they will rarely meet outside of science contexts.

Author Purpose

Finally, complex texts may mandate that readers infer the author's purpose and intentions for writing the text. Such purposes may be clearly articulated sometimes but may be more ambiguous at other junctures. Or, there may be multiple purposes, some stated and some not. Furthermore, textbooks are generally written by hidden authors, as it may not be apparent who in actuality wrote various sections or chapters, which complicates the task of determining author intent. The conceptual load presented to readers becomes increasingly abstract and assumes deeper and more sophisticated disciplinary knowledge and reliance on previous learning. Ultimately, readers must determine "Why is the author telling me this?"

After examining the nature of complex texts, it might appear reasonable for teachers to decide to spare their students the frustrations of learning from these more challenging materials. Indeed, in their research synthesis on the role of text in disciplinary learning, Wade and Moje (2000) conclude that "students engage in little reading of any kind of published text, either in class or as homework" (p. 613) and that students rely predominantly

on teacher telling and explanation for their learning of new content. If assigned, complex texts were frequently read to students, either by the teacher or through round-robin oral reading—an exercise in listening comprehension not reading comprehension. As a result, even students who have achieved basic and intermediate literacy abilities remain stalled as readers and do not develop the capacity to independently access the range of complex texts central to the communication of disciplinary knowledge.

In the NGACBP and CCSSO's (2010a) extensive review of the research on text complexity, the Common Core State Standards emphatically rebut the practice of reading avoidance in content learning:

Being able to read complex text independently and proficiently is essential for high achievement in college and the workplace and important in numerous life tasks. Moreover, current trends suggest that if students cannot read challenging texts with understanding—if they have not developed the skill, concentration, and stamina to read such texts—they will read less in general. In particular, if students cannot read complex expository text to gain information, they will likely turn to text-free or text-light sources, such as video, podcasts, and tweets. These sources, while not without value, cannot capture the nuance, subtlety, depth, or breadth of ideas developed through complex text. (p. 4)

Talking the Talk of an Academic Discipline

Let me provide an example of a complex text that I faced as an adult reader. My wife Wendy, who is a classical violinist and middle school orchestra teacher, enjoys Renaissance music and a couple of years ago purchased a compact disc featuring several selections from this time period. Like many listeners, I picked up the CD booklet and referred to the liner notes in an effort to more deeply understand this music I was listening to. The following is a segment of those liner notes:

One is always surprised to observe how Western music has for so long been divided into two areas of activity, so far removed from one another: learned vocal polyphony on the one hand and the instrumental playing of minstrels on the other. These two categories of musician did not belong to the same environment; they were contrasted in their very different social status as well as in their mentalities and divergent techniques....the *Musique de Ioye* marks an interesting stage, for it places in the hands of all instrumentalists, professional or not, on the one hand refined and complex works by the

greatest Venetian masters and, on the other, rudimentary but vividly coloured pieces by anonymous composers. Within the same publication two musical mentalities come face to face, and so were led to gradually transform each other. It is here that we find the beginnings of the prodigious flourishing of the art of Western instrumental music, the point at which a rapprochement was reached between learned composers principally writing complex contrapuntal works for vocal groups, and the practical experience of the minstrels, nourished on the techniques of ornamentation and improvisation and concerned with particular instrumental combinations. (Musique de Ioye, 1987, para. 1)

Whew! Clearly, this text exemplifies all six of the elements of complex texts that were outlined previously. In particular, it is densely packed with information, follows multiple text structures (e.g., compare and contrast, explanation, concept development), features very complicated sentence structures, and employs sophisticated vocabulary and unfamiliar terminology. Like many of you, I suspect, I found this to be a challenging text to comprehend. I had to read carefully and methodically, stopping frequently to ponder what the author was saying, and I reread some segments multiple times. Even then, I realized I was obtaining only an incomplete understanding.

However, Wendy found the liner notes to be a relatively comfortable reading experience. Interesting, although we are both strong readers and get plenty of daily practice reading texts that exhibit complexity, we were not equally proficient as readers of this complex text. In Chapter 1, we examined how identities influence reader profiles. One of Wendy's significant identities is musician, and unsurprisingly, she is a much superior reader through a musical lens than I am. Of course, we could isolate the insider language as a major impediment to my understanding. The liner notes are written in musicianspeak; orchestral players, composers, conductors, and people who study the classical repertoire would qualify as music insiders, and very likely, they are the intended audience of this text. These individuals can talk the talk of classical music, but the rest of us are outsiders of what Gee (1996) terms a *Discourse*, an accepted use of language that typically employs a prescribed pool of vocabulary. When Wendy reads through a musical lens, she is in effect demonstrating her capacity to read the discourse of classical music. She not only can read the symbolic notation arrayed on a sheet of music while

performing on her instrument, but she can also read complex written texts that talk about music.

Discourse Insiders

Insiders in a discourse bring much more to reading than the recognition of meanings of the specialized words used to describe concepts, items, and procedures in their field. Over time, insiders have developed deep knowledge and logged extensive experiences that allow them to make numerous personal connections when reading within a familiar discourse. A musician like Wendy reading the Renaissance music liner notes has immediate understanding of rare terms like *polyphony* and *contrapuntal* and realizes that general words like *ornamentation*, *improvisation*, and *coloured* have very specific meanings in musical contexts. Yet she can also engage her imagination to actually hear what the author is describing. She has personally performed pieces that exhibit these musical properties, and she has previously learned a great deal about this musical genre. As she read, Wendy had accompanying music playing in her head, so to speak, whereas I would have to play the CD to have any chance of relating the author's words to a musical interpretation. Even then, I would not really know what exactly I should be listening for or how some facet of what I was hearing exhibited characteristics described as contrapuntal, ornamental, or polyphonic.

Communities of Insiders

Wendy and other music insiders can be seen as a community of individuals who are comfortable with the discourse of classical music. Any group of people who share a specific identity can be described as a discourse community. These people operate from a common knowledge base, draw on a shared set of experiences and beliefs, and are expected to adhere to accepted ways of interacting when assuming that identity.

A discourse community helps define the persona for a particular identity. Doctors, for example, are a discourse community, a group of people who share an identity, employ a common vocabulary, have comparable training, relate to similar experiences, display a certain outlook, and conform to expected types of deportment when acting as doctors. Lawyers, accountants, pharmacists, electricians, civil engineers, baseball players, automobile mechanics, computer programmers, classical

musicians—all display the qualities of discourse communities. If you are a member, you know how to talk and how to act.

If you are not a member, however, you can quickly find the talk of a discourse unintelligible, aggravating, and even marginalizing. You may resent that people are communicating to you in a language that makes little sense, or you may make minimal effort to comprehend. You know full well that you are an outsider in that conversation with shop mechanics about repairing your automobile, with hockey enthusiasts as they comment about the events of a Stanley Cup matchup, with video players extolling the merits of various games, or with culinary experts swapping recipe combinations and techniques. You may have decided it was not worth it to you to really try to dig out an understanding of the liner notes passage provided at the beginning of this section. Indeed, you may have uttered the classic cry of frustration of the discourse outsider: "Why can't they just say this in English?" You may denigrate insider vocabulary as jargon. You may even regard folks who ensnare you in unfamiliar discourse as snobs who are trying to exclude others through their use of insider language. You may also find it irritating that I am using literacy discourse terminology like *discourse* in writing this section.

Identity and Discourse

Of course, all of us talk some forms of insider talk. Each of us is comfortable putting into play a variety of discourses. Our identities qualify us as members of a host of formal and informal groupings, from our immediate family, to associations that coincide with our interests, to our daily professional exchanges. People who have the identity of teachers are a discourse community. We can talk the talk of the education profession, and sometimes parents, who have outsider identities, feel we are speaking in a language that leaves them left out. Yet, we may share other identities with these same parents, enabling us to shift into a discourse that reflects a common ground. However, if we share no identities, then we are likely to have difficulty communicating with each other.

People who are insiders in many discourses become flexible in using and accessing language; we can code-switch, smoothly transitioning from one discourse to another. The specific discourse that we choose at any given moment depends on who is receiving our talk and the conditions of our interaction. A basketball coach, for example, engages in one type of

discourse when conducting a workout with the team, a different discourse when conferring with an insurance representative, and a third when visiting a grandparent.

We also can quickly judge the appropriate discourse for a specific context. The discourse that you might use when casually talking with a group of close friends might contain language, references, and behavior that while tacitly agreed on as acceptable for your interactions with each other, would be highly inappropriate in other contexts, such as teaching a group of middle school students, chatting with the pastor of a church, or addressing the school board on live public access television. We can talk the talk, and we know when to talk it.

REFLECTION INTERLUDE

Take a moment and jot down a list of discourses for which you feel you would qualify as an insider (see Figure 2.3). When you get together with fellow members of these communities, you can hold your own in the conversation and are comfortable engaging in the groupspeak. A list for my father, for example, would include discourses based on identities such as dairy farmer, agricultural seed salesman, town board member, sportsman, amateur wine maker, Medicare recipient, and Wisconsin history enthusiast.

Then, jot down a list of texts that you read featuring your insider discourses. Which of these texts might be particularly troublesome for outsiders?

Figure 2.3. Are You a Discourse Insider?

My Insider Discourses	Texts I Read That Feature This Discourse

Complex Texts in Academic Disciplines

Discourse is a key concept in understanding disciplinary literacy. Not only do texts that students read in middle and high school increase in complexity, but also the types of texts begin to vary a great deal across the different academic disciplines. Certainly, adolescents are expected to read a wider range of text genres: textbooks, novels, short stories, newspaper and magazine articles, Internet sources, essays, primary documents, biographies and autobiographies, technical materials, and more. Yet, the specific texts that students read to access disciplinary knowledge are also markedly different from each other. As the Carnegie Council on Advancing Adolescent Literacy (2010) observes,

Each content area in middle and high school demands a different approach to reading, writing, and thinking. Texts read in history class are different from those read in biology, which in turn are substantially different from novels, poems, or essays read in English language arts. (p. 13)

Do readers read texts of one academic discipline in ways that are substantially different from the texts of other disciplines? In Chapter 1, I referred to reading, writing, and thinking through a disciplinary lens. How is reading through a historian lens different from, say, reading through a scientific lens, a mathematics lens, or a musical lens? To address this question, we next take an introductory excursion through the world of a reader who is confronted with a typical ninth-grade curriculum.

If we delved into the overstuffed backpack of a high school freshman, what types of texts might we discover? Perhaps a biology textbook emerges first. As we quickly flip through it, our eyes settle on the following page: “Characteristics of Protists” (see Figure 2.4). Notice first the visual layout. About half the page is flowing text (three paragraphs and a caption), with the other half partitioned into visuals (a photograph and an illustration) and study support (key ideas, key terms, why it matters, and a reading check). A boldface statement stands out: “Protists are eukaryotic organisms that cannot be classified as fungi, plants, or animals.” The section is very descriptive and packed with detailed information and biological terminology.

Next, we might lift out a U.S. history textbook, and thumbing through it, we end on a page entitled “The Drive for Reform” (see Figure 2.5). Again, the page is divided between flowing text (three paragraphs, a caption, and

Figure 2.4. Biology Textbook Page

Section 1 Characteristics of Protists

Key Ideas	Key Terms	Why It Matters
<ul style="list-style-type: none"> What types of organisms are classified as protists? What methods of reproduction do protists use? Why is the classification of protists likely to change in the future? 	gamete zygote zygosporangium alternation of generations	Protists offer clues about the evolution of fungi, plants, and animals.

From tiny glass stars that float in the ocean to slimy green fuzz that carpets rocks on the shore, a wide variety of organisms make up the group we call *protists*.

What Are Protists?

The kingdom Protista is made up of organisms that do not belong in any of the other kingdoms. As a result, the members of this kingdom are quite diverse, as Figure 1 shows. But all protists have one thing in common: they are eukaryotic. Protists are eukaryotic organisms that cannot be classified as fungi, plants, or animals.

Several important characteristics evolved in protists. These characteristics include membrane-bound organelles, complex cilia and flagella, sexual reproduction with gametes, and multicellularity. Organelles, including mitochondria and chloroplasts, allow single cells to perform a wide variety of functions. Complex cilia and flagella like those found in protists are also found in many other types of cells. For example, the cells that keep particles out of our lungs use the same type of cilia as is found in protists. Sexual reproduction allows for greater genetic diversity than reproduction by binary fission does. Multicellularity allows cells to specialize, which in turn allows for the development of tissues, organs, and organ systems.

Reading Check: What important characteristics arose among protists during their evolution? (See the Appendix for answers to Reading Checks.)

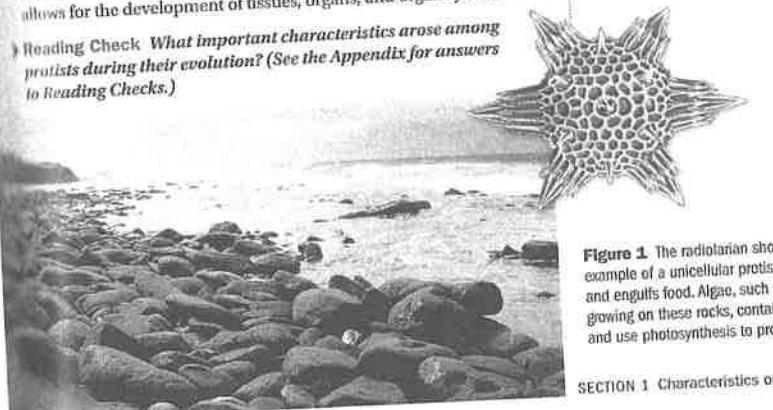


Figure 1 The radiolarian shown above is an example of a unicellular protist that captures and engulfs food. Algae, such as the kind growing on these rocks, contain chloroplasts and use photosynthesis to produce energy.

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Figure 2.5. U.S. History Textbook Page

WITNESS HISTORY AUDIO

Children in the Coal Mines

Progressive reformers were appalled by the child labor that was common in coal mines, textile mills, and other industries. John Spargo, a union organizer and socialist, sadly described the terrible conditions endured by boys working in the coal mines.

"The coal is hard, and accidents to the hands, such as cut, broken, or crushed fingers, are common among the boys. Sometimes there is a worse accident: a terrified shriek is heard, and a boy is mangled and torn in the machinery, or disappears in the chute to be picked out later smothered and dead. Clouds of dust fill the breakers and are inhaled by the boys, laying the foundations for asthma and miners' consumption."

—John Spargo, *The Bitter Cry of the Children*, 1906



▲ These boys toiled in a West Virginia coal mine.

The Drive for Reform

Objectives

- Identify the causes of Progressivism and compare it to Populism.
- Analyze the role that journalists played in the Progressive Movement.
- Evaluate some of the social reforms that Progressives tackled.
- Explain what Progressives hoped to achieve through political reforms.

Terms and People

Progressivism	Jane Addams
muckraker	direct primary
Lincoln Steffens	initiative
Jacob Riis	referendum
Social Gospel	recall
settlement house	

NoteTaking

Reading Skill: Identify Details Fill in a chart like this one with details about Progressivism.

Progressivism		
Problems	Muckrakers	Reforms
<ul style="list-style-type: none"> Industrial hazards Exposed conditions Factory laws 	<ul style="list-style-type: none"> Exposed conditions Factory laws 	<ul style="list-style-type: none"> Factory laws

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Figure 2.6. Algebra Textbook Page

9-1 Quadratic Graphs and Their Properties

Objective To graph quadratic functions of the form $y = ax^2$ and $y = ax^2 + c$

SOLVE IT!

Getting Ready!

As a cat walks along the railing of a balcony, it knocks a flowerpot off the railing. The function $h(t) = -16t^2 + c$ gives the height h of the flowerpot after t seconds when it falls from a height of c feet. How long will it take the flowerpot to reach the ground? Explain your reasoning.

Lesson Vocabulary

- quadratic function
- standard form of a quadratic function
- quadratic parent function
- parabola
- axis of symmetry
- vertex
- minimum
- maximum

Take Note

Key Concept Standard Form of a Quadratic Function

A quadratic function is a function that can be written in the form $y = ax^2 + bx + c$, where $a \neq 0$. This form is called the **standard form of a quadratic function**.

Examples $y = 3x^2$ $y = x^2 + 9$ $y = x^2 - x - 2$

The simplest quadratic function $f(x) = x^2$ or $y = x^2$ is the **quadratic parent function**.

The graph of a quadratic function is a U-shaped curve called a **parabola**. The parabola with equation $y = x^2$ is shown at the right.

You can fold a parabola so that the two sides match exactly. This property is called **symmetry**. The fold or line that divides the parabola into two matching halves is called the **axis of symmetry**.

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two introductory paragraphs that feature a quotation), visual information (a photograph), and study supports (objectives, terms and people, a note-taking task with a graphic organizer, and a section focus question). We are informed why this section matters: "Industrialization, urbanization, and immigration brought many benefits to America, but they also produced challenging social problems." The section offers an exposition of events and features social science vocabulary.

We rummage a bit more and pull out an algebra textbook. The "Quadratic Graphs and Their Properties" section stops us (see Figure 2.6). There is much less flowing text on this page, with paragraphs consisting of one, two, or three precisely worded sentences. Study supports include lesson vocabulary, an objective, and a key concept box. The page also includes a graph and a problem to solve. An illustration accompanies the presentation of the problem to assist the reader in visualizing the scenario. The key concept is explained as follows: "A **quadratic function** is a function that can be written in the form $y = ax^2 + bx + c$, where $a \neq 0$." This section emphasizes explanation and, like our biology and history pages, employs a density of domain-specific terminology.

Our hands touch a slim volume next, a definite contrast to the three bulky textbooks that we have looked at. John Steinbeck's (1937/1963) classic novel *Of Mice and Men* emerges, a weathered paperback volume. Unlike the textbooks, this book is completely prose: no visual information, no study supports, just page after page of unbroken paragraphs. At the start of Chapter 3, you read,

Slim and George came into the darkening bunk house together. Slim reached up over the card table and turned on the tin-shaded electric light. Instantly the table was brilliant with light, and the cone of the shade threw its brightness straight downward, leaving the corners of the bunk house in dusk. Slim sat down on a box, and George took his place opposite.

"It wasn't nothing," said Slim. "I would of had to drowned most of 'em anyways. No need to thank me about that." (p. 42)

There is no technical vocabulary in the passage, although several references are made to life in a past time and place. This text also includes dialogue and dialect. Sentences are straightforward and not very elaborate. The entire work follows a storytelling pattern, as many of

the same characters will be featured during the narration of the action throughout the book.

Of course, you are likely to find a number of other texts in that backpack: photocopied material, packets, a world language textbook, technical booklets, a health textbook, perhaps a trade book, and so forth. Our backpack analysis obviously does not factor in online hypertexts that this student will be reading as part of classwork. So, to return to our question, what does it mean to be a reader of such diverse and varied texts? What does this ninth-grade student face every time he or she transitions from one academic discipline to the next? What does it mean to read through a disciplinary lens?

Disciplinary Discourses

Certainly, you noticed with the four examples presented in this chapter that each text has a particularly unique way of talking to its readers. Vocabulary issues are definitely central to these distinctions, but there is more going on than use of discipline-specific terminology. Each of these texts relies on a different discourse. Each text assumes a discrete reservoir of disciplinary knowledge and asks students to gain insights about some facet of their lives through a unique disciplinary perspective. “These are different worlds: different purposes, different writing styles, different organizations, different language, different modes of communication, different visual layouts, different expectations of relevant background and experiences, and different uses of knowledge” (Buehl, 2009b, p. 230).

Each of these texts draws on established disciplinary traditions of what are useful materials to study, what are the accepted standards for locating and evaluating information, and what are the procedures to be used for examining and interpreting information to develop theories and explanations of what we know. How a reader thinks when trying to understand an author communicating through a historical text contrasts mightily with how a reader thinks when trying to understand an author communicating through a mathematics text.

Discourse Outsiders

Teachers need to realize that their subject disciplines are examples of discourse communities and that their students, who are predominately

outsiders in these academic discourses, may feel overwhelmed or even alienated by all the academic jargon—the outsider’s depiction of a discourse—in a biology text, a math lesson, a history passage, or a literary interpretation. People who are outsiders in a discourse need support and mentoring when encountering texts packed with insider knowledge.

In Chapter 1, I described literacy development as becoming increasingly specialized as adolescents move into the more compartmentalized studies of academic disciplines. We would agree that all four disciplinary texts featured in this chapter assume readers who have developed basic and intermediate literacy skills. Yet, because readers must also undertake qualitatively different approaches for understanding each of these distinctive texts, our students need the additional instruction that we have termed disciplinary literacy.

Let’s take a closer examination of each of the four disciplinary texts presented in this chapter. A ninth grader reading these texts is confronted by four major variables in disciplinary learning.

1. Each text exhibits characteristics that we have identified as inherent in complex texts.
2. Each text represents a discrete academic discourse, which enhances text complexity.
3. Adolescents have to be receptive to expending the necessary effort to meet the challenge of reading and learning from each of these texts, which is an identity issue.
4. Adolescents must be sufficiently skilled to engage in the modes of thinking outlined earlier as essential reading comprehension processes.

Subsequent chapters detail instructional strategies that address these four key variables. The remaining pages of this chapter pinpoint some of the significant challenges awaiting readers in the four disciplinary areas of science, social studies, mathematics, and literature. At times, the discussion may feel overwhelming: We are talking about ambitious goals for our students, and many of them have certainly not yet reached these levels of performance. These are texts that will need to be worked to be comprehended, as explained in Chapter 6.

REFLECTION INTERLUDE

Touch base in your thinking with the Gradual Release of Responsibility model (see Chapter 1, page 27). What kinds of modeling, instructional support, and scaffolding would make it possible for students to gradually develop, grade by grade, the capacity to meaningfully interact with texts in these four disciplines?

Comprehension of Science Texts

The biology page presented earlier in this chapter (Figure 2.4) displays many of the issues that students must confront when reading science texts. This text will strike many readers, especially those who are not science insiders, as quite difficult. (Do those liner notes on Renaissance era music really seem so unfriendly in comparison?)

Vocabulary Load

The density of biological terminology is likely our first impression. The sample text provides a heavy dose of biological discourse that represents language used by biologists to describe and explain living things. New terms like *protists*, *gamete*, *zygote*, *zygospore*, and *alternation of generations* are introduced and defined, as are a host of other terms like *binary fission* and *cytokinesis* on subsequent pages in this chapter of the biology textbook. Yet, the text is rife with carryover terms, biological vocabulary that students have met previously and are expected to make meaningful connections to without elaboration. On the single sample page alone, these insider discourse terms are used: *organism*, *eukaryotic*, *membrane*, *organelle*, *cilia*, *flagella*, *multicellularity*, *unicellular*, *mitochondria*, *chloroplasts*, and *photosynthesis*. The reader is expected to fill in a sense of what each of these terms entails.

Assumed Knowledge

However, the discourse of science goes much deeper than biology words. When the author of this text refers to characteristics in the section title,

readers must infer what scientists regard as essential characteristics in living things, why scientists focus on these characteristics, and how scientists find out. Readers must therefore make the adjustment to reading through a scientific lens. Likewise, the reference to classification represents a deep understanding of processes that scientists undertake to classify, in this case, living things, and implicit is the classification system used by biologists and why they use it. Readers are somewhat cued to this system of biological classification by mentions in the text of *kingdom*, *plant*, and *animal*. Several other deep scientific understandings are also assumed when the author drops in language like *genetic*, *sexual reproduction*, *organ systems*, *evolution*, and *specialize*. For example, how systems are conceptualized in biological science, how they work, how they interact with each other, and what the various systems are are subsumed beneath the appearance of the term *system* in this section. Each of these terms presumes an extensive network of science knowledge and experience. Finally, readers must recognize that general terms like *diversity*, *organ*, *tissue*, and *kingdom* have very significant and discrete meanings when used in science contexts (e.g., *diversity* means something very different when it crops up in social studies contexts).

Underlying the layer of information on this sample biology page, then, are not only how biologists communicate but also how biologists think and how they behave when investigating phenomena and developing biological knowledge. In the themed issue of *Science on language and literacy*, van den Broek (2010) summarizes this task facing readers of science materials: "Science texts differ greatly from narratives in their demands on working memory management, comprehension strategies, and the use of background knowledge" (p. 455).

Without systematic attention to reading and writing within subjects like science and history, students will leave schools with an impoverished sense of what it means to use the tools of literacy for learning or even to reason within various disciplines.

—Pearson, Moje, & Greenleaf, 2010, p. 460

Academic Language

These textual elements are also present in earth science, physical science, chemistry, and physics curricular materials. All tend to employ what researchers describe as academic language, which is more difficult for students when compared with more informal language or narrative

structures such as fiction. Academic language can be recognized by the formal—and to many readers, distant and uninviting—tone, by the complexity of content, and by the impersonal stance. (Academic authors are not really noticeable, they exude little personality in their writing, and they just stick to the facts.) Academic language is well represented in sentences such as “Multicellularity allows cells to specialize, which in turn allows for the development of tissues, organs, and organ systems.” Snow (2010) summarizes these textual qualities: “Among the most commonly noted features of academic language are conciseness, achieved by avoiding redundancy; using a high density of information-bearing words, ensuring precision of expression; and relying on grammatical processes to compress complex ideas into few words” (p. 450).

Visual Information

Another look at the biology page reveals additional elements of science texts, visual information—in this case, a photograph and an illustration. Science texts rarely depend on language alone to explain science concepts, and often as much as half a page is devoted to pictures, diagrams, drawings, models, figures, tables, and other graphic representations. Not only are visual literacy skills mandated (i.e., the ability to decipher a diagram or navigate a chart), but readers must also move back and forth between prose passages and visual information to make sense of an author’s message. Consequently, readers must synthesize what an author is saying with how this might be visually represented, and they may indeed be compelled to reread a passage and reexamine a visual before they arrive at a satisfactory understanding.

Furthermore, because of the tight economics of producing written texts, publishers may adopt an either-or position, with information provided in either written prose or visual displays but not both. Hence, readers may have to infer what a science concept or process might look like, or infer how a visual might be described if discussed in written language. Finally, online texts may include video, simulations, and other multimedia, presenting readers with additional levels of processing and synthesizing information.

Mentoring Science Readers

Science teachers may underrate the challenge of science texts because of their deep familiarity with the concepts that these texts are presenting, although science teachers do tend to be aware that such texts can present a barrier to learning in science. As a result, complex science texts are often deemphasized or even sidestepped in the classroom, and teachers resort to imparting science information through telling and demonstrating. As Pearson et al. (2010) conclude,

reading about science is replaced by listening to someone talk about science.... Avoiding the challenge of engaging students with texts may seem efficient, yet it ultimately undermines student learning. Instead of confronting reading problems head on, it breeds student dependence on the teacher for science knowledge and places the learner in a passive role. (p. 460)

Webb (2010) notes an emerging consensus within the science education community for the need to focus more on the facets of science literacy, which features two strands: fundamental science literacy, which emphasizes the language and thinking of science, and derived science literacy, which engages students in applying their understandings to their world and to societal issues that have science relevancy. Webb concludes,

A number of researchers...believe that for someone to be judged scientifically literate in both the fundamental and derived senses, he or she must be first proficient in the discourses of science, which include reading, writing, and talking science. In order to achieve these goals, students must be helped to cross the borders between the informal language they speak at home and the academic language used at school, particularly the specialized language of science. (p. 448)

Science teachers will find ideas for mentoring students to read through a scientific lens in the following chapters.

Comprehension of Social Studies Texts

We now zero in on the history page entitled “The Drive for Reform” (Figure 2.5). Although the language in this text may seem less intense than on the sample biology page on protists that we just examined, readers are nevertheless immediately transported into a different realm of thinking and expression.

Conceptual Vocabulary

On our sample history page, the discourse of history predominates, with concept-laden terms like industrialization, urbanization, immigration, Progressivism, ethnic groups, middle class, political parties, federal government, state legislatures, social classes, social problems, social justice, and society constantly embedded into the flow of this narrative. Of these elemental social science terms, only Progressivism is presented as a new idea that will be discussed in this section of the history textbook. Readers are expected to make meaningful connections to the other terms on their own. Hugely significant overall concepts, such as reform, power, influence, and justice, are also referenced—each embodying extensive webs of relationships and prior knowledge that encompass not only history but also the disciplines of political science and sociology.

Historical References

In addition, proper nouns such as names of people (e.g., Jane Addams), places (e.g., West Virginia), events (e.g., the Triangle Shirtwaist Factory Fire, which appears on subsequent pages), or titles (e.g., *The Jungle* and *The Shame of the Cities*, which also follow) must be regarded as concepts and treated in many respects like meaningful vocabulary. For example, Jane Addams is emblematic of certain elements of Progressivism. Her contributions help readers develop a more nuanced understanding of this movement in U.S. history, and her name may conceivably be dropped into future discussions as an elaboration, illustration, or comparison. Readers must know more than who she was; they must develop an understanding of what she means. It is interesting that given all the history discourse identified on just this one page, only Progressivism appears in the “Terms and People” sidebar, which ostensibly highlights new learning to be detailed in this section of the chapter. The other targeted terms and people, including Jane Addams, are presented on ensuing pages.

Historian Perspectives

Readers will certainly feel that they are encountering a lot of stuff on these pages. Although the material may appear less esoteric than the description of the protists, the history text still may seem overwhelmingly jam-packed with facts. Many readers could possibly lose the strand of the narrative

as they bounce along from one unfamiliar reference to the next. Again, comprehension necessitates that readers must shift into a particular disciplinary lens, in this case, reading like a historian.

Implicit on this sample page is an understanding of what types of past experiences are valued by historians, why historians are interested in these experiences, how they collect pertinent information about these experiences, what questions they entertain as they examine this information, and how they arrive at meaningful conclusions, explanations, or interpretations about these historical phenomena. Although the authors provide a “Why It Matters” explication, at a deeper level, readers must infer how the study of history helps them understand their lives and times and how the study of this history helps them make sense of some facet of their lives and times. Readers should rightfully ask of the authors of history, “Why are you telling me all this?” Readers should be able to construct possible answers through insights derived as readers through a historian lens.

Visual Information

Like science texts, history texts often provide information in multiple forms: There is both a photograph and a graphic organizer on this history page, and readers can also expect visual displays such as illustrations, maps, charts, political cartoons, graphs, and tables. Some of these visuals are intended to help readers imagine what is described in the prose segments, so they have a better feel for past times and events. The photograph of the children who worked in coal mines performs this function.

Other graphic information is presented to augment the text or provide information not specifically developed in the prose; these visuals must be examined more carefully and then be synthesized with written narration. Line graphs comparing children attending schools versus children employed in factories appear later in this section of the history textbook and are examples of this latter category of visual information.

In addition, primary source materials, such as quotations, personal letters, commentaries, and excerpts from historical documents, are frequently interspersed into the text. A quotation from a historical exposé introduces the Progressive movement on this page.

Mentoring History Readers

A number of these features also predominate in other texts that students read in history and other social studies classes: articles from magazines, newspapers and other periodicals, excerpts from biographies and autobiographies, secondary sources written by historians, primary documents, and a vast array of online content. Yet, as Lee and Spratley (2010) observe, the default experience for most students remains learning history through textbook reading, and students are not mentored to read such texts through a historian lens: “In contrast, schools typically socialize students into seeing history as a simple chronology of events and the explanations of social, political and economic phenomena offered in texts as a truthful and unexamined master narrative” (p. 7).

As a consequence, students tend to view the study of history as fact collecting, as Wineburg (1991) discovered in a study comparing how historians and high school students read historical texts. Students

“When reading history, students need to be able to understand what happened in a sequence of events as well as recognize the interpretation that an author inevitably incorporates.”

—Schleppegrell, Greer, & Taylor, 2008, p. 176

notice the whos, whats, and wheres of history, whereas historians are concerned primarily with the whys and hows: why events happened the way they did, how these events affected people and changed things, why the author of a text arrived at certain interpretations and conclusions, and how the author constructed and supported these explanations and perhaps theories. In particular, historians cue into the author of the texts they read. Historians critically examine the basis of the author’s explanations and track possible author perspectives, beliefs, and even biases. In effect, historians read disciplinary texts as arguments, whereas students read these texts as truth statements.

Like all textbooks, social studies textbooks are written to project an aura of authority, which is of course a natural tone for a useful classroom resource. Hynd, Holschuh, and Hubbard (2004) conclude, “The tradition in history textbook writing is to write a coherent, seemingly true story, even though the story relies on hypothesized cause/effect relationships and other interpretations of data” (p. 142). That social studies textbooks are written by hidden authors can obscure author voice and blur the lines between factual information and interpretative arguments. For example,

two of the first three sentences on our sample history page qualify as arguments and not as fact statements: “Industrialization, urbanization, and immigration brought many benefits to America, but they also produced challenging social problems.” “Progressive ideas brought lasting reforms that still affect society today.”

Traditionally, we would identify such sentences as main idea statements, but in reality, these are arguments and must be read with an understanding of how historians might arrive at such conclusions. In addition, many sentences contain generalizations, which imply that the author examined specific factual information and could therefore confidently encapsulate such findings into statements such as “came from many walks of life,” “growing middle class, whose power and influence was rapidly spreading,” and “a few wealthy Americans driven by a desire to act for the good of society.” In effect, the author is arguing that these statements reflect a justifiable reading of the evidence. Additionally, implicit in this entire chapter is the most transcendent argument: Of all the U.S. history that might be studied, the Progressive era is so particularly significant that it warrants extended time and consideration via an entire chapter.

This discussion focused primarily on history as the area of social studies most frequently taught in middle and high school. Yet the aforementioned issues with comprehension of social studies texts also apply to readers of civics and government, economics, cultural geography, psychology, and other social sciences. Each of these disciplines presumes a specific discourse and understanding of how knowledge is conceptualized, organized, and decided. Each also mandates a discrete disciplinary lens for reading, writing, and thinking. Social studies teachers will encounter a number of ideas for mentoring students as readers of the discipline in upcoming chapters.

Comprehension of Mathematics Texts

We now turn again to the sample algebra page on quadratic graphs (Figure 2.6). Once more, the discourse of mathematics is immediately striking to readers.

Mathematics Terminology

The new algebraic concept being presented is quadratic function, which is precisely defined and explained, with examples provided. Other new terms introduced are *parabola* and *axis of symmetry*. However, readers are assumed to be conversant with and knowledgeable of an embedded flow of mathematics terminology, such as *form*, *function*, *degree*, *rate*, *polynomial*, *nonlinear*, *property*, *equation*, and *value*. The term *graph* has a deep and significant meaning in mathematics contexts, which implies an understanding of what forms graphs might assume, why graphs might be used to illustrate relationships, and how various mathematics procedures can be followed to construct such graphs. Likewise, readers have to shift to an understanding of the mathematical usage of the term *models*: what is meant by a mathematic model, how mathematic models can be displayed, what types of phenomena can be modeled, and what we can learn from examining such models.

Furthermore, mathematics vocabulary can be especially deceptive because many key mathematics terms are also used in more common ways in general conversation, such as *model*, *property*, *form*, *line*, *function*, *divide*, and *value*. Readers have to become particularly adept at discourse code-switching from informal everyday usage to precise mathematical meanings.

Multiple Modes of Presentation

The other most obvious feature of mathematics text is the lack of extended prose. Mathematics texts typically communicate mathematics principles in multiple modes; pages display symbolic notations, graphic representations, drawings, illustrations, and examples of problem solutions, intertwined with a few conceptually deep, carefully worded sentences. On some pages, the only sentences that appear are embedded into problem discussions or word problems. Readers have to be flexible thinkers, able to adjust to these different informational modes constantly, and able to extract meaning from each. Comprehension is predicated on synthesizing insights from all these different informational forms and requires readers to go back and forth, from the sentences, to the symbolic notation, to the graphic representations, and so forth, to construct an understanding.

Compacted Prose

The terseness and density of the sentences require a reading (and sometimes rereading) that is careful and methodical. Consider the processing necessary to make sense of this sentence from the quadratic graphs page:

A quadratic function [OK, this is the new concept I am learning. Quad means 4, so this has something to do with 4.] is a type of nonlinear [What do they mean by *nonlinear*: nonline, not a straight line?] function [What exactly is meant by *function*? Am I clear what a function is? What are other functions I have learned about?] that models [How do mathematicians model things? This connects to the cat and flowerpot example. They can show mathematically how the pot falls.] certain situations [Like the cat and flowerpot example, I wonder what other situations work here?] where the rate of change [What do I understand *rate* to mean? What are some things where the rate might change?] is not constant [What does *constant* mean: stays the same? So, if the rate or speed of something changes, then it doesn't stay the same rate while this change happens?].

In addition, readers have to be comfortable translating symbolic notation into prose language as they read; " $y = ax^2 + bx + c$, where $a \neq 0$ " is translated into "y equals a times x-squared plus b times x plus c, where a does not equal zero." Of course, knowledge of the algebraic use of variables is assumed in this statement, as well as an implicit question of why a cannot be zero. In a real sense, readers of mathematics need to be bilingual as they constantly switch back and forth between reading math sentences and symbolic notation. As Moje and her colleagues (2011) observe, "Mathematics is a language, and algebra in adolescent classrooms, where symbolic notation may be confronted seriously for the first time, is as much about the language as the ideas expressed by it" (p. 469).

Reading Mathematically

Clearly, readers must read mathematics sentences differently and more intensely than they read sentences, and indeed paragraphs, in most other disciplines. For the majority of readers, one trip through a math sentence, and certainly a math page, will not result in satisfactory comprehension. Consider this sentence, for example: "The graph of a quadratic function is a symmetric curve with a highest or lowest point corresponding to a maximum or minimum value." This is a packed sentence with several

meaningful parts and much deep conceptual language. It is unlikely that most readers will fully comprehend this sentence from a single reading at a relatively normal pace.

In their study investigating how historians, chemists, and mathematicians read the texts of their fields, Shanahan and Shanahan (2008) discovered that rereading is regarded as an essential strategy for mathematics:

Students often attempt to read mathematics texts for the gist or general idea, but this kind of text cannot be appropriately understood without close reading. Math reading requires a precision of meaning, and each word must be understood specifically in service to that particular meaning. (p. 49)

Observers have noted that *text* in mathematics classes usually does mean *textbook*. There is ongoing conversation and sometimes spirited debate within math circles as to what constitutes most effective approaches for teaching mathematics and, as a corollary, what should be the nature of math textbooks.

Whatever the approach, all math textbooks introduce students to the discourse of mathematics and expect students to become increasingly comfortable receiving this discourse as readers and learners of the mathematics curriculum. Whether students are actually asked to read a mathematics textbook is another matter, however. Math teachers express concerns that reading the textbook can be a barrier to learning mathematics for struggling readers. Yet, many math teachers are also dubious that most of their students will successfully comprehend math texts, even in advanced mathematics courses.

A number of researchers describe traditional mathematics classroom routines as a review of previous instruction and homework, teacher explanation and demonstration of new material, interactions between teacher and students to check understanding through working of example problems, and seatwork as students tackle homework that provides further practice of new material (Draper, 2002). The textbook may be used solely as a source for model examples and practice activities; students may not actually be engaged in reading it to comprehend new material.

Mathematics teachers often maintain that reading in math is so unlike reading in other disciplines that many general literacy practices are not a particularly good fit for mathematics classrooms. When present,

literacy instruction in mathematics typically is limited to a narrow focus on two areas: teaching mathematics vocabulary for obvious reasons and comprehension procedures for deciphering story problems (Siegel & Fonzi, 1995). At times, additional attention may be allocated to cueing students into textbook features (e.g., how a text is organized, how the textbook works), but as Draper (2002) comments,

Learning to read and use the textbook for learning rather than simply as a repository for problems would be an advance over the lack of literacy instruction that currently exists in the typical mathematics classroom. However, more important than learning how to read the textbook is learning how to read, write, listen, speak, and think math texts. (p. 523)

In other words, learning to read through a mathematical lens.

Mentoring Mathematics Readers

Some mathematics programs explicitly guide teachers into mentoring their students as readers. In contrast to traditional instructional routines, students may work cooperatively to read and discuss textbook sections to work out their comprehension. In effect, students need to be mentored to think mathematically not only when occupied with solving math problems but also when reading about mathematical concepts and relationships. Students, and many adults, would react to mathematics texts such as the quadratic page displayed in this chapter by pleading, "This is too hard. You should just tell us what we need to know." The result is what many researchers term a pedagogy of telling. Teacher demonstration certainly plays a role in mathematics instruction, but when students do not develop the capacity to access mathematics understandings independently, students become mired in a continuing cycle of dependency on a knowledgeable other.

This cycle is depressingly familiar to math teachers:

1. A mathematical concept is explained and modeled.
2. Students seem to get it.
3. A day or so later, a number of students are unclear.
4. The teacher or an able student explains the concept again.
5. Students seem to get it.

6. A week or so later, a number of students are unclear again.
7. The teacher or a knowledgeable student explains once again.

Students who have not been mentored to think mathematically as readers tend to be students who struggle with retaining mathematical understandings over time. Many students, and adults, gradually adopt identities as the kind of people who cannot get math: "Students come to regard mathematics as a mysterious activity far removed from everyday life and reserved for an elite with special talents" (Siegel & Fonzi, 1995, p. 635).

“
Reading a wide array of mathematics-centric and mathematics-related texts in the classroom can generate lifelong interest and support learning to reason mathematically.
”

—Lee & Spratley, 2010, p. 15

Mathematics teachers justifiably tend to feel particularly singled out for the performance of their students because of No Child Left Behind testing and accountability. These pressures may lead math teachers to assert, "We have to do math. We don't have time to do literacy, too." Yet, literacy practices are inextricably linked to thinking mathematically, and the reasoning necessary to problem-solve comprehension of math texts is foundational to interacting with the world through a mathematical lens. Instructional ideas for reading through a mathematic lens are introduced in subsequent chapters.

Instructional ideas for reading through a mathematic lens are introduced in subsequent chapters.

Comprehension of Literary Texts

In comparison to the three disciplinary texts that we have just examined, the *Of Mice and Men* excerpt may seem remarkably less complicated. Readers are not navigating elaborate pages rife with varied informational displays and compacted sentences and paragraphs steeped in insider discourse. However, readers of literary fiction are presented with more novel challenges.

Indirect Communications

Unlike the science, history, and algebra examples, literary fiction such as Steinbeck's classic novel represent an indirect communication. Expository texts, such as the sample Progressives, protists, and quadratic pages, can be seen as direct communications: The author

undertakes to tell readers directly what he or she feels is important for the readers to know. Of course, as pointed out in the previous sections, these texts also have significant implicit layers: unstated assumptions of knowledge, understanding, and perspective. However, the intention of authors of expository texts is to convey directly some sort of meaningful communication.

Literary fiction, however, depends on the reader's interpretation to achieve an understanding. Authors of literary fiction communicate to readers through the telling of a story, the behavior of characters, the use of language, and the craft of literary devices. Authors of literary fiction may grapple with ideas or project a point of view about some facet of life as a key element to their writing, as opposed to authors of popular fiction, whose main goal may be to tell an interesting story and provide entertainment to the reader. Did Steinbeck have something on his mind when he wrote *Of Mice and Men*? Was there something he wanted readers to understand about the Great Depression, the lives of displaced people, obligations to cognitively challenged individuals, friendship, loyalty, and morally ambiguous choices? If so, he does not directly tell us; it is left to the interpretations of his readers, using what he tells us and our own knowledge and experiences as guides for constructing our understandings.

Many individuals relish the experience of reading through a literary lens. However, other readers can become frustrated with this challenge of constructing meaning with competing possibilities, preferring instead expository texts and authors who come right out and tell us what they have to say. It is certainly acceptable for individuals to desire texts that exhibit direct communications.

In our schools, such individuals are frequently those who have math/science identities and may not see the point of reading literary texts. Another sometimes resistant group can be those students who are readers of popular fiction, sometimes voracious readers of a particular genre like fantasy or teen-centric novels, and expect fiction to be entertainment and deal with topics of high interest to them. These students revel in the vicarious experiences of their personal reading and may be stern judges of literary fiction as boring, disconnected from their lives, lacking in the imaginative flavor they seek, and too challenging for expending their time and energy. Many students, exasperated by their struggles with a

work of literature, lobby to just be told what the book means, hoping for a CliffsNotes distillation from their teacher that they can settle on as their comprehension.

A Fictional Lens

However, unlike science and mathematics classrooms, students anticipate that they will be reading and writing for a significant portion of their learning in English language arts classes. Students will read from a variety of literary genres, from short stories, novels, plays, and poetry, to literary nonfiction such as essays, speeches, biographies, and autobiographies, to informational texts such as newspaper and magazine articles, to a myriad of online texts.

Literary fiction, whether delivered in literature anthologies or met in novels, can be especially problematic for students as they develop their capacity to read through a literary lens. First, because literary fiction is an indirect communication, readers need to be constantly aware of the author's voice and the author's moves in writing the work. Readers are called on to infer the author's perspective as they interact with the elements of a story. Furthermore, the craft of an author not only displays aesthetic value as a work of art but also is critical to the communication of a possible theme and ideas.

Second, novels, because of their length, require endurance, perseverance, and the ability to track events and ideas through extended story lines and details. Readers have to stay with it even if a work does not sparkle with the excitement and appeal of book-length popular fiction. Third, readers must engage their imaginations to re-create a world suggested by an author, a world that might focus on people, places, times, events, and cultural practices that are very distant from readers' lives or are unknown to readers. A common complaint by students is "Why do we have to read *this* book about people who are not like us?"

Our *Of Mice and Men* example illustrates these variables of literary fiction: a story set during a past historical period with people placed in a rural Western United States context that includes descriptive writing, dialogue between characters, and storytelling by an author skillfully employing literary devices in his craft. What this book might mean is something that student readers need to explore with their teacher.

Writing Conventions

In addition, literary fiction can contain a huge range of writing conventions and use of language. Students might read noncontemporary prose with more intricate and lengthy sentence structures by authors such as Nathaniel Hawthorne, Charles Dickens, or Edgar Allan Poe. Students might encounter unfamiliar dialects in works by Zora Neale Hurston or Mark Twain. Students might have to resolve unconventional narrative structures, such as stories told out of sequence or by multiple narrators. Students are also likely to be expected to infer meanings of unfamiliar general vocabulary, words infrequently used in conversation but which surface as the more precise language of written texts. A random stop on a page in *Of Mice and Men* reveals the words *lumbered*, *brusquely*, *pantomime*, *contemplated*, *imperiously*, and *terrier*—vocabulary that can be difficult for many students.

Literary Terminology

Unlike our science, social studies, and mathematics examples, however, the discourse of literature does not necessarily appear on the page of the novels and short stories read by students. Instead, the disciplinary discourse of English classes appears in the discussion and analysis of literary works. Terminology such as *figurative language*, *metaphor*, *simile*, *flashback*, *foreshadowing*, *satire*, *irony*, *parody*, *diction*, *allusion*, and *symbolism* are all vehicles for describing and explaining the author's craft as readers wrestle with developing an interpretation of a literary text. In effect, readers must pick up that an author is using irony even though the word *irony* is nowhere on the page. There is also the discourse of composition (e.g., *thesis statement*, *parallel structure*, *present tense*), the discourse of grammar (e.g., *noun*, *conjunction*, *adjective*, *complex sentence*, *modifier*), and so forth.

The discourse of literature provides a disciplinary tool for communicating recognition of an author's moves in writing a work and communicating understandings of that work. For example, readers should be aware that *Of Mice and Men* is an allusion to a line in the "To a Mouse, on Turning Her up in Her Nest With the Plough" poem by Robert Burns ("The best laid schemes of mice and men go often askew") as they consider possible ideas that Steinbeck is exploring through his story. Of course,

many of our students would rather just read the story and not spend all that time delving into it using this disciplinary terminology.

Mentoring Literary Readers

Given that the reading of written texts is central to the English language arts curriculum, it is frequently assumed that it is the English language arts teachers who should shoulder the responsibilities for the development of adolescent readers and writers. Yet, English language arts teachers protest that they are not trained reading teachers either, and clearly the English language arts curriculum does not encompass the type of disciplinary texts that are prevalent in science, social studies, mathematics, and technical fields.

However, readers of literature also need mentoring. As Lee and Spratley (2010) observe,

Just as there is little direct instruction about how to tackle the problems that disciplinary texts pose in history, science and mathematics classrooms, there is also insufficient attention in literature classrooms to the nuts and bolts of how to read a range of literary texts. (p. 9)

In a wonderful disciplinary literacy resource for English language arts teachers, Gallagher (2004) makes a strong distinction between assigning

“
Our students CAN become readers if they are provided with consistent and explicit support to use strategies that they do not yet use on their own, and if these strategies are developed and then used with big purposes and relevant tasks in ready view.
”

reading and teaching reading: “When it comes to reading challenging text, not enough attention has been paid to understanding the steps we can take to provide effective scaffolding for our struggling readers” (p. 7). He describes a series of classroom literacy practices that take readers through surface understandings to second-draft readings that engage readers in focused rereadings and collaboration to construct deeper understandings of complex literary works.

Smith and Wilhelm (2010) sum up mentoring students to read through a literary lens:

It seems so obvious that we should teach students how to do what we want them to do, but sadly, many reviews of what and how we teach in our English language arts classes show that it is rarely done. In our experience, however, rather than focus on teaching students how to read literature, teachers often

substitute teaching two other foci: technical vocabulary and the details of a particular interpretation of a text. (p. 10)

Instructional ideas on reading through a literary lens are emphasized in subsequent chapters.

PARTING THOUGHTS AND TALKING POINTS

- Teachers can, and indeed need to, teach reading comprehension. Comprehension instruction emphasizes explicit modeling and support of fundamental comprehension processes: making connections to background knowledge, generating questions, creating visual and mental images, making inferences, determining importance, synthesizing, monitoring, and problem solving.
- Comprehension instruction must be embedded in the teaching of the discourse of an academic discipline to support learners as they increasingly assume some of the attributes of insiders. Content teachers, as masters of their disciplinary discourse, are the people best positioned to mentor their students as they experiment with using comprehension strategies to learn within specific academic disciplines.
- Reading through a disciplinary lens involves immersion into the discourse of a discipline. Students gain experience with reading, writing, hearing, and speaking the talk of an academic discourse and gradually adjust their thinking to correspond to the way scientists, historians, mathematicians, fictional authors, and other disciplinary experts think when engaged in reading and learning in their respective disciplines.
- Teachers need to examine the role that written texts need to play in the learning within their disciplines. Students who are not expected to read, or who can rely on being told or shown what they need to know, do not develop their capacities as readers of disciplinary complex texts.

Frontloading Instruction That Activates and Builds Academic Knowledge

Essential Question: What instructional practices should precede the reading of complex disciplinary texts?



As teachers, we realize that reading assignments are an important way for students to build background knowledge in our disciplines. Yet the research in Chapter 3 exposed limitations to this approach: If students lack prior academic knowledge, then they are less likely to build that knowledge through reading assignments. Teachers often compensate for these shortcomings in two ways. First, when students are assigned reading, teachers follow up with presentations that ensure that students are apprised of key material. In effect, as teachers, we hedge our bets; because we do not have faith that many of our students will get what they need to get on their own, we make sure that we also tell them what they need to know. The downside of this first approach is that students (i.e., all students not just struggling readers) very quickly figure out that they do not need to work a text to understand it; what they will be held responsible for learning will be handed to them in class presentations. As a result, students do not develop their capacity to independently access knowledge in the discipline.

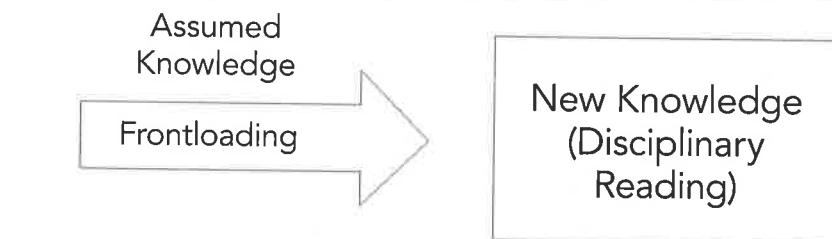
Second, teachers may forgo reading assignments, as discussed in Chapter 2. Students do not even encounter complex texts in a discipline when this approach is followed, and they become totally dependent on someone else orchestrating their learning for them. Students very soon realize that effective listening, not competent reading, will be the pathway to acceptable classroom performance. It is apparent that the Common Core State Standards for reading in history and social studies, science,

and technical subjects are a direct counterpoint to the tendency to avoid the reading of disciplinary texts.

Comprehension research suggests a different tack: Rather than expecting to build academic background *through* reading, we recalibrate our instruction to build academic background *for* reading. Rather than introducing concepts through reading, we introduce concepts before reading. Students then explore and develop these concepts more deeply as they engage as readers with complex texts. Frontloading—the teaching that addresses academic knowledge gaps—activates and builds hidden knowledge assumed by authors before students read. As teachers, we rearrange our instruction to frontload reading assignments so that the classroom flow evolves from “read about it and then we will talk about it” to “we will talk about it, read about it in more depth, and then talk about it some more.”

Figure 4.1 presents a diagrammatic representation of frontloading disciplinary texts. New knowledge, the object of our lessons and the focus of disciplinary reading, is displayed in the box. Frontloading, the instruction preceding reading that addresses assumed academic knowledge, is portrayed as teaching outside the box. Although certainly a commonsensical way of proceeding, in our zest to move into the new material, we devote inadequate attention to frontloading instruction. Unfortunately, ineffective reading comprehension by many of our students is the result of our shortchanging the frontloading of instruction. By neglecting our teaching outside the box, we jeopardize the likelihood that many of our students will be able to obtain new knowledge through reading disciplinary texts. To underscore the importance of frontloading

Figure 4.1. Frontloading Disciplinary Texts



instruction, Alexander and Jetton (2000) refer to “knowledge” as “the scaffold for text-based learning” (p. 291).

REFLECTION INTERLUDE

What does teaching outside the box look like in your discipline? What would students already have to know to be successful readers of your disciplinary texts? Consider a specific unit of study. Try to list three or four packets of assumed knowledge that might be the focus of front-loading instruction to prepare students to read complex texts for that unit.

Three different frontloading scenarios may be considered as teachers address academic knowledge gaps in their disciplines: frontloading when students have had considerable access to assumed academic knowledge, frontloading when access to assumed academic knowledge is unequally distributed among students, and frontloading when many, or perhaps most, students lack academic knowledge. Detailed descriptions of a host of frontloading strategies, including those highlighted in the following sections, are provided in a companion volume to this book, *Classroom Strategies for Interactive Learning* (Buehl, 2009a). (For a complete listing of strategy references, see the Appendix.)

Frontloading With Much Knowledge

This first frontloading scenario in many respects flies under our radar as teachers, and although it is essential to disciplinary learning, frontloading with much knowledge is frequently overlooked. This is academic knowledge that we perhaps take for granted because we believe that students should already know this material. We assume that they will have access to this category of academic knowledge for good reason: We have personally taught it a unit ago, two months ago, or a semester ago, or our colleagues have taught it as part of the previous year’s curriculum. This first frontloading scenario is predicated on review; as teachers, we need to ask to what extent authors assume that readers will need to review previous learning for comprehension.

However, although authors may assume that students are mentally reviewing previous learning, we cannot trust that this is actually transpiring as students read disciplinary texts. Students may quickly glide over references to prior knowledge without meaningfully connecting to past learning. Furthermore, if any class time is dedicated to review, chances are great that the only person in the room who does not need practice in revisiting prior knowledge, the teacher, is conducting the review. In his study of brain research and implications for memory, Sousa (2006) makes a distinction between teacher-centered review (i.e., the teacher or perhaps a couple of student volunteers restate previous learning) and clture (i.e., every student is engaged in activating and verbalizing previous learning).

Many of our students will not automatically activate and process previously encountered academic knowledge unless classroom activities regularly prompt them to do so. As teachers, we are painfully aware that much of what students are expected to learn during units of study does not stand the test of time, and the temptation is great for students to view substantial portions of the curriculum as disposable knowledge, knowledge that only needs to be retained long enough to satisfy short-term assessments. Researchers are increasingly using the term *working memory* to refer to temporary storage that does not make it into permanent memory (e.g., Marzano, 2004). Hence, disciplinary instruction needs to continually factor in the necessity of reinforcing and utilizing learned knowledge.

The key dynamic of any of the following frontloading strategies is that students are conducting their own reviews, are engaged in reexamining their previous learning, and are gaining practice in continually verbalizing their understandings. Strategies within this first frontloading scenario provide ongoing reinforcement of domain knowledge and build a strong expectation that students remain conversant with previous learning. Review frontloading is especially beneficial for students who bring scant out-of-school knowledge to topics under study and who need repeat trips through material to learn it thoroughly.

“

The good reader knows to relate what is being read to prior knowledge, and he or she is aware that good readers predict what might be in upcoming text and relate ideas encountered in text to their prior knowledge.

”

—Pressley, 2002a, p. 304

Quick Writes

A number of frontloading strategies are effective tactics for immersing all students in touching base once more with acquired curricular knowledge. Particularly powerful are Quick Writes, which involves all students in verbalizing their understandings. A quick write is basically just that, a 1–3-minute informal written response, usually sparked by a prompt that the teacher provides to students for organizing their thinking as they reactivate previous learning (see Figure 4.2). Some examples of discipline-specific quick writes are the following:

- History: “One thing a person should know about the Reconstruction Era is...because...”
- Physical science: “A key term about plate tectonics is...because...”
- Geometry: “If I explained *congruent* so a person could really understand it, I would say...”
- English language arts: “Something that is ironic can be recognized by...”
- Art: “One thing particularly important about Impressionist painting is...because...”
- Music: “Something confusing about counting in 6/8 time is...”

Figure 4.2. Quick Write Prompts

- | | |
|--|--|
| <ul style="list-style-type: none">• I learned...• I remember that...• I already know that...• I was wrong to think...• I realized that...• I would explain...• I would describe...• An important point is...• The confusing thing was...• This helped me understand...• What made sense to me was...• I was surprised...• A person should know...• The first thing I think of is...• A key term about this topic is...because... | <ul style="list-style-type: none">• My definition of this is...• I can tell you that...• What really impressed me was...• Something I should share about this is...• Some interesting information about...• I want to learn more about...• Something that people get wrong about...is...• My learning answered my questions about...• Since then, one thing I have thought about...• One thing I understand now is...• I changed my thinking about...• A brief summary of...should include... |
|--|--|

- Health: “Something I should share with others about high-sugar foods is...because...”
- Technology: “If I described the steps to follow, I would say, in order,...”

You can structure Quick Writes in a number of ways and use the strategy two or three times a week. You can integrate quick writes into notebook assignments, class journals, or learning logs; you can collect them as exit slips (i.e., students write for the last couple minutes of class and hand their writings to you as they leave the room) or assign them as entry slips (i.e., students write before class and hand their writings to you as they enter the classroom). I have counted quick writes as mini-assessments that are factored into students’ grades; there is accountability, and these mini-assessments are not optional.

I have found using a timer to be an especially effective technique during Quick Writes time. (Online Stopwatch, available at www.online-stopwatch.com/full-screen-stopwatch/, is a great resource if you can project Internet sites in your classroom.) The teacher informs students of the time expectation for their quick writes. Students are expected to begin writing immediately and write steadily until the time has elapsed. The timer technique anticipates the perennial student query “How much do I need to write?” The answer is always “Write to fill the time.”

A crucial dynamic of Quick Writes is student sharing; as a result, students not only reimmerse themselves into previous learning but also receive additional reminders from each other. Quick writes can be shared with partners or in small groups, can be written on index cards and passed several times around the classroom so that each student reads 8–10 different versions of responses, or written on sticky notes and posted on the board for students to peruse, rearrange, organize, and summarize.

(Quick Writes and many of the other strategies that appear throughout this book are more extensively described in *Classroom Strategies for Interactive Learning* [Buehl, 2009a]. In addition, the Appendix provides original sources for each strategy that appears in this book, should you need or want additional information on a particular strategy.)

Meaningful Associations

Association networking strategies are an additional way for you to stimulate student re-creation of past learning. These strategies are usually

best accomplished by students working with partners or in teams to elicit meaningful connections to a topic and briefly elaborate on the nature of each connection. Knowledge Mapping, for instance, engages students in creating a concept map with the significant associations that they can recall about a topic previously studied. For example, students in world history are asked, "What are at least six meaningful associations you have to feudalism that are key to understanding that concept?" (See Figure 4.3.) When each team reports back to the class, ask them to briefly explain why each association contributes to an understanding of feudalism (e.g., "Land" is connected because the lords were granted tracts of land, and the peasants were required to stay on the land and work it).

Knowledge Maps could be displayed on chart paper, projected with overhead transparencies, or shared verbally as you solicit associations and construct a class Knowledge Map on the board. Within an entire class, it is likely that some of the discourse of the domain knowledge (e.g., *fief, manor, serf, vassal*) would surface on at least a few maps, providing a more comprehensive review for the entire class when these maps are shared and explained.

You can also use a variety of other association networking strategies that involve more extensive review. Alphabet Brainstorming charts, for example, provide students with a grid corresponding to the 26 letters of the alphabet. Student teams work to fill in as many of these boxes as they can, using the alphabet as first-letter prompts for meaningful associations

Figure 4.3. Feudalism Knowledge Map

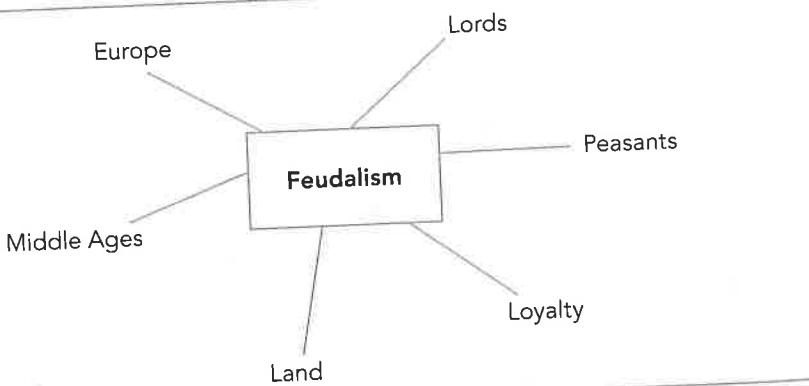


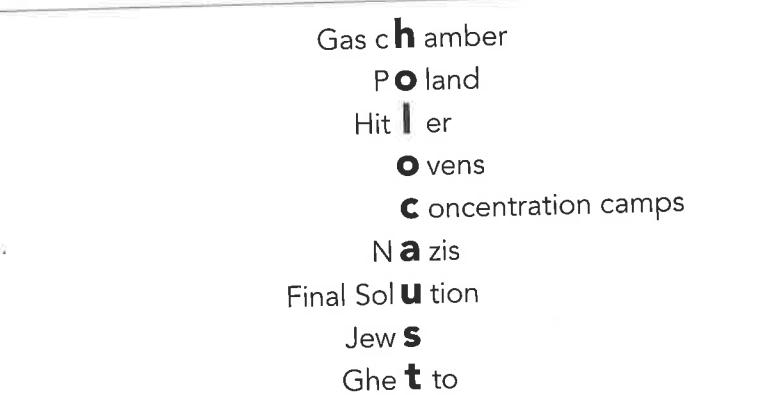
Figure 4.4. Students' Alphabet Brainstorming Chart on Genetic Traits

A adaptations	B baldness	C chromosome cross	D dominant DNA	E eye color	F female	G Genes Gender Genotype
H heredity	I inherited traits inbreeding	J	K	L	M mutation meiosis Mendel	N natural selection
O offspring	P parent's phenotype	Q	R recessive	S Sex-linked Traits	T Twins	U
V variation	W weight	X X-chromosome	Y Y-chromosome	Z zygote		

to a topic that has been studied. Figure 4.4 displays a biological science review on genetic traits; student teams were given between 7 and 10 minutes to probe their memories and jot down meaningful associations from prior learning on this concept. (A reproducible version of this chart is available in *Classroom Strategies for Interactive Learning* [Buehl, 2009a].) Most important, during sharing time, the student teams explain why each association is a meaningful connection to the concept, thus practicing verbalizing previous learning and providing a reminder to individuals who had perhaps forgotten some elements about the topic or needed additional explanation of the original learning.

Knowledge Ladders are a third variation of an association networking strategy. You array the prompt in this activity in a vertical column, and students use the letters as cues for meaningful connections to that topic. A letter can appear in any place in a word, unlike the first-letter trigger for the alphabet grid. A Knowledge Ladder created to review learning on the Holocaust that precedes the reading of literary works such as *Number the Stars* by Lois Lowry, *The Diary of Anne Frank*, or *Night* by Elie Wiesel in an English language arts class is presented in Figure 4.5.

Figure 4.5. Holocaust Knowledge Ladder



Assumed Knowledge Tracking

A third category of review strategies engages students in tracking assumed knowledge as they undertake a cursory first read of a disciplinary text. During this initial perusal, you prompt students to notice carryover items: author references to information and terminology that was previously introduced and discussed. As outlined in Chapter 3, these intertextual allusions assume that readers will be freshening up prior disciplinary learning and able to apply and expand their understandings of these concepts and connections. Basically, you ask students to track this information: "What have we already covered that this author expects us to know?" If students can mark the text, then you can have them highlight all terms and references that represent earlier learning, either during this course or previous courses. Highlighting is an especially vivid and colorful way of demonstrating how much of the understanding of a specific text is predicated on prior learning. Other options include students listing review items on sticky notes attached to the text, on a notebook page, or on an index card.

Of course, listing review items from a text is an awareness activity; students need to dig deeper and explain their understandings of these review items if comprehension is to be enhanced. Partner Shares are an excellent mechanism for verbalizations of prior learning. For example, one partner can be assigned one paragraph or section, and the other partner the next paragraph or section. After each has identified the

review items from their assigned portion, they swap lists and study them before explaining each item to their partner. Or, teams can analyze a section, write the list on an overhead transparency or dry-erase board, and explain to the rest of the class. Another variation is for one team to explain a second team's review list and vice versa. Ultimately, however accomplished, students need to not only identify but also clarify their understandings of prior learning.

Review/New Charts are another example of an assumed knowledge tracking strategy, in this case tailored for mathematics reading. As discussed in Chapter 3, the comprehension of mathematics texts is highly dependent on deep conceptual knowledge that is triggered by mathematics terminology. Students first individually examine a chapter section of a math text to isolate review concepts as well as identify the new material that is being introduced. Initially, you might give students photocopied versions of the text and different colored highlighters (e.g., yellow for review concepts, pink for new concepts). The result will be pages highly colored in yellow, reinforcing how much mathematics reading is based on prior learning. Next, students meet with partners or in collaborative groups to chart review items side by side with the new learning. Figure 4.6 presents a Review/New Chart detailing concepts presented in an algebra chapter. After completing the chart, partners or group members then orchestrate their own review session by taking turns explaining each item in the review side of the chart, which are then shared with the entire class.

Frontloading With Diverse Knowledge

This second frontloading scenario represents a challenging daily classroom reality for disciplinary learning. Refer again to Marzano's (2004) descriptions of the disparities in academic knowledge among his nine prototypical students, as discussed in Chapter 3. Some of your students will bring high out-of-school access to topic and domain knowledge related to disciplinary units of study, some will bring spotty knowledge (i.e., they will know some things but lack other assumed knowledge), and some will arrive with significant academic knowledge gaps. Frontloading academic knowledge rather than merely activating prior classroom learning.

Figure 4.6. Review/New Chart of the Algebraic Concept Slope

Review	New
rate	rate of change
horizontal distance	slope
vertical distance	dependent variable
ratios	independent variable
quantity	run
variable	rise
unit rate	positive slope
constant	negative slope
ordered pair	
linear	
coordinates	
denominator	
numerator	

Note. Adapted from a strategy by Rita Crotty, Hempstead High School, Dubuque, IA.

Any classroom activity that engages students in exploring and sharing prior knowledge that can be subsequently expanded through the reading of disciplinary texts has high value when academic knowledge is diversely distributed among students. In addition to the strategies shared in this section, problematic situations (i.e., ask students to hypothesize solutions to a possible problem before reading a text that develops potential resolutions) and visual cueing (i.e., use illustrations or photographs to stimulate sharing of prior knowledge) are strategies that you can employ to address academic knowledge gaps when students bring unequal experiences and access to disciplinary learning.

Brainstorming

Brainstorming strategies are particularly conducive to this second frontloading goal. The intention behind these strategies is pooling

academic knowledge. In this case, you, the teacher, are not the only potential access point to assumed academic knowledge; our classes offer multiple access points. Students who lack access to people who can introduce academic knowledge in their out-of-school lives have access to such people in our classrooms: you and their peers. Structure brainstorming activities to engage students in conversations related to topics of study, with the result being an extensive converging of what students know to create a class schema before students read more about curricular topics. Students access each other as knowledge sources and develop the habit of using each other to extend and clarify academic knowledge.

Several popular brainstorming strategies can be integrated into disciplinary instruction. LINK (List, Inquire, Note, Know), PReP (Prereading Plan), and a number of variations of the classic brainstorming strategy K-W-L (Know, Want to Know, Learned) Plus all have potential roles in disciplinary learning (for more detailed descriptions of these literacy practices, see Buehl, 2009a). To illustrate brainstorming as a frontloading activity, I outline a variation that I use with disciplinary texts, the Confirming to Extending grid. This frontloading strategy proceeds in five phases, each phase denoted in a sector of the student note-taking grid (see Figure 4.7).

Confirming: What We Know or Have Heard. The process starts with individual brainstorming, as students quickly jot down a list of things they think they know, or might have heard, in response to a topic prompt you provide. In this example, the strategy was used to prepare students for the study of pathogenic microbes. Initially, students were given three minutes to list as many meaningful connections as they could to the West Nile virus, a disease-causing virus that has appeared recently in various regions of the United States. All of the students responded individually to this first prompt, although out-of-school knowledge clearly varied. Some students had followed news reports or heard people talking about the virus, whereas other students could only think of generic comments related to previous learning about viruses in general (e.g., "It infects your body," "You could get sick," "Washing your hands prevents it from spreading"). The occasional student whose family kept horses, which are highly at risk to the virus, usually brought extensive topic and domain

Figure 4.7. Confirming to Extending Grid for the West Nile Virus

Confirming: What We Know or Have Heard	Revising: What the Author Stated
<ul style="list-style-type: none"> ✓ Is carried by mosquitoes ✓ Is a disease that kills people ✓ Crows can be infected. ✓ They examine dead birds to see if they have it. Carried to the United States from Africa Is very contagious ✓ You should use lots of mosquito spray. ✓ You can get a high fever. <i>Washing hands controls the spread of the virus.</i> ✓ You get sick like you have the flu. ✓ It is now in our state. <i>It grows in stagnant water.</i> ✓ It kills horses. ✓ Is not a major threat to us 	<p>There are very few deaths from this disease in the United States.</p> <p>Get it from mosquito bites not from other people</p> <p>Cities are not doing more spraying to control it.</p> <p>Virus is only carried through the blood.</p> <p>Virus does not live in stagnant water; mosquitoes breed there.</p> <p>Officials are more worried about E. coli infections and bird flu virus.</p>
<p>Does the virus affect animals other than birds?</p> <p>What part of the United States or world has the most cases?</p> <p>Is there an effective treatment or medicine?</p> <p>Is there a vaccine for it?</p> <p>How can you tell which mosquitoes have it?</p> <p>If you get it once, can you get it again?</p> <p>Can you get it from touching a diseased bird?</p>	<p>1% of people get encephalitis (swelling of brain) and can die; hits elderly and people with weak immune systems; is a low risk to people; is rarely fatal.</p> <p>Infects birds, horses, people; 100 types of birds can get it.</p> <p>?</p> <p>No treatment</p> <p>No vaccine for people but is being researched to find one</p> <p>?</p> <p>Only spread by mosquitoes that feed on infected birds; you can't get it from infected animals.</p>

(continued)

Figure 4.7. Confirming to Extending Grid for the West Nile Virus (Continued)

What are the symptoms?	Is like flu: high fever, headache, convulsions; symptoms can be like Parkinson's disease; 80% of infected people have no symptoms.
Extending: What Else Is Important to Know <p>Most people don't even know they have been infected and do not get sick.</p> <p>May only feel tired and have headache or body aches</p> <p>Could get skin rash</p> <p>Can be spread through blood transfusions and organ transplants</p> <p>Evidence that can be spread by infected mother to child at birth or through breast-feeding; not clear on this</p> <p>Doesn't affect chickens or turkeys; poultry has natural antibodies.</p> <p>First found in New York in 1999 and now found in 32 states</p> <p>There is horse vaccine; horses should have vaccination; a third of unvaccinated horses die from West Nile.</p> <p>Should wear long-sleeved clothes, use insect repellent, and avoid outdoors at dawn and dusk</p>	

knowledge to this personal inventory of information related to this microbe.

Students continue the brainstorming phase collaboratively as they share their lists with partners, talk about their connections, and augment their lists together. Finally, brainstorming culminates in a class sharing, as you create a baseline of class knowledge on the board or overhead by soliciting items from each set of partners. The emphasis of this first phase is to stimulate student conversation and sharing related to the topic and to provide students who bring low access to this academic knowledge with a heads-up on the material from their peers. Once a comprehensive class list is developed, students copy the items into the "Confirming" square of the note-taking grid.

Inquiring: What We Are Wondering. The second phase engages students in taking an inquiry mind-set into their reading. Each pair of partners considers the conversation at this point, and as they think about

what has been revealed so far about the topic, they together generate two or three questions that a person might have about this virus. The pairs may even question some of the information that has been recorded in the first column, as students may know or have heard contradictory things. Partners share these questions with the class, and they are recorded as inquiry items in the second square, “Inquiring.”

Revising: What the Author Stated. With their knowledge thus activated and primed, students read further on the topic. In this lesson, three short articles on the West Nile virus, each at different Lexile difficulty levels, were made available, and each set of partners selected one to read. As they read, students used text coding to compare what the author said with the class prior knowledge that they recorded in the “Confirming” square. They add a check mark in the text next to where the author confirms class prior knowledge, and an X next to where the author contradicts or disconfirms the class prior knowledge. In effect, students are being mentored to use texts to double-check the accuracy of their prior knowledge. Ensuing class discussion clarifies which prior knowledge was confirmed and which should be struck as being unsupported or inaccurate. A line is drawn through items inconsistent with the texts so that students have a visual reminder of which parts of the class prior knowledge is misinformation. Corrected knowledge from the texts is listed in the “Revising” square. Students have a visual, side-by-side representation of how their reading led to revisions in their understandings of this topic.

Resolving: What the Author Stated. Partners then return to the text for a second read to seek answers to the class questions recorded in the “Inquiring” square. Those addressed by their author are answered in the “Resolving” square. Questions not addressed by their author are identified by a question mark. Partners share their answers to the inquiry questions with the entire class. Because three articles were read, authors did not provide identical information. Some questions were addressed by all authors, some were talked about only in one or two articles, and some remained unresolved, as none of the authors dealt with them. This phase emphasizes reading to use texts to resolve questions that had piqued the interests of the class.

Extending: What Else Is Important to Know. The final phase involves a return once again to each text for a third examination to identify any information that seems important but did not surface in the confirming, revising, or resolving phases. These items represent new knowledge and are recorded in the “Extending” section at the bottom of the grid. When the process has been completed, students have filled in a note-taking grid that clearly indicates confirmed knowledge, revised knowledge, knowledge that resolved class inquiries, and new knowledge.

I have walked extensively through this frontloading strategy because brainstorming, while potentially powerful for addressing academic knowledge gaps, can also be problematic. Quite frankly, as every teacher is well aware, not everything that students feel they know or have heard will be accurate or consistent with disciplinary learning. In particular, our text-to-world connections by their very nature often contain prior knowledge that may be only partially accurate, hearsay, or erroneous. (See comments on science misconceptions in Chapter 3.) Students may also overgeneralize from or misinterpret personal experiences to bring flawed text-to-self connections. Whereas some of our students may know very little about a topic, others may “know” things that are untrue. Teachers fear, with good reason, that students may be just as apt to remember inaccurate information that emerges from class activities as they do the desirable content of our lessons. Yet, if prior knowledge is not examined and directly aligned with new learning, then students are also at risk for not making the necessary connections that would lead to refining or at times replacing their prior knowledge with the disciplinary learning of our curriculum. Brainstorming frontloading strategies should engage students in a side-by-side analysis of their prior knowledge as it compares with their reading and learning from disciplinary texts. Such strategies also encourage students to view knowledge as mutable, as incomplete and open to revision as they interact with it again and again over the course of their lives.

The teacher language used to introduce brainstorming activities therefore must be carefully considered. You will notice that for the initial stage of the West Nile virus lesson, I solicited things that students *might* know or have heard rather than things they categorically *do* know. The qualifying nature of this language is intentional; we all hold flawed

understandings in some areas of our prior knowledge, and we all have heard things that we have not necessarily ascertained as to accuracy or from a credible source. Furthermore, students will be reluctant to openly share what they think they know about a topic if the classroom dynamic is structured to expose them as ignorant or ill informed. My response is generally, "If you have heard it, likely someone else has, too. Let's list it up here and test it with our further learning." To model, I emphasize with students that like anyone, I hold knowledge that is imprecise, erroroneous, or in need of revision. One mark of intelligence is to recognize flawed understanding and rebuild knowledge that can claim a firmer basis in credibility and scholarship.

One other comment is necessary regarding brainstorming strategies. Teachers need to know their students and accurately predict whether they would be able to generate meaningful connections to a targeted prompt. "West Nile virus" was a workable prompt for my students in Wisconsin because of ongoing news reports and cautions about this disease. (Lyme disease, carried by deer ticks, would have been another probable winner for students in our apparently microbe-infested state.) However, if hardly anyone can say much of anything about the West Nile virus, then obviously as teachers, we would have miscalculated the extent of students' out-of-school knowledge about the topic and would need a more extensive frontloading activity, such as a video clip about the virus, as discussed in the third frontloading scenario.

Thought-Provoking Statements

A second group of frontloading strategies that engage students in pooling prior academic knowledge revolves around Lightning Rod Statements that serve as a springboard for discussion and sharing. An example of a Lightning Rod Statement in a foods class is "People in the United States can generally trust that the food they purchase is safe for their consumption." Students will bring text-to-self, text-to-text, and text-to-world knowledge to their thoughts on this statement. Any student who has contracted a food-borne pathogen will have some compelling personal experiences to share, but all will likely have read or heard something about this issue. After sharing perspectives, students are ready to read a disciplinary text, whether about food preparation techniques, laxly enforced regulations, the use of pesticides, the behavior of bacteria,

historical developments in food safety, industry safeguards, food distribution in our world economy, or risk factors as to the prevalence of unsafe food. After reading, students revisit the statement and decide how they would respond now that they know more about the topic.

Anticipation and Prediction Guides. Popular variations of this type of frontloading are Anticipation Guides and Prediction Guides. Initially, you ask students to evaluate, agree or disagree, or predict based on their current knowledge about a topic by responding to a series of statements. The general intention of these guides is a before-and-after dynamic: "This is what I am thinking based on current knowledge" compared with "This is what I am now thinking based on my new understandings" after reading more about the topic.

Figure 4.8 presents a science Prediction Guide that engages students in conversation and sharing what they know about invasive species. Students first individually, then with partners or in small groups, talk about this topic by using their prior knowledge to predict which of these statements is supported by scientific evidence and which are not. After these conversations, groups share their comments with the whole class, again to pool the knowledge that students bring to this topic before reading. After this whole-class sharing, students then read further to compare what an author tells them to their prior knowledge and predictions. As students read, they annotate the text, either marking or using small

Figure 4.8. Prediction Guide on Invasive Species

What does the evidence say? Make some predictions about what scientists currently know about invasive species.

True	Prediction	False
	1. Invasive species are only plants.	
	2. Invasive species are destructive to an ecosystem.	
	3. Invasive species are introduced unintentionally into an ecosystem.	
	4. We really cannot stop invasive species from spreading.	
	5. Invasive species are usually introduced by humans.	
	6. Invasive species are always successful in host ecosystems.	
	7. Invasive species can kill humans.	

Note. Adapted with permission courtesy of Neil Rumney, Rhinelander High School, Rhinelander, WI.

sticky notes, to locate places in the text where the author has something to say about each statement. Students place a 1 in the margin where the author has said something relevant to statement 1, and so forth. Finally, to consolidate their understandings, ask students to marshal their findings from the text for each statement and summarize an accurate conclusion or generalization for each facet of knowledge related to invasive species.

Anticipation and Prediction Guides are a motivational and effective means to stimulate conversation and sharing that addresses assumed academic knowledge in a text. Figure 4.9 represents a Prediction Guide for U.S. history that engages students in thinking like a historian as they embark on learning more about the Reconstruction Era in the aftermath of the Civil War. Like the science guide, which was predicated on the scientific evidence for each statement, this activity asks students to wade into these topics the way a historian might. Students will learn, throughout this process, that historical evidence on these statements might be mixed and that establishing unequivocal answers to the statements is unlikely and, quite frankly, not what historians do. As students read after this frontloading activity, they begin to inventory evidence that supports or does not support each statement. Finally, as a synthesis activity, they develop their supported arguments on each statement, a much more nuanced process than may typically be followed in history classrooms.

Figure 4.9. Prediction Guide on the Reconstruction Era

What do historians think about the Reconstruction Era? Predict how likely historians would say each is true.

HL = Is highly likely to be true. SU = Is somewhat unlikely to be true.
SL = Is somewhat likely to be true. HU = Is highly unlikely to be true.

1. With the abolition of slavery, the lives of African Americans in the South improved.
2. Abraham Lincoln believed that "all men are created equal."
3. Most Americans held racist attitudes during this period in history.
4. The U.S. government did enough to support African Americans in the South after the Civil War.
5. The emergence of groups like the Ku Klux Klan in the South was inevitable.
6. The policies of the Radical Republicans were too radical and did more harm than good.

Figure 4.10. Prediction Guide on Bargaining

Rate each statement as either "L" for likely or "U" for unlikely.

- 1. Bargaining in Mexico is an enjoyable process for both the vendor and the customer alike.
- 2. Vendors deliberately price their goods above what they actually expect to get for the product.
- 3. Vendors think positively about the tourists who negotiate with them.
- 4. You will have better luck in the bargaining process if you act really interested in an item.
- 5. Merchants will frequently give discounts if you buy multiples.
- 6. Bargaining is not limited to handicrafts; you can also negotiate fruit, tacos, and other items in the produce markets.

Note. Adapted with permission courtesy of Barbara Davis, Oregon High School, Oregon, WI.

Figure 4.10 presents a Prediction Guide that deals with teaching cultural knowledge in a world languages curriculum. In this case, students in a Spanish class consider what they know about purchasing practices from merchants and vendors in Mexico. Students weigh in on a number of issues related to bargaining, an experience less frequent in the United States, where one generally expects to pay the price that is listed for a product. Then, students read a short article that talks about the daily theater of making purchases, the expectations of buyer and seller, the good-natured back-and-forth conversations, and the personable and enjoyable interactions. When students get to a statement in the article that defends or defies their guess, they write the number of the question in the margin of the article.

My wife Wendy created a Prediction Guide that accompanied a short article about possible microscopic infestations in the hairs of strings musicians' bows (see Figure 4.11). Although her middle school orchestra students had never heard of bow bugs, they brought extensive knowledge of microscopic creatures that provided a foundation for their understanding as they shared information about head lice, fleas, bedbugs, and other nefarious critters.

Finally, Figure 4.12 presents an Anticipation Guide that relates background knowledge on earthquakes to a newspaper article on an earthquake that occurred in the Midwest region of the United States. Students shared their perceptions and impressions about where

Figure 4.11. Prediction Guide on Stringed Instruments' Bow Bugs

Before reading, check the statements that you predict the author will confirm in the article. Then, after reading, check whether the author confirmed each statement.

Your Prediction	Confirmed by Author	Statement
		1. Bow bugs eat the bow hair on the bow.
		2. Bow bugs need light to survive.
		3. You will know if you have bow bugs because you can see them in the bow hair.
		4. The only way to get rid of bow bugs is to get a new bow and case.
		5. Bow bugs are a serious problem for strings players.
		6. You can actually get a disease from bow bugs.

Note. Courtesy of Wendy Buehl, Oregon Middle School, Oregon, WI.

Figure 4.12. Anticipation Guide on Earthquakes

Read each statement below and decide whether it could happen here.

I Agree	I Disagree	Statement
		1. Earthquakes have recently occurred in the midwestern United States.
		2. The Earth's crust in the Midwest is older and less fractured than in California.
		3. Quakes that occur in the Midwest are strong enough to damage buildings.
		4. Tremors from a quake in the Midwest are more deadly than those in California.
		5. The tremors of a quake in the Midwest reverberate differently than those on the West Coast.

Note. Adapted with permission courtesy of Janice Olson, Black Hawk Middle School, Gratiot, WI.

earthquakes generally happen and how severe earthquakes might be in certain areas. Of course, recent earthquakes in Haiti and Japan provided students with a wealth of text-to-text and text-to-world connections that were discussed before reading about midcontinent North American earthquakes. The newspaper article and Anticipation Guide prepared

students to read a literary text by Jack London, who was an eyewitness to the 1906 San Francisco earthquake.

Point-Counterpoint Brainstorming. Another version of Lightning Rod Statements is presenting Point-Counterpoint scenarios to students as a brainstorming format. In this variation, you ask students to generate possible pros and cons, advantages and disadvantages, positives and negatives, of an idea, an action, or an event.

A useful format for Point-Counterpoint brainstorming is the Thumbs Up-Thumbs Down Chart. The topic for the language arts example in Figure 4.13 was teens and texting. The first phase proceeds with students individually generating positives and negatives of teens texting for the "Thumbs Up" and "Thumbs Down" boxes. These statements are then shared with partners before you solicit the statements for a whole-class inventory of pluses and minuses. Students are immersed in on-topic conversation that pools background knowledge and primes thinking for additional reading. As readers, they then compare their ideas with those articulated by an author, which are charted in the corresponding squares. It becomes readily apparent when the chart is completed where the author's arguments are tilted.

Point-Counterpoint scenarios are a good fit for many disciplines. Other examples of possible Point-Counterpoint brainstorming topics might include the following:

- *English language arts:* Ambition, self-interest, going out on your own
- *Family and consumer education:* Dieting, vegetarianism, divorce
- *Social studies:* Government regulation, foreign aid, free trade
- *Physical education:* Jogging, using steroids, weight training
- *Business education:* Credit cards, covenant not to compete laws
- *Mathematics:* Using a calculator, following a specific method to solve a problem
- *Science:* Protecting endangered species, using fertilizers, cloning, altering foods genetically
- *World languages:* Traveling to foreign countries, eating authentic foods

Figure 4.13. Thumbs Up-Thumbs Down Chart on Teens and Texting

Thumbs Up! Thumbs Down!	
Topic: <u>Teens & Texting</u>	
Ideas/Arguments/Evidence For <ul style="list-style-type: none"> It is an easy way to be in touch. Can support relationships Is fun to text Can be answered when you want to You can figure out what you want to say before you send your answer. You can do it without interrupting what is going on. Can get a message to someone who can't take a phone call Is a good way to get a message out to a group of people Can do it practically anywhere 	Ideas/Arguments/Evidence Against <ul style="list-style-type: none"> Could get to be expensive if you have a limited plan Could do it at inappropriate times, like when driving a car Could replace actually talking to people Might say something you wouldn't say if you were talking to a person Might do it too much Your parents could interfere and take your phone away Inappropriate stuff could get shared. A person might show messages to other people. Might do "sexting" Could use it to cheat in class Get used to spelling shortcuts
Author's Ideas/Arguments/Evidence <ul style="list-style-type: none"> Offers companionship Helps teens feel connected to others Can help teens stay in touch with parents Can ask for feedback or suggestions from others Teens like to be a part of things and know what's going on. Have a 21st-century way of communicating Are doing written communications 	Author's Ideas/Arguments/Evidence <ul style="list-style-type: none"> Can become obsessive behavior Are doing it way too frequently: average of 80 messages a day Pressure to respond immediately, even if in bed at night; has become a distraction Anxiety of being out of the loop Interferes with developing independence Overreliance on getting in touch with parents, or parents getting in touch with teens Do it during classes in school and don't pay attention Repetitive action leads to thumb pain and injury Interruption; need times of peace and quiet Linked to falling grades

Vocabulary-Infused Predictions

Rather than provide students with a single-word topical prompt to cue thinking and brainstorming, you can use Vocabulary-Infused Predictions that present an array of key terms related to a topic. Ask students to share their connections as they piece together possible key ideas or themes. Students then read to clarify any terms and confirm or revise their predictions.

Possible Sentences. With Possible Sentences, you provide students with 12–15 key terms and phrases from a text that they will be reading. With partners, students examine the list and decide which words might logically fit with each other. Then, they put these words in play in a series of predictive sentences. In a sense, they are developing sentences that could appear in a text that features such an array of key terms and phrases. To do this activity, students need to review previously learned vocabulary and size up what they already know about the context of these words.

Figure 4.14 is a world history Possible Sentences activity about the ancient Mesopotamians. Students make predictions about unfamiliar names and places (e.g., Hammurabi, Sumer) by connecting these to items that are commonly known (e.g., wheel, checkers, city-state). Of course, students will recognize *Iraq* from the list, and some will be able to identify *Euphrates* from news stories on the war in that country. Is *Hammurabi* a person, a place, or a thing? Students will be especially alert for clarifying items such as this while they read.

Figure 4.14. Possible Sentences on Ancient Mesopotamians

Each of the terms below is used by the author to tell us something about the ancient Mesopotamians. Write five predictions about these important people. Each sentence should include at least two of the following terms:

Assyria	class	Iraq	stele
Babylon	cuneiform	king	Sumer
chariot	Euphrates	Nebuchadnezzar	Tigris
checkers	Gilgamesh	rivers	wheel
city-state	Hammurabi	soap	ziggurat

Note. Courtesy of Victoria Woodward, Spring Harbor Middle School, Madison, WI.

After sharing their predictions and engaging in conversation about what they currently know, students read the text to ascertain more accurate understandings of the identity and relationships of these items. Students then repair their sentences by rewriting predictive sentences that were not confirmed by the author into summary statements that are consistent with the text, again using the items from the list. Thus, a student predictive sentence (e.g., “Hammurabi was the inventor of the chariot,” which is a reasonable prediction but inconsistent with the text) is rewritten after reading to reflect an accurate understanding (e.g., “Hammurabi was a king of Babylonia who issued laws that were displayed on a stone monument called a stele”).

Figure 4.15 presents a mathematics example of Possible Sentences as students prepare to study data that are connected to their everyday lives. Partners might predict that they will learn that “Average is one of the measures of center.” After reading, the partners revise their sentence to “Mean, median, and mode are all different measures of center” or “Average and mean are math terms that have the same definition.”

Story Impressions. Story Impressions is another variation of Vocabulary-Infused Predictions. You offer students more clues about the interrelationships of items on a list by displaying them in the order they appear in the text to be read, so students can infer which items may be directly linked. Again, this activity is designed to promote conversation and knowledge sharing about a topic that will be studied in more depth. Figure 4.16 is an example of a Story Impressions activity for a health lesson on hearing damage. Relying on what they currently know, students work with partners using the terms to brainstorm a probable message in order

Figure 4.15. Possible Sentences on Data About Us

Write five mathematics predictions using the math words below. Each sentence should use at least two of the math words.

average	horizontal	median	stem-and-leaf plot
axis	line plot	mode	typical
bar graph	mean	outlier	vertical
data	measures of center	range	

Note. Courtesy of Sue Jackan, Toki Middle School, Madison, WI.

Figure 4.16. Story Impressions on Hearing Damage

What's your prediction? Write your version of what a newspaper article might tell us about this headline topic. Use each of the terms in the order they appear:

Headline: Hearing Damage

Terms:

decibel	preventable disability
movies	rising
MP3 player	sensory hair cell
noisy world	toys
pain threshold	volume
permanent damage	

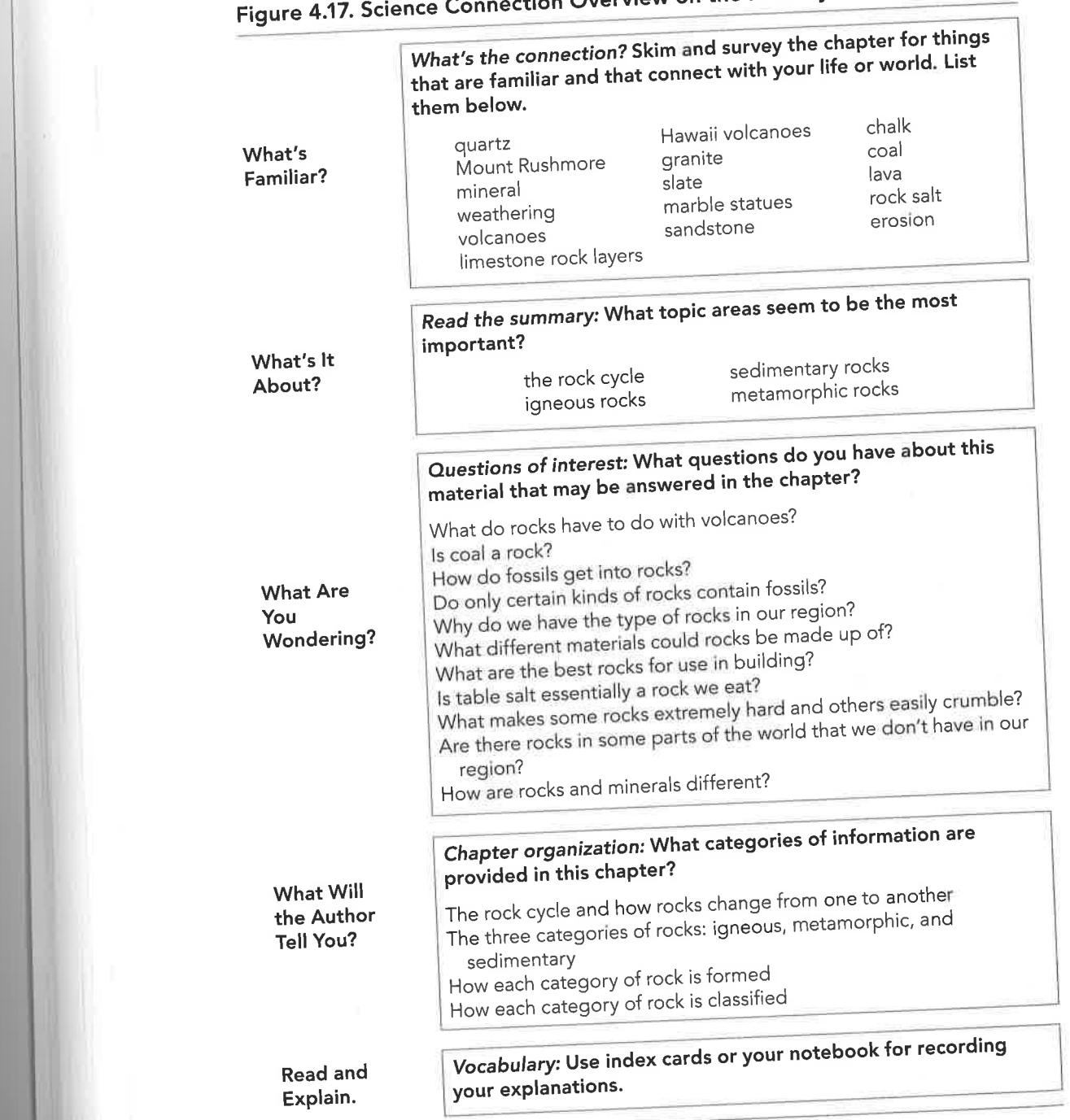
to write a predictive paragraph. After reading, students work individually to use the same Story Impressions list to write a summary of the text.

Student-Directed Previewing

A cursory yet strategic first look at a text also provides students with opportunities to touch base with prior knowledge. Elements of a text, such as highlighted language, illustrations, photographs, and other visual displays, can serve as triggers to topic knowledge. Student-Directed Previewing, in which students undertake an initial overview of a text to identify elements that are familiar and that they already know something about, contrasts with previewing, which is more text-directed. Essentially, a Student-Directed Preview ignores anything in the text that is unfamiliar. Students bypass domain knowledge like the insider vocabulary of a discipline and instead scan the pages to search out anything that connects to text-to-self, text-to-text, or text-to-world personal knowledge. Essentially, students are sizing up the match with a disciplinary text, and they coordinate their own review of relevant prior knowledge.

The Science Connection Overview is an example of a Student-Directed Previewing activity. Because students can become quickly subsumed in insider vocabulary and content that appears esoteric, this student-directed activity concentrates attention on students locating text-to-self and text-to-world connections and stimulates general conversation about the topic before students become more deeply immersed in the domain knowledge of a chapter (for a completed example, see Figure 4.17). Because

Figure 4.17. Science Connection Overview on the Rock Cycle



science textbooks are so heavily visual, this previewing strategy is a good fit for matchup issues in science. (A reproducible version of the Science Connection Overview is available in *Classroom Strategies for Interactive Learning* [Buehl, 2009a].)

The first phase is done individually, as students scan a section or chapter to quickly tag any familiar items. These are listed in the “What’s Familiar?” box of the Science Connection Overview chart. The next phase involves scouting the chapter organization to get the big picture of the chapter for the “What’s It About?” box; if available, a chapter summary is an excellent resource for this phase. Students then meet with partners to share connections and raise questions, which are recorded in the “What Are You Wondering?” box. These questions essentially serve as conversation starters, as students delve deeper into their topic knowledge, share experiences, and pool their knowledge. This activity is designed to prime the pump, so to speak, to center the initial stages of study on the familiar and the known before students embark as readers into the more rigorous examination of the domain knowledge presented in the text.

Frontloading With Insufficient Knowledge

The third frontloading scenario concerns those times when it appears that many, or even most, of your students will be mismatched with disciplinary texts. Because academic knowledge gaps seem endemic in these instances, this third scenario is the time when student reading of disciplinary complex texts is most likely to be sidelined. However, a rich menu of instructional options can be highly effective in building academic knowledge when pooling strategies are inadequate because not enough prior knowledge is available to be shared by students with each other. Your use of nonprint media, such as video, can be especially effective for building academic knowledge during this third frontloading scenario. Teacher read-alouds, hands-on and other interactive activities, guided imagery, visual previewing, and other teacher-led presentations can all be instrumental, not in displacing disciplinary learning from texts, which frequently happens, but in building sufficient academic knowledge for more in-depth learning through reading of complex texts.

Likewise, classroom text-to-self experiences, such as experiments, simulations, hands-on tasks, guest speakers, or even field trips, are often

designed to follow reading, when they could instead be employed as frontloading to address academic knowledge gaps before students read complex texts.

Video and Other Media

In class routines, we often use video after reading, although it can have a more powerful knowledge-building impact before reading. Personally, I have at times been motivated to read a literary work after seeing it dramatized, whether it was the gripping novelization of events of the U.S. Civil War in *The Killer Angels* (read after viewing the movie *Gettysburg*), a revisiting of a play after seeing it performed live (a recent experience with *Waiting for Godot*), or even reading the text of a speech online after watching it on television (President Obama's inaugural address). Although I already know what happens, I still have useful purposes for engaging in reading the actual text.

For example, one of my former colleagues, a ninth-grade English teacher, experimented with frontloading strategies to counteract student frustrations with reading Shakespeare's *Romeo and Juliet*. Many of her students struggled with successfully reading the play as an independent expectation because of the complexity of the language, lack of background on the time period, unfamiliar cultural allusions, difficult vocabulary, and challenging dramatic literature text structure. The teacher did not wish to resort to a common but problematic practice, round-robin reading of the play out loud in class, in lieu of individual student interactions with the text. To preempt some comprehension roadblocks, she shifted to a viewing of the movie version of the play as a frontloading activity. Her students responded enthusiastically to the story as presented in the film adaptation (of course, Leonardo DiCaprio was probably a motivating asset as well), and they were much more eager to tackle reading the play once they realized what a compelling story was awaiting them. The archaic language and difficult text features were less problematic when students could connect the movie story line to what was happening in various scenes. She reported much more successful and engaged reading of the play after frontloading the story, and students now read for different purposes than for discovering what happened. The students were able to track character development, note Shakespeare's craft in writing the play, undertake scene studies, and otherwise examine significant elements of the play.

In some respects, this teacher treated the movie as a first read of the play; subsequently, students returned to the story by reading the actual text for more in-depth understandings. In classrooms, a movie version is typically used as a follow-up to reading a play or novel, although the instructional impact of this practice may be minimal. Quite frankly, at times, watching the movie may be equated as a class reward for surviving the reading of the play rather than as serving a central educational function in curricular learning. In this case, planning the movie as a frontloading activity made the subsequent reading of a complex text, Shakespeare's *Romeo and Juliet*, doable for many students who would have otherwise struggled.

The point being articulated here is not that we should always show a movie version of a literary work first, but there are times when doing so might be a valuable scaffold for texts for which many students might otherwise be mismatched. Of course, it is hardly necessary to show a movie-length video to frontload learning. Strategic use of video clips, segments of movies or programs, or YouTube snippets can be extremely advantageous in addressing academic knowledge gaps.

Short Texts and Alternative Texts

Finally, two other instructional options may factor into frontloading decision making when many students are mismatched with class texts. First, it is not always necessary to read all of a work to provide valuable interactions with complex texts. Although reading literary works (e.g., novels, short stories) in their entirety may be generally desirable, it may not be necessary, for example, to assign all of a physics textbook chapter on thermodynamics when that task may prove overwhelming to many students. If instead you have students work only a section of the chapter, or even seriously grapple with a few key pages, with appropriate frontloading and support, then they would still be developing a capacity to read the discourse of physics without always having to also be told the information.

Another instructional possibility is to assign teams of students to jigsaw different sections of a text, with each team responsible for working out their understandings and sharing with their classmates, who will reciprocate with their sections.

As a second instructional option, at some points, you may need to consider alternative texts that could be a better match for students. Given the wealth of potential texts available on valuable websites, as well as the current rich offerings of useful supplementary print materials, it may make sense to set aside a class textbook and provide students with texts that are more accessible. Again, you can jigsaw the reading, in this case providing the class with multiple texts, each containing some facets of learning on a disciplinary topic, and each at different Lexile levels of difficulty. Some student teams work a more accessible text and report their understandings, while other teams work more complex texts in order to share their contributions to class learning.

Putting It All Together: Frontloading Through Wide Reading

Regular daily reading is necessary if our students are to continue to mature as readers. Yet, Wide Reading is particularly instrumental in building the academic background knowledge that is a prerequisite for learning within the various content disciplines. In Chapter 3, research from the 2007 National Endowment for the Arts study was presented, which called for schools to do more to create a culture of personal reading to stem the slippage of reading habits of adolescents. Wide Reading in a disciplinary context establishes an inquiring mind-set toward learning that can provide bridges into the specific learning targeted by curricular standards.

“

Reading often and reading well are prerequisites for achievement in areas far beyond literature and literacy alone.

”

—National Endowment for the Arts, 2007, p. 91

Marzano (2004) advocated Wide Reading as a major strategy for building academic background knowledge for students who arrive at school lacking experiences with topics emphasized in the curriculum. In effect, Wide Reading—bringing a general disposition to include interactions with written texts as a way of learning about the world—is a significant access point to academic knowledge, especially for individuals who have had low access to academic knowledge through people and experiences in their out-of-school lives.

I consider myself an excellent example of how Wide Reading can trump lack of access to other sources of academic knowledge. I would

rate myself as having entered my schooling as an individual with moderate access to people and experiences that paralleled my learning in disciplinary contexts (I would be Student 2 in Marzano’s chart on page 86 of Chapter 3). I grew up on a dairy farm in Wisconsin (and no, I have never worn a cheesehead hat to a Green Bay Packers football game). As dairy farmers, our family was very much tied to the daily rhythms and routines of managing the farm, which most particularly meant milking the herd of 60 Holsteins twice a day, once at daybreak and once at nightfall. This was nonnegotiable work; it was done every day, whether or not it was a holiday or one of us was ill. Hence, we traveled very little, squeezing in short day trips on a Sunday, after chores and before evening milking. I relished those short visits to area historical sites, state parks, and other points of interest, but I experienced very few of the rich access points enjoyed by my sons as they traveled with me and my wife about the country, as our family took advantage of numerous cultural opportunities.

Most of the people I interacted with as a child were also farm folk or artisans and workers in the neighboring village. My parents were literate individuals who read the daily newspaper, talked about current events, and had subscriptions to *Prairie Farmer*, *The Farm Journal*, *Better Homes and Gardens*, and lucky for me, *The Saturday Evening Post* and *National Geographic*. I was fortunate to have intergenerational friendships with a couple of older adults who stretched my horizons (e.g., a retired farmer who had a passion for history and an especial expertise on the U.S. Civil War, and the assistant postmaster who was a curious and well-read fellow who initiated fascinating conversations and loaned me books). I was also a voracious reader, a youngster who according to my parents, always “had his nose in a book.” My habit of Wide Reading permitted me access to academic knowledge that would not have been available for me in other ways. I related in Chapter 1 how my identity as a historian influenced what I read, but my identity as a reader influenced *that* I read. Stimulated by my reading, I traveled to many places in my imagination that I was unable to visit in person. It was not until I was well into adulthood that I finally set foot on some of the storied Civil War battlefields that I had so long imagined during my days as a farm kid and a reader. As a result, I entered my classrooms much more knowledgeable about topics of the curriculum than I would have been if I had not developed personal access points to academic knowledge through my personal reading.

REFLECTION INTERLUDE

What is a topic area from your out-of-school life that was enhanced by your personal reading? Can you think of a specific area of knowledge that you were able to accrue through personal reading of books, magazines, newspapers, online, or other texts? For example, readers of car magazines might cite knowledge in the automotive area, and readers of fantasy novels knowledge of medieval life and times.

Wide Reading is an especially critical strategy for students of poverty who arrive at school with low access to out-of-school academic knowledge. Some middle schools, and much more rarely high schools, initiate Sustained Silent Reading programs as vehicles to organize a school commitment to inculcate and encourage Wide Reading. Sustained Silent Reading time can be integrated into a school structure in a variety of ways, both within classes or subject areas, as well as across the curriculum. The intentions of these programs are to not only develop reading habits but also spread the benefits of expanding knowledge through Wide Reading. However, dedicating a portion of the scarce minutes of a school day or class period to Wide Reading is often a hard sell to teachers of adolescents, who do not necessarily perceive direct payoffs for disciplinary learning, feel it is more of a hassle than it is worth, or believe that supporting Wide Reading is really not their job as teachers of a specific academic discipline.

However, Wide Reading needs to be understood as an empowering strategy that allows individuals to expand their knowledge base dramatically beyond only text-to-self experiences. Teachers can seek ways to splice Wide Reading opportunities into their curriculum. For example, my son Jeremy, a high school social studies teacher, used Wide Reading as a central instructional strategy during a unit on the World War II years in his ninth-grade U.S. history course. He was teaching classes with a significant number of students who brought low or moderate access to out-of-school academic knowledge; he cotaught one section with a special education teacher and another section with an English as a Second Language teacher, because of the high percentage of English learners

and students with disabilities. Working with the school literacy coach, he identified an ad hoc classroom library of texts that were connected in some way to the World War II years: books, magazines, articles, illustrated texts, graphic novels, and so forth, with a range of Lexile difficulty levels. Students spent the first 10 minutes of each 50-minute class period engaged in Wide Reading; they chose the texts they would read and regularly tracked their topics in their class notebooks. Students responded to their reading with daily quick writes, choosing from prompts such as "Something important I learned today is...." The intention behind this daily assignment was to build general foundational knowledge related to this important historical period, engage students in informing themselves more about the general topic, and develop possible text-to-text connections to unit themes. The Wide Reading assignment was a contrast to targeted reading assignments in class texts that specifically focused on the essential questions for learning for this unit.

“

The use of more than one text about a particular topic may actually facilitate gains in comprehension of that topic. The easier texts in the set could build the background knowledge that makes the more difficult texts easier to understand.

”

—C.H. Shanahan, 2008, p. 139

Considerations When Implementing Wide Reading

Marzano outlined several factors to be considered when integrating Wide Reading into curricular goals. A wealth of reading materials should be readily available to students in classroom libraries, the library media center, and other school sources. Wide Reading tends to be most successful when you connect materials to students rather than rely on students to locate materials on their own time. Because appeal is a key element of this strategy, you need to identify an array of materials that are of high personal interest and are at appropriate levels of difficulty.

Wide Reading within a disciplinary setting should be configured to pique personal interests within a topic area and not demonstrate a specific proficiency or knowledge to be gained by the reading. One of my former colleagues at Madison East High School required students in an advanced physics course to read a popular physics book of their choice as an out-of-class assignment. The point of this reading was not deep understanding of Stephen Hawking, for example; it was to begin to acquaint students with some of the wider literature in the field and encourage them to dip their

toes into this literature. The goal was also, of course, to provide students with multiple contexts to hone their evolving abilities to read, write, and think through a physics lens.

In an important sense, you can use Wide Reading to frontload instruction and the subsequent use of complex texts that focus on unit goals, knowledge, and proficiencies. Follow-up activities are particularly important for mining the effectiveness of classroom Wide Reading experiences. You may ask students to interact with the material they are reading (e.g., “What is one thing you read today that you found especially interesting?”) or interact with their peers about their reading. Design follow-up activities to deepen comprehension and spark conversation, as well as to insure accountability for using the designated class time to sample texts within a topic area.

Encouragement is a key variable, especially to plant the habit of continuing Wide Reading in out-of-school contexts. Conversing with individual students about their reading as a regular classroom dynamic not only reinforces building personal text-to-text connections but also demonstrates enthusiasm for this display of personal reading habits. You can encourage students in a multitude of ways to process what they are learning through their reading. You may ask students to interact with their texts by commenting in their journals or notebooks. You can provide prompts which ask students to talk about what they find particularly important or interesting to allow them to think through their learning in relatively nonthreatening ways. Nonlinguistic responses are equally beneficial; you can ask students to use visual displays, pictorial representations, or even dramatic responses to encourage the use of their imaginations to organize and synthesize their learning. Student-student sharing of interests and new knowledge through partner and small-group dialogue about the topics being investigated is especially valuable. Again, prompts such as “What is one thing you discovered today that you think others should know about your topic?” or “How has your thinking about your topic changed in some way?” can provide the basis for rich conversations about Wide Reading topics. This dynamic asks students to reformulate their learning into personal understandings as they explain to others, thus moving their new learning into permanent memory.

REFLECTION INTERLUDE

How could Wide Reading be integrated into facets of learning in the discipline that you teach? What are possible texts that could be employed to build general disciplinary knowledge and acquaint students with topics within a particular subject? Consider a specific unit of study that might be an appropriate context for folding Wide Reading into students’ classroom routines. What might be some of the texts that you could make available (e.g., books, magazines, news articles, online sources, other texts)?

Mentoring Students to Inform Themselves

If you run across something that you do not know, and it matters, then what do you do? The standard answer today is “I’d Google it.” Certainly, the ease of connecting to informed sources with a quick touch on our keyboard is one of the great advantages of life in the 21st century. Even given the potential dizzying array of informational options that may be compiled from your search, and the concomitant need for decision making and critical analysis, you have a high likelihood of informing yourself fairly readily. Knowledge of information is decidedly taking a backseat in many of our conversations involving disciplinary learning because the assumption has increasingly become that if we need to know something, then we can access it nearly immediately from the Internet. Yet, will we? When do we choose to inform ourselves, and when do we let unfamiliar references go by unresolved, thereby conceding an incomplete comprehension? Also, when do we decide to quit, to not continue reading, because we judge ourselves too uninformed to make sense of an author?

In Chapter 3, I talked about instances when we are well matched with an author, instances when we are somewhat matched, and instances when we are mismatched. We are mostly likely to inform ourselves in the first instance, when most of the text is familiar; a quick clarification of the infrequent unknown item would take little time, and we would be confident that informing ourselves would pay off in our comprehension. Yet, how about the second instance, when we are encountering a number of unknown references? How often will we really stop and check out

what each of these might mean? We might do a lookup now and then, but really, how many such interruptions to our flow of reading will we tolerate? In all likelihood, this second situation is one when our incomplete prior knowledge will remain incomplete, and we will have to tolerate gaps in our understanding. Also, when we are mismatched with an author, informing ourselves would be too overwhelming; we might perceive the magnitude of the need as clarifying multiple items in each sentence. Sure, we can always Google these things, but when do we really take this step, and when do we let our lack of knowledge go by?

This places us at the crux of disciplinary learning, that transition from teaching to learning, the mentoring of students as they grow from teacher-directed responding to more self-directed independent learning. A key to this growth is inculcating in students an inquiry mentality to reading and learning. Chapter 5 focuses on developing an inquiring mind-set to disciplinary learning, but at a foundational level, an inquiry approach starts with “What do I not know that I need to know to understand, and what can I do about it?”

REFLECTION INTERLUDE

How well do you match up with the author of the following biological science passage, which appeared in an article in *National Geographic*? What do you as a reader need to know for this segment to make sense?

Built to feed exclusively on corals like this spindly gorgonian, a translucent 1.7-inch-long (4.3-centimeter-long) *Phyllodesmium iriomotense* houses its branching digestive gland within tentacle-like cerata—outgrowths the animal can shed if under attack. This species is one of the few colorless nudibranchs. (Holland, 2008, p. 95)

Jot down the assumed knowledge that you brought to this text in the left column of the chart in Figure 4.18. Likewise, list the assumed knowledge that you lacked in the right column. What steps might you take to address the assumed knowledge that you were missing as a reader?

Figure 4.18. Comparing Assumed Knowledge to Actual Knowledge

Assumed Knowledge That I Know	Assumed Knowledge That I Lack

First, you very likely took stock of what the author actually tells you, in this case that what is being described is an animal known as a nudibranch and that this animal is quite small, under two inches long. The author also tells you that this creature is sometimes attacked and that most nudibranches are apparently quite colorful. Finally, the author introduces some technical scientific labels: In addition to *nudibranchs*, you are provided with a specific name (*Phyllodesmium iriomotense*), a type of coral (*gorgonian*), and a body part (*cerata*).

Yet what does the author not tell you? What does the author rely on you, the reader, to contribute toward a comprehension of this passage? An initial look confirms that this author expects a familiarity with some sophisticated general vocabulary. Your ability to conceptualize this animal is contingent on language such as *exclusively*, *spindly*, *translucent*, *houses*, *branching*, and *outgrowths*. The author also expects you to draw on some biological terminology: *corals* (which signals that this animal lives in the ocean but in shallower areas like coral reefs), *digestive gland*, *tentacle*, and *species*. Also, the author leaves it to you to infer why this nudibranch would be attacked; your knowledge of the dynamics of ocean life leads you to assume that another animal may try to eat this creature.

In Chapter 3, what an author assumes a reader will already know is referred to as hidden knowledge, knowledge cued by an author but not directly stated. How much of the hidden knowledge can a reader not know before comprehension breaks down? For many readers, the nudibranch example, rife with its complex terminology, would appear too forbidding, a mismatch. As readers, we do an automatic cost–benefit analysis and may determine that we do not know enough to satisfactorily comprehend

this article. We may instead indulge in a quick and cursory look at the photographs on the adjoining pages and then skip on to friendlier territory.

Much of our focus in comprehension instruction has centered on student application of cognitive processes like self-questioning, creating visual and sensory images, predicting, inferring, determining importance, summarizing, and synthesizing. However, the baseline for comprehension remains the match (see the discussion in Chapter 3) between an author's assumptions of the reader's previous knowledge and the actual knowledge that a reader brings to the page.

Chapters 3 and 4 emphasize that as teachers, we must be proactive in our instruction to address such knowledge gaps in our lessons. Yet, our students must also develop a proactive habit of mind when their comprehension falters. Moore (2008) recommends explicit attention to informing yourself as a central comprehension strategy. When as a reader, you have engaged in all the appropriate strategies and your comprehension is still incomplete, you then need to inform yourself by reaching out beyond the text to seek the missing links in your knowledge.

Start by acknowledging with students that at times, effective reading strategies may not be sufficient for adequate comprehension. Occasionally students tell us, "I didn't try because nothing I could do would work anyway." Although it is frustrating to teachers when students throw in the towel without putting effort into attempting a challenging text, this is arguably reasonable behavior from a student perspective. Giving up is a justifiable response when students encounter mismatches with an author's demands: "Why keep digging at a reading when what I ultimately need is not on the page?"

Observe that even proficient readers sometimes make decisions that a text is too hard because they lack sufficient assumed knowledge. However, proficient readers also have developed a repertoire of routines that can diminish their knowledge gaps. For proficient readers, giving up translates into being denied access: access to necessary or useful information, access to others' ideas or perspectives, and access to learning opportunities that can open future doors.

Comprehension Checkdown

The Comprehension Checkdown (Buehl, 2008a) provides students with a protocol for isolating knowledge gaps within a text and systematically working through what students are able to understand and where they are stymied by lack of knowledge. The checkdown provides a series of questions that students should progressively ask themselves as they address mismatches with an author.

Figure 4.19 lists the checkpoints that make up the Comprehension Checkdown. The initial checkpoint is of critical importance. Because readers are strongly tempted to forgo tackling texts that present a mismatch, students need to begin with an asset rather than deficit mindset. Instead of a preoccupation with what they are not getting, this step encourages students to verbalize what they *do* understand.

The second checkpoint is a fundamental comprehension strategy: inventorying personal knowledge that may have relevance to what the author is saying. Chapter 3 highlights text-to-self, text-to-text, and text-to-world knowledge. Students are cued to search their knowledge banks for anything that could be useful for supporting their comprehension.

The third checkpoint prompts students to examine the author's message for hidden knowledge. Some of the hidden knowledge will appear obvious because a reader is able to connect prior knowledge to things the author says. However, when the author assumes reader knowledge that an individual does not possess, comprehension grinds to a halt. Again, students are asked to verbalize exactly what is implicit in a passage that they do not know.

The fourth checkpoint cues readers to evaluate the risk of continuing with knowledge gaps. Some passages will generally make sense, even if

Figure 4.19. Comprehension Checkdown

1. What does the author tell me that I *do* understand?
2. What connections can I make to my personal knowledge?
3. What does the author expect me to already know?
4. How does not knowing affect my understanding?
5. What don't I know that I should know?
6. What hunches do I have about what something might mean?
7. What are some things that I might be able to figure out?
8. Where can I turn to get the information that I need to understand this author?

readers miss some of the author's references. Yet, in other spots, it will be evident that comprehension will be greatly compromised if the knowledge gaps are not addressed. Readers need to take notice of these spots, even if they decide that it is best to move on and look for clarification in the rest of the passage. Some spots will warrant a return sweep, a second read, for further deliberations.

The fifth checkpoint asks students whether they recognize the unknown information. Is the missing knowledge something that they have seen before? Two possible courses of action might present themselves. First, students may recognize that the author has previously covered this information, perhaps in an earlier section or chapter. A quick look back to review can rectify this knowledge gap. Second, a reader may have forgotten prior learning; the unknown material was previously learned but is no longer remembered. In this case, a reader will need to determine an accessible source for a quick revisit of this material.

The sixth and seventh checkpoints encourage inferential thinking. Inferences are possible when readers combine their prior knowledge with textual information to develop hypotheses about what an author might be saying. Clearly, understandings of these portions of a text may be imperfect, but inferential thinking represents readers doing the best they can with the knowledge they possess to figure out possible meanings. Some of the inferences may prove consistent with what an author subsequently tells, and some may unfold as inaccurate or improbable as readers encounter more of the text, and will need to be readjusted.

The final checkpoint takes readers outside the text, when they realize that they have exhausted all their text-based problem-solving strategies. This is the Inform Yourself phase, when readers decide where to turn to enhance their knowledge base. A second checkdown can guide them in their searching (see Figure 4.20). The Inform Yourself phase of comprehension monitoring alerts students to those times when they need to set a text aside and deepen their knowledge base in order to achieve a more acceptable understanding.

It is important that students recognize that all readers meet texts that are too hard given their current prior knowledge and that even proficient readers sometimes need to collaborate and take advantage of other routes to understanding. Mismatches are especially true with many of the texts that students encounter in disciplinary learning, which must be worked to

Figure 4.20. Inform Yourself Checkdown

1. *Use the text:* Are there additional features in the text that can help fill in missing knowledge, such as visual information, illustrations, glossaries, summary statements, and so forth?
2. *Locate a knowledgeable other:* Who might be available to provide a quick explanation or clarification, such as a peer, a teacher, a librarian, or a parent?
3. *Do an Internet search:* For many students, this may actually be their first step, as it now is with many adults. Many useful online resources, including Wikipedia, can assist readers in quickly building a baseline of related background knowledge.
4. *Use reference materials:* How might other available reference sources (e.g., dictionary, encyclopedia, almanac) fill in missing knowledge?
5. *Consult an easier text:* Again, the Internet presents many options for alternative texts, and students should develop the habit of seeking other versions of a topic that may better match their background knowledge.

be satisfactorily understood. Teachers cannot model this dynamic enough with the complex texts of their discipline. The danger is always that students may expend much effort in working a text and yet feel stranded in frustration because they did what they were supposed to do and still did not achieve adequate comprehension.

PARTING THOUGHTS AND TALKING POINTS

- A major recurring issue for teachers in the various academic disciplines is determining what students need to know to read the complex texts of their subjects and how instruction can compensate for gaps in assumed academic knowledge.
- Frontloading is instruction that fronts the reading of complex texts. Research continually indicates that insufficient attention is paid in disciplinary learning to frontloading, with the result being that students are frequently launched into the cold reading of complex texts and comprehend less than they may be capable of understanding.
- Frontloading is integral to teaching the topic and domain knowledge of a discipline. Teachers may be concerned with the classroom time needed to adequately frontload instruction, but if disciplinary learning

Building Inquiring Minds Around Disciplinary Texts

Essential Question: How can teachers mentor students as disciplinary readers, writers, and thinkers?



Albert Pujols. Joshua Bell. Does either of these names strike a meaningful chord for you? The first is arguably the preeminent baseball player of his generation, and the second is arguably the preeminent violinist of his generation. There is an excellent chance that you will get that argument from a serious baseball fan or a dedicated listener of classical music. What are the insider perspectives on Pujols and Bell? What do insiders look for when watching a baseball player during a game? What do insiders listen for when hearing a violinist during a performance? What questions would insiders ask when evaluating the greatness of a baseball player: batting average, home runs, yearly consistency? What questions would insiders ask when evaluating the virtuoso status of a violinist: smoothness of technique, quality of sound, difficulty of performed pieces? It would be much, much more than that.

My wife Wendy knows who Albert Pujols is, the magnificent first baseman of the St. Louis Cardinals, because of my frequent enthusiastic commentary, glancing up from the sports page. I know who Joshua Bell is, the brilliant young violinist, because of my wife's glowing admiration every time she slips one of his CDs into our compact disk player. Yet, in each circumstance, one of us is an insider, and one of us is an outsider. When we attend a baseball game together, what we see transpiring on the field are quite different things, even though we are watching the same series of plays. When we attend a symphony concert together, what we hear the musicians achieving are quite different things, even though we are listening to the same music. As a practicing classically trained violinist, Wendy actually has the insider edge on me, a former no-hit,

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weak-armed high school left fielder and insider wannabe. One of my great thrills was to sit alone for several minutes next to Hank Aaron's historic locker in the Baseball Hall of Fame in Cooperstown. One of Wendy's was to play violin just a couple of steps from Itzhak Perlman as he performed as a soloist for the Madison Symphony Orchestra.

Over the years, I have mentored my wife in baseball, and her insights into the game have grown. Over the years, Wendy has mentored me in classical music, and my appreciation of this music has been enhanced. In effect, we have both assisted each other in seeing some part of the world through a different disciplinary lens. Chapter 2 examines what it means to read, write, and think through a disciplinary lens—like a biologist, a historian, a mathematician, an artist, a novelist, a nutritionist, or a computer scientist. Such disciplinary lenses are predicated on knowledge and experiences; disciplinary insiders have extensive knowledge about the relevant topics of a discipline and have had numerous experiences interacting with the ideas, practices, phenomena, and tools of the discipline.

Wendy not only has studied classical music in considerable depth but also has spent over 30 years as a violinist performing symphonies, concertos, operas, sonatas, quartets, solos, and other musical forms from every period of classical music. Like her fellow music insiders, she brings deep text-to-self, text-to-text, and text-to-world knowledge to her disciplinary lens as a musician. She is able to talk the talk of her discipline, referred to in Chapter 2 as discourse. She can read, write, and think using the discourse of classical music (remember how challenging it was for us to comprehend the Renaissance music liner notes in Chapter 2 when we lacked familiarity with the music terminology used by the author). Yet, in addition, when thinking through a disciplinary lens like music, she knows what to look for, what information to seek, how to organize her thinking, and how she might act on, or react to, what she has read, seen, or heard. Most important, perhaps, she knows the right questions to ask when she is interacting with the world through a classical music lens.

Questioning Through a Disciplinary Lens

What does questioning through a disciplinary lens actually look like? An excellent glimpse into this mode of disciplinary thinking is the 2005 national nonfiction best seller *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything* (Levitt & Dubner, 2005), coauthored by

University of Chicago economist Steven Levitt. The book's gimmick was to examine slices of modern life that are typically of no interest to traditional economists by asking the sort of questions about these phenomena that an economist would. The book is both playful and serious. Chapter titles such as "What Do Schoolteachers and Sumo Wrestlers Have in Common?" are quite whimsical, but the intent of the book is to mentor readers in recognizing that elements of our lives can be more deeply understood through thinking using an economist lens. As the authors state,

Economics is above all a science of measurement. It comprises an extraordinarily powerful and flexible set of tools that can reliably assess a thicket of information to determine the effect of any one factor, or even the whole effect. That's what "the economy" is, after all: a thicket of information about jobs and real estate and banking and investment. But the tools of economics can be just as easily applied to subjects that are more—well, more interesting. (p. 13)

The authors proceed to untangle how incentives are the cornerstone of understanding modern life. If you are intrigued about the schoolteacher-sumo wrestler convergence, then you will have to pick up the book and try your hand at reading through an economist lens.

A number of other recent books also come to mind as outreaches of disciplinary questioning. Thomas Friedman's (2005) best seller *The World Is Flat: A Brief History of the Twenty-First Century* examines recent events and current times through a technological lens. He tracks the digitalization of information, and the resulting ripple effect on how work is done, who can do this work now, and how these changes affect local and global economies. His lens alerts readers to how digital technology is remaking the world around them in ways that they perhaps have not begun to realize. The questions that Friedman raises in his book concern how individuals, companies, educational systems, and countries will all need to adjust to this new technological reality.

Probably my favorite example of mentoring readers to reorient their thinking through a different disciplinary lens concerns, unsurprisingly, baseball. This disciplinary reformulation emerged about three decades ago in a manner that has revolutionized the understanding of baseball statistics. Baseball guru Bill James earned his revered standing among baseball fans by asking long-standing baseball questions (e.g., "What are the qualities of a good hitter?") and constructing answers through

a mathematical lens. His formulas often arrived at answers that were dramatically different from the conventional wisdom (e.g., he discovered that batting average is much less significant than power).

Throughout the 1980s, my spring ritual necessitated purchase of the year's *The Bill James Baseball Abstract*, as he offered provocative fresh looks at about every facet of the game. He wrote wonderful essays tweaked with mathematical reasoning, each concerning an elemental baseball question: "What influence do ballpark characteristics have on performance?" "How does speed contribute to a player's offensive value?" and "Who really deserved to win the Cy Young Award last year?" Eventually, James discontinued his yearly publications because baseball statistics had shifted so dramatically, largely because of his influence, that the baseball establishment was now employing his methods. Everybody now understood baseball through this new lens, and we see the influence today in the way statistics are reported and discussed (e.g., on-base and slugging percentages are much more meaningful indicators of a hitter's value). Indeed, several baseball team front offices began looking more intently at players' contributions through a mathematical lens, much to the disgust of old-time, chaw-chewing traditionalists. In 2006, *Time* enshrined James as one of the 100 most influential people in the world for remarkably transforming a sport by asking questions through a different disciplinary lens.

Each of the examples in this section pinpoint the role that questioning plays in disciplinary thinking, even when applied to areas not necessarily considered part of a discipline. Questioning is also central to mentoring students as readers through a disciplinary lens.

Inculcating an Inquiry Mind-Set

As discussed in previous chapters, students tend to regard the reading of disciplinary texts as *doing* reading: taking care of a task that has been assigned, typically by a teacher. In contrast, disciplinary insiders approach the texts of their discipline with a *using* reading mentality: using reading as a point of personal access to knowledge and ideas that can inform actions and address questions. Although both students and insiders might be engaged in reading obligation texts, perhaps the primary distinction is that students usually perceive their disciplinary reading as obligated by others,

whereas insiders tend to see their reading as obligated by themselves. As a result, insiders take an inquiring mind-set into their reading.

Reading as Inquiry

A critical facet of mentoring readers in the reading of complex disciplinary texts is nurturing the realization that reading is inquiry—of fostering a culture of reading to find out rather than reading to get done. As literacy researcher Wilhelm (2007) emphatically states,

The work of academic disciplines is inquiry. And the most recent research in cognition shows that reading and writing are forms of inquiry, and are best learned in contexts of inquiry (Hillocks, 1999, 2002) and through the questioning and discourse that is central to it.... That means that students must be the ones asking the majority of questions and doing the bulk of classroom talk. They must shake off the passive role of receiving information and become apprentices who actually do the work of the disciplines they are studying. (p. 10)

Essential Questions

In their influential guidebook for curriculum planning, *Understanding by Design*, Wiggins and McTighe (2005) posit the central role of essential questions for disciplinary learning. Essential questions target the big ideas of a discipline and cut right to the core of why we study a discipline. When we ask, for example, "How does a novel work?" we are engaging in a serious examination of how authors employ a specific text genre—literary fiction—to communicate to others. We can then consider, "How does this particular novel work?" as an entry into "What does this author have to say to us?" and "How does this author say it?" James was so influential because he not only brought a unique disciplinary perspective to baseball but also asked essential questions. "What are the qualities of a good hitter?" is a question to which every manager and team wants the best possible answer. You will notice that each chapter of this book leads off with an essential question.

Coverage and Activities. Wiggins and McTighe (2005) are highly critical of two trends that frequently preoccupy disciplinary instruction: coverage and activities. Coverage places the primary emphasis on brief and often superficial introductions to the topics of a discipline, under the guise of

needing to cover the curriculum, although much of this content is not retained over time.

Activities are attempts to motivate through the inclusion of fun activities and projects that may lead to an active classroom and a bustle of involvement but may not have much to do with deep learning. I am reminded of the colonial project that my sons undertook when they were in middle school, which culminated in an evening exhibition of the various projects completed by the students, and their apparently very talented parents. Some of the projects were thoughtful, some clearly showed meaningful research, and very likely students learned some things. Yet, I kept wondering as I strolled past the displays, how many students could provide insightful commentary to an essential question like “Why were the colonists so miffed at the British anyway?”

Characteristics of Essential Questions. Wiggins and McTighe (2005) instead argue for instruction that uncovers a discipline through essential questions that lead to deep and transferable understandings. The authors describe essential questions as

doorways through which learners explore the key concepts, themes, theories, issues, and problems that reside within the content, perhaps as yet unseen: it is through the process of actively “interrogating” the content through provocative questions that students deepen their understanding. (p. 106)

In effect, an academic discipline is defined by its essential questions. Figure 5.1 presents examples of essential questions from several disciplinary perspectives.

Figure 5.1. Examples of Essential Questions for Disciplinary Learning

- What are the benefits and harms of altering an area’s ecology?
- What does it mean to be fit?
- To what extent are people capable of governing themselves?
- What is the difference between music and noise?
- What is the impact of altering a recipe?
- How can stories about other people and times speak to my life?
- What makes a mathematical argument valid?
- What are the pitfalls of not following these directions as expressly stated?
- What influence can humans have on weather?
- What makes business practices ethical?
- Are there rules for art?

REFLECTION INTERLUDE

Consider a unit of study from the discipline that you teach. What are the enduring understandings—the big ideas that a literate person should still know after the passage of significant time, say, five years later? Now, frame these understandings as one or two essential questions that will guide students as readers and learners during this unit.

Essential questions exhibit a number of key characteristics. Obviously, they tend to elicit complex answers that result from concerted study within a discipline, and they are arguable. In fact, insiders within a discipline would have differing takes on how most of these questions might, or should, be answered. Essential questions are those that we come back to again and again throughout our life, as we keep working our understanding and responding to new knowledge; it seems that they are always under construction. Such questions offer bridges to our prior knowledge, as discussed in Chapter 3; an essential question should reach beyond the classroom and intersect with some elements of our out-of-school lives. Essential questions spark genuine inquiry into the topics of our disciplines and require deeper examination that involves weighing alternatives, evaluating evidence, and considering the case for multiple possible resolutions. Invariably, essential questions lead to more questions.

For example, “What should citizens expect from their government, and what should they provide for themselves?” is an essential question that has surfaced repeatedly in U.S. history and is still being heatedly debated today. This essential question might lead to the following points of inquiry:

- What is the sweet spot between individual initiative and government support?
- What are the advantages of tilting more toward individual initiative?
- What are the disadvantages?
- What are the advantages of more government support? What are the disadvantages?
- Who benefits in each possible scenario? Who does not?

- Whose voices should be heard on this issue?
- How should we as a people decide?
- How should changes be implemented?

Lots of questions, hard questions, that strike at the core of reading, writing, and thinking through a historian lens. These questions pop up again and again, from the early years of the republic, through the Populist, Progressive, New Deal, and Great Society eras in U.S. history, and on to today's contentious disagreements on national health care.

Leading Questions. Of course, essential questions are not leading questions, which tend to be the type of question most frequently aired in classroom settings. Leading questions imply an expected answer, and it is pretty clear to students that there are right and wrong responses to these questions. Leading questions have a sort of cut-and-dried quiz show dynamic about them: "Yes, you are correct" (a buzzer goes off), or "No, sorry, that is incorrect" (the audience sighs). A steady diet of leading questions conditions students to view reading, and learning in general, as the daily process of locating acceptable answers rather than thinking deeply within a discipline.

Essential questions instead lead to conversation—lots of it—and invite collaboration with others as we grapple with piecing together an understanding. To tackle such questions, we need to assemble and examine evidence that can support possible answers; we need to entertain sometimes conflicting interpretations of what the evidence might indicate; we need to continue to question, gather information, and refine our thinking; and finally, we need to be open to changing our understanding as time passes, and we gradually learn more. In other words, we need to behave the way insiders in an academic discipline behave. Harvey and Daniels (2009) contrast such an inquiry orientation with a coverage approach as the difference between "engaging in a discipline" and "hearing about a discipline" (p. 56).

Modeling Self-Questioning With Disciplinary Texts

That students should adopt a questioning disposition while learning disciplinary content is hardly a new notion for teachers. A wealth of research that echoes back to Durkin's (1978) landmark study on the dearth

of classroom comprehension instruction reveals a pervasive imbalance in daily questioning routines. She concludes that classroom questions are used almost exclusively for assessment of comprehension but rarely for the purposes of comprehension instruction. Questions are used to assess if students got it, but rarely are designed to help students get it. In many cases, as discussed in Chapter 1, worksheet and textbook questions are the vehicle for skimming for answers, not comprehension. The classroom drill that students have been conditioned to expect is still predominantly that the teacher asks the questions, and the students provide the answers.

An extensive body of research confirms that teaching students to generate their own questions about texts can significantly improve their comprehension (e.g., Dole, Nokes, & Drift, 2009; Duke & Pearson, 2002; National Institute of Child Health and Human Development, 2000). Chapter 2 identifies question generating as one of the major comprehension processes; proficient readers pose questions to themselves and authors while engaged in making sense. An important function of disciplinary learning is to transfer the responsibility of raising good questions from the teachers to the students. Yet professional development sessions that I have attended as a teacher have typically focused on the need for us as *teachers* to ask better questions—to extend our questioning beyond literal-level responding to spark critical thinking and higher level reasoning. I can recall exiting those sessions feeling a tinge of guilt, and maybe some defensiveness, and resolving to upgrade the quality of my questions. Yet, while our questioning practices do deserve attention, we somehow miss the point if questioning remains a domain of teacher behavior rather than a key responsibility of student behavior.

Instead, we need to retool our questioning routines so that we model the kinds of questions that insiders would pose when thinking through a disciplinary lens. Rather than merely asking better questions, we need to consciously focus on modeling better questions as a key dynamic of the Gradual Release of Responsibility, as presented in Chapter 1. The next section presents an extended example of modeling self-questioning using a teacher think-aloud as an instructional strategy.

Practicing Self-Questioning

If students are to be mentored to think like disciplinary insiders, then they need the mental models of good questions to ask and ongoing

deliberations as to why disciplinary insiders care about such questions. Students need plenty of practice engaged in questioning like disciplinary insiders as they read, share their thinking in conversation, interact with the processes of the discipline, complete assigned tasks, and synthesize their understandings, especially through writing. As a result, students will be able to progress from readers dependent on someone else's questions to independent readers who use their own questions to monitor their thinking and gauge their understanding of complex texts.

I can vividly recall my own painful adjustments as a reader when I encountered the reading demands outlined on college syllabi as an undergraduate at the University of Wisconsin–Madison. Like many of our students, I had experienced disciplinary reading in a highly orchestrated setting in middle and high school; I rarely read anything without the ever-present assigned set of questions, worksheets, study guides, or follow-up inquisitions. Someone else always did my questioning for me. What I got as a reader tended to be merely what I was asked for: often, low-level whos, whats, wheres, and whens. As a college reader, however, I was accorded virtually none of this teacher-directed questioning. I was completely on my own, staring down at the unaccustomed reading load that included extensive segments of complex disciplinary texts—often entire books—with the presumptions that I was totally independent, needed no scaffolding for my reading, could figure out exactly what I needed to achieve from my reading, and knew how to think when interacting with the authors of the various disciplines I was studying. I was expected to do the heavy lifting of comprehension unassisted, which meant that I had to generate my own questions about the texts I was reading.

I began my college career as a microreader: a slow, careful, laborious reader who tries to absorb everything. Had I majored in mathematics, this approach would have served me fairly well. However, I was a history and political science double major, and I could barely keep up with the voluminous reading expectations of my courses, even though I had always scored well above the 90th percentile on standardized reading tests. I was one of our best readers coming out of high school and had not been transitioned into independence; I was merely dropped into it. Gradually, I got the hang of how to read history, which was not the same as how to read political science. I began to question my texts, and by my junior year, I had become increasingly efficient at reading through a disciplinary lens.

I was fortunate that my grades did not suffer while I struggled, but I paid dearly in hours spent in laborious plodding, not quite knowing what to look for, so trying to retain everything. Of course, many college students experience frustrations as independent readers of complex disciplinary texts, their efforts culminating in disappointing grades or inadequate performance on college coursework.

REFLECTION INTERLUDE

I related my experiences adjusting to college-level reading demands, but how about yours? How do your experiences compare to mine? Can you think of instances when you really struggled with trying to figure out exactly what you should be looking for, what key disciplinary questions your reading should address? When did you begin to get a feel for reading through a disciplinary lens?

Questioning Disciplinary Texts

A major instructional shift for middle and high school teachers, then, is to empower students as active questioners who use the reading of complex texts to expand and refine their understandings of topics and ideas central to disciplinary learning. Such a shift begins with students tracking their own questions as readers of disciplinary texts. The baseline and ongoing question is “What are you wondering?” and the following are examples for extending this baseline question:

- ...about cancer cells?
- ...about Napoleon Bonaparte?
- ...about cubism?
- ...about the Pythagorean theorem?
- ...about the movement of weather systems?
- ...about cardiovascular activity?
- ...about a toddler’s interactions with playmates?
- ...about starting your own business?
- ...about the electoral college?
- ...about Edgar Allan Poe’s outlook on life?

It is perhaps a sad testimony to how far disciplinary instruction has strayed from an inquiry focus when teachers reply, “Nothing. My students will tell me they are wondering nothing.” Wondering implies curiosity and inquisitiveness. Wondering is predicated on caring enough to engage in deeper thinking and further exploration. Wondering is an opening to a willingness to learn more. Wondering is an expectation that at least some of your questions will be entertained. Also, wondering is hitched to identity; what we wonder is intertwined with who we feel we are, what we feel we need, and what we expect to use. Wondering like an insider is an investment in disciplinary thinking; we are inviting students to be receptive to expanding their identities and understand some parts of their world through a new disciplinary lens. That students may be resistant is hardly surprising, but our disciplines have much to offer our students. “I’m not wondering anything” unquestionably needs to morph into “One thing I have a question about is....”

Questioning and Frontloading

Hence, we have our instructional opening. Chapter 4 presents several frontloading strategies that elicit question generating. For example, the modeled version of the Confirming to Extending strategy (see pages 131–136) dedicates one phase of the process to questions that surface for students, which are recorded by the class in the “Inquiring: What We Are Wondering” box. Students then use their reading to confirm or revise prior knowledge and attempt to resolve their questions. A key instructional tactic for ceding responsibility for question generating to students is accountability: For example, “Everyone must write down two questions that a person might be wondering about the topic” in order to receive credit for doing the thinking of this phase. Initially, I like structuring this phase with partners so that their conversation can lead naturally into potential questions. When students ask, “What if I’m not wondering anything?” I reply, not sarcastically, “Then, think about things another person might wonder.” However, slipping into an inquiring frame of mind is nonnegotiable; every student needs to demonstrate having engaged in the important intellectual work of question generating.

You will notice that other frontloading strategies in Chapter 4 also directly elicit student questioning. The Science Connection Overview (see page 145) includes a phase for question generating. The Prediction and

Anticipation Guides (see page 137) are designed to spark curiosity and get students wondering about a topic so that they approach reading with an inquiring mind-set. The Possible Sentences and Story Impressions activities (see pages 143–145) cue students to start wondering about what an author will be telling them. The Comprehension Checkdown (see page 159) represents a set of monitoring questions that readers should be in the habit of asking themselves as they interact with an author.

Several other highly researched literacy practices for mentoring readers as self-questioners have been developed over the years and have application for disciplinary learning: Reciprocal Teaching (Palincsar & Brown, 1984), Question–Answer Relationships (Raphael, 1982, 1986; Raphael, Highfield, & Au, 2006), and Questioning the Author (QtA; Beck, McKeown, Hamilton, & Kucan, 1997). QtA in particular is an especially promising strategy for middle and high school learners.

Questioning the Author. This questioning routine is predicated on teacher modeling of queries directed to an author at various key junctures in a text (see Figure 5.2). These queries—questions targeting the author of a text—reinforce that reading is in many respects a dialogue between a reader and a writer. Students are constantly reminded that the author is a person who is talking to them, has certain expectations of them, and has obligations as a writer to fulfill. QtA prompts students to talk back and fully participate in the conversation.

Figure 5.2. Queries for Questioning the Author

- What is the author telling you?
- What does the author assume you already know?
- Why is the author telling you this?
- What is the point of the author’s message?
- What does the author want you to understand?
- What does the author apparently think is most important?
- How does the author signal this?
- How does this follow with what the author told you before?
- How does this connect with your previous knowledge or experience?
- What does the author say that you need to clarify?
- What can you do to clarify what the author says?
- Does the author explain why something is so?

Note. Adapted from *Questioning the Author: An Approach for Enhancing Student Engagement With Text*, by I.L. Beck, M.G. McKeown, R.L. Hamilton, and L. Kucan, 1997, Newark, DE: International Reading Association. Copyright 1997 by International Reading Association.

“
Students become much more successful at higher order comprehension and monitoring their comprehension as a result of participating in Questioning the Author.
”

—Duke & Pearson,
2002, p. 231

These QtA queries reflect comprehension-monitoring questions that all readers, as a habit of mind, should ask of any text within any academic discipline. QtA encourages students to view reading as an act of communication with another person. I have consciously edited my language when talking with students about texts; instead of “what the book said” or “what the article stated,” I now refer to “what the author said.” Books, articles, and stories are all inanimate objects. It is the author, a fellow person, who is speaking to readers.

Teacher Modeling. To introduce this comprehension strategy, teachers model QtA queries as think-alouds to provide students with a window into the teachers’ thinking as students work through an understanding of a text. The use of short texts that have relevance to the topics of disciplinary study is especially effective for modeling. Teachers can project a short text on a screen and proceed to demonstrate appropriate places to hit the pause button and consider a QtA query. For example, a science teacher might share a topical newspaper article and model the questioning process. The following is how a teacher think-aloud might unfold. Note the QtA queries that the teacher embeds throughout the think-aloud.

Questioning the Author Think-Aloud

Here is a 2010 article from *The New York Times* that I encountered recently: *They Crawl, They Bite, They Baffle Scientists* by Donald McNeil, Jr. Of course, I immediately have a question; I want to know, what is this author talking about? What is this nasty sounding creature that does these things and is baffling to scientists? I am also intrigued: What is the author going to tell me about why these creatures are confusing to experts like scientists? So, I take a quick look at the opening paragraph:

Don't be too quick to dismiss the common bedbug as merely a pestiferous six-legged blood-sucker. Think of it, rather, as *Cimex lectularius*, international arthropod of mystery. (p. D1)

Ah, bedbugs! So, what does the author want me to understand about bedbugs? I am going to be looking for that. What is the author telling

me here that seems important? OK, it looks like the author is cautioning me that although we think of them as common creatures, they really are quite mysterious. I wonder what makes them so mysterious? I will have to see what the author says about that. Is there anything the author says that I need to clarify? Well, there is a technical term here, *Cimex lectularius*, but that just looks like the science term for bedbug. There are a couple of other vocabulary words that people do not generally see. *Pestiferous*Arthropod is another science term; the author says that these creatures are six-legged and that they are bugs, so *arthropod* is likely the classification term for this kind of insect. I'll read the next paragraph:

In comparison to other insects that bite man, or even only walk across man's food, nibble man's crops or bite man's farm animals, very little is known about the creature whose Latin name means—go figure—"bug of the bed." Only a handful of entomologists specialize in it, and until recently it has been low on the government's research agenda because it does not transmit disease. Most study grants come from the pesticide industry and ask only one question: What kills it? (p. D1)

Well, I was right about *Cimex lectularius* being the technical term for bedbug; the author says it is Latin. What does the author assume I already know? The author mentions other insects but does not name them, so the author might figure that I know what some of these other insects are. Clearly, mosquitoes bite us, and I know some carry diseases. Flies walk on our food, and some also carry disease. Ticks bite both humans and animals and carry diseases. My cat once had ear mites, and many pets harbor fleas. I think also of ants walking across our food at picnics. I know that weevils and locusts eat crops. The author also seems to expect me to know who entomologists are. The author gives some clues, *specialize and study*, so these people must be scientists who study creatures like bedbugs. The author also assumes that I know what the pesticide industry is; *pest again and kills tell me enough here*. What does the author say that seems important here? Bedbugs do not carry diseases—that seems important—and I am inferring that it must be hard to kill them because that is what researchers want to find out. Maybe that is what is baffling to scientists: how to get rid of bedbugs. I will have to see if this hunch is correct.

Notice from this brief think-aloud transcript how a teacher models these periodic thinking interludes during reading to pose some of the QtA queries in order to work through an understanding. As teachers, we might take this thinking for granted, but many of our students just trudge on through a text and do not truly engage in a thoughtful conversation with an author. QtA queries stimulate an inquiring mind-set, as students are mentored to interrogate the author as they ponder their understanding. A teacher think-aloud needs to be fast-paced and engaging and tends to work best with short texts, such as excerpts from class materials or other topically relevant passages. Five minutes or so of intense modeling interspersed into the class routines provides students with the mental models for thinking as questioners of disciplinary texts.

Scaffolded Practice. The second stage of instruction engages students in the conversation; we are now teaching in the zone. It is now the students and the teacher who are working the text together. We ask students to read a short segment, and we pose appropriate QtA queries to them. As students verbalize what an author assumes they know, what an author regards as important, what an author wants them to understand, and what an author says that must be clarified, they receive the necessary guided practice to do this thinking independently. A brief example of teacher-student QtA work follows (note that you should mark an asterisk on the text where you, as the sample teacher, direct students to stop reading):

Questioning the Author Student Practice

Now it's your turn. Read the next segment and stop where you see the asterisk. Then, turn to your partners and talk about the question, What seems to be the author's point here?

Ask any expert why the bugs disappeared for 40 years, why they came roaring back in the late 1990s, even why they do not spread disease, and you hear one answer: "Good question."* (p. D1)

[After partners deliberate] So, what are your ideas? What point does the author seem to want readers to get here?

The ensuing conversation becomes a give-and-take consideration of what students think the author is up to in this point of the text. The teacher needs to reinforce that this question does not have a categorical, expected right answer but that students should have some ideas about what the author is driving at. Students might offer that this passage provides some reasons for why these insects are so mysterious, leading to inferences that maybe we do not know much about bedbugs because they do not really harm us and that perhaps we stopped studying them because they seemed to be in decline. Students then are directed to read the next segment, stopping at your next placement of an asterisk, to entertain the next QtA query that you have chosen. We can eventually cede more of this thinking to students working in partner dyads as they begin to internalize the questions that one should ask when striving for understanding.

Independent Application. We can then transition this process to more independent application through the written tasks we provide to students. I found myself reworking my worksheets and study guides so that QtA questioning was predominant. (For example, examine the Interactive Reading Guide on the Solar System on pages 254–256, and notice the frequent QtA wording in the prompts for student thinking.) Harvey and Goudvis (2007) have termed such written tasks as think sheets rather than worksheets, a semantic adjustment that emphasizes the deeper processing intended from student reading.

REFLECTION INTERLUDE

Consider a segment of a complex text that you might use to teach some facet of your discipline. What could a think-aloud look like using QtA queries? Determine at least three stopping points where you could pause and interject one of the QtA queries for modeling. Then, select three following chunks of text that can be followed by a QtA query for students to consider. Try to use at least five different QtA queries from Figure 5.2 in your modeling and student practice.

If we want students to develop the habit of asking these valuable comprehension-monitoring questions themselves, then they need to see QtA queries frequently and have plenty of practice considering them as an

integral facet of learning from disciplinary texts. Written tasks formatted with QtA questions not only check whether a student has comprehended but also actually model for students how to comprehend.

Self-Questioning Taxonomy

Over the years, teachers have heard a chorus of educational observers and researchers expressing concern about the depth and sophistication of classroom questioning practices (e.g., Duke & Pearson, 2002; Pressley, 2002b). Chapter 1 indicts low-level questions that encourage skimming for answers, a frequent student default behavior that does not lead to comprehension. Publishers have also been regular targets of criticism for the questions supplied in educational materials that we purchase. Students are disproportionately asked to name, identify, define, list, and state—what Raphael (1982, 1986) terms “right there” questions, as answers are expressly stated right there on the page and merely need to be located. In conversations with editors of educational materials (including an opportunity to serve as a contributing author of a literature series), I have been cautioned that text questions reflect feedback from teachers, who frequently complain about questions that are too difficult for students to complete as independent homework. The upshot of these concerns is that more thoughtful questions need to be entertained, and modeled, in supportive classroom settings rather than merely assigned as homework tasks.

Deeper Questioning

As teachers, we can all undoubtedly hearken back to our college days and our introduction to Bloom’s Taxonomy of Educational Objectives (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956). Bloom’s Taxonomy offered us a blueprint for our instructional planning by helping us conceptualize how thinking at progressively more sophisticated levels might be integrated into our work with students. Although created with teachers as an audience, Bloom’s Taxonomy can also be a powerful vehicle for mentoring student self-questioning. Table 5.1 displays an extension of the QtA strategy, which employs the revised Bloom’s Taxonomy (L.W. Anderson & Krathwohl, 2001) as a framework for prompting a deeper level of self-questioning. (Notice that the 2001 revision of Bloom’s has flipped the top two cognitive levels; Creating is now at the apex of the taxonomy.)

Table 5.1. Self-Questioning Taxonomy

Level of Thinking	Comprehension Self-Assessment	Focusing Questions	Comprehension Processes
Creating	I have created new knowledge.	How has this author changed what I understand?	• Synthesizing • Creating mental images
Evaluating	I can critically examine this author’s message.	What perspective or authority does the author bring to what he or she tells me?	• Inferring
Analyzing	I can explore deeper relationships of the author’s message.	How is this similar to (or different from) what I have heard or read before?	• Making connections • Determining importance
Applying	I can use my understanding in a meaningful way.	How can I connect what this author is telling me to understand something better?	• Making connections • Inferring
Understanding	I can understand what the author is telling me.	What does this author want me to understand?	• Determining importance • Inferring • Creating mental images
Remembering	I can recall specific details, information, and ideas from this text.	What do I need to remember to make sense of this text?	• Determining importance

Note. From “Modeling Self-Questioning on Bloom’s Taxonomy,” by D. Buehl, September 2007, retrieved April 20, 2011, from www.weac.org/news_and_publications/education_news/2007-2008/readingroom_modeling.aspx. Copyright 2007 by Doug Buehl. Adapted with permission.

Using author-directed queries, the Self-Questioning Taxonomy (Buehl, 2009a) cues thinking on all six cognitive levels:

1. Creating
2. Evaluating
3. Analyzing
4. Applying
5. Understanding
6. Remembering

In addition, each cognitive level is cross-referenced with the comprehension processes of proficient readers described in Chapter 2 (see Table 2.1, page 35). For example, thinking at the Understanding level invokes at least three comprehension processes: determining importance, inferring, and creating mental images.

Self-Monitoring

The Self-Questioning Taxonomy is an example of a metacognitive strategy; the focusing questions provide a protocol for students to monitor their own comprehension and trigger thinking that taps into deeper reading. The intention of the strategy is to prompt students to check in at all six cognitive levels with any text they are reading, using standard QtA queries such as "What does the author want me to understand?" "How can I connect what this author is telling me to understand something better?" and "How has this author changed what I understand?" The taxonomy questions are designed to transition students into independent readers who self-assess their comprehension and personally assume responsibility for expanding their thinking about an author's message.

So, if I modeled a personal comprehension self-assessment of my reading of the bedbug article discussed earlier, using the Self-Questioning Taxonomy, then I would demonstrate how to systematically check in at each level of thinking. The following is how a teacher think-aloud might unfold:

Self-Questioning Think-Aloud

Remembering: What should I remember from my reading? Two main ideas seem central: that bedbug infestation is on the rise and that we are not certain as to what to do about it.

Understanding: What does the author want me to understand? A major understanding seems to be that scientists need to learn much more about this insect, including why it has again become a major problem and how it can effectively be controlled.

Applying: How can I connect what this author is telling me to my personal understandings? An obvious area of connection for me is sanitary conditions of places where I might stay overnight, such as hotels or motels. One implication from the author is that I may need to adjust

my personal behavior and be more vigilant and aware when lodging elsewhere.

Analyzing: How is what the author tells me similar to or different from what I have heard or read before? My analysis here is focused on comparison: how the author's message compares with my prior knowledge and experience. I had read that bedbugs are coming back, but I did not realize that it was to this extent. The author's comments on the regulation of potentially lethal pesticides reveal a familiar controversy. A major issue here seems to be the contention between controlling the insect and the use of toxins that could have far-reaching health repercussions.

Evaluating: What perspective or authority does the author bring to this topic? The author is apparently a journalist, but no other identification is offered. He cites an impressive number of scientists and references organizations such as the Environmental Protection Agency and the Centers for Disease Control. He showcases a wealth of expert testimony. The article appeared in the Science Times section of *The New York Times* newspaper, which is a reputable source.

Creating: How has the author changed what I understand? My major realization is that a creature that has always seemed distant to my life, and more relegated to highly unsanitary conditions, may quite possibly become a reality with which I must deal. Bedbugs are no longer necessarily someone else's problem!

Notice how by asking myself each of the six focus questions, I triggered some additional facet of my comprehension. The goal for our students is to be likewise able to articulate comprehensive self-appraisals of their reading and cue themselves to engage in thinking at all six cognitive levels. As such, the Self-Questioning Taxonomy is an instructional practice that provides a vehicle for combining two critical facets of comprehension: self-questioning and deeper questioning of complex disciplinary texts. The taxonomy can be posted in the classroom or even provided to students as personal bookmarks, as well as integrated into partner and whole-class discussions of written texts. Students need to develop as a habit of mind the asking of questions that plumb the sophistication of complex disciplinary texts.

Discipline-Specific Questioning

The six generic focusing questions in the Self-Questioning Taxonomy are valuable prototypes for self-questioning. However, these questions are general and do not necessarily reflect the extent of questioning that insiders within an academic discipline would pose about the texts they read. We know that insiders within a discipline would ask more pointed questions at each level, reflecting disciplinary priorities, ideas, and discourse. Examining a science text through the perspective of a biologist, for example, will generate a different set of relevant questions than those asked of a literary work. Generic questions are an important starting point, but they do not take students far enough into reading through a disciplinary lens.

For example, consider the questions that would be germane to understanding a baseball game through the insider lens of a dedicated baseball fan. An insider seated in the stands who is engaged in understanding a game buzzes with relevant questions:

- How will the pitcher decide to handle this batter?
- Where should the fielders position themselves for this particular pitch? What are this batter's tendencies?
- How has this batter fared before against this pitcher?
- What should the next pitch be, given the previous pitches, at bats, and the immediate situation in this game?

A number of the questions would reflect baseball discourse:

- Will they call the hit and run on this pitch?
- Will they come inside with the high heat or go down and away?
- Would you instead go with a changeup?
- Can this batter hit to the opposite field?
- Given his low RBIs against southpaws, should they pinch-hit?
- Is it a good idea to take the extra base on the center fielder's arm?

Questions that would certainly be relevant from other perspectives are not pertinent to understanding the game the way a baseball insider sees it. For example, the following questions might be of great interest to a host of other individuals who are also enjoying the experience of an afternoon at the ballpark. Although worthy, these questions do not contribute to understanding the game of baseball through the lens of an insider:

- What type of fertilizer do the groundskeepers apply to ensure the durability of the ballpark grass?
- Who designed the team's logo?
- How do the variables of physics interplay with the trajectory of this fly ball?
- How much does the team mascot get paid?
- Why would players chew tobacco now that cancer risks are more evident?
- Is it more cost effective to schedule day or night games?
- What is the nutritional value of this bratwurst?

Although such questions would be tangential, irrelevant, or even laughable to a baseball insider, these sorts of queries potentially represent alternative ways of understanding the experience of a baseball game. The point is not that these questions are unreasonable but instead that these are not the right questions from an insider perspective. Insiders—knowledgeable and experienced observers within a specific domain of study—wonder about different things than outsiders do.

Using Discipline-Specific Taxonomies

An essential facet of thinking like an insider is question generating. Insiders within an academic discipline rely on posing a core of meaningful questions to guide their thinking and organize their understanding. For example, consider the following:

- What would be the questions that a doctor would ask to understand the state of a patient's health?
- What would be the questions that an auto mechanic would ask to understand the operating condition of a car?

- What would be questions that a meteorologist would ask to understand the coming weather?
- What would be the questions that a nutritionist would ask to understand a person's diet?
- What would be the questions that a financial consultant would ask when recommending investment options for a couple's retirement?

REFLECTION INTERLUDE

In Chapter 2, you identified several discourses of which you would qualify as an insider. Select one of your nonschool identities, such as a recreational identity (e.g., gardener, photographer). Jot down three or four insider questions that you would ask when you are engaged in thinking through this identity.

Following are several discipline-specific taxonomies that illustrate how a research-based generic literacy practice, QtA, can provide the foundation for questioning practices grounded in thinking through a disciplinary lens. Each adheres to the Bloom's Taxonomy framework, but each represents questioning through a different disciplinary lens. If students are to ask the kind of questions that insiders ask, then they need to be mentored by insiders—their teachers of academic disciplines—as they read, write, and think across the curriculum.

What does this process of mentoring look like? These taxonomy questions need to be infused into class conversations, activities, and assessments around the learning from disciplinary texts. Instruction should adhere to the Gradual Release of Responsibility progression toward independence discussed in Chapter 1.

- Disciplinary-specific questions need to be modeled through teacher think-alouds in conjunction with complex texts of a discipline.
- Students need frequent glimpses into these mental models of how insiders think when they engage in comprehension of the texts of their disciplines.
- Disciplinary-specific questions need to be the undercurrent of classroom questioning practices and need to surface constantly in class conversations and discussions of written texts.

- Disciplinary-specific questions need to permeate classroom written tasks, such as worksheets and study guides.
- Disciplinary-specific questions need to guide the assessment of student understanding of content concepts and topics.

Students become more accomplished with what is modeled and expected. If literal-level, location-of-information questions (i.e., get the facts) are emphasized, then that will be the extent of student comprehension. If disciplinary-specific questions are emphasized, then students will begin to exhibit reading, writing, and thinking through a disciplinary lens.

The taxonomies that follow provide teachers with questioning templates to foster student thinking as readers and learners within their disciplines. Obviously, not every question needs to be asked about every text; some questions will receive priority depending on the topic of study and the nature of the text. However, students should be cognizant of asking questions at all six levels about disciplinary texts that they are endeavoring to comprehend. Ultimately, the questions are intended to prompt and guide students into thinking through a disciplinary lens. If you are thinking like a historian, for example, then these are the questions that you are asking, and these are the understandings that you are seeking.

Clearly, not all disciplines are directly represented in these taxonomies, but these are presented as models that can be further fine-tuned and adapted by teachers to fit the thinking demands of texts of their disciplines. For example, world language teachers will find elements of the history and literary fiction taxonomies useful. Art teachers will find the history taxonomy especially pertinent for reading art history, as well as the taxonomy for technical texts. A high school instrumental music teacher informed me that she found aspects of several of the taxonomies relevant to her work in a music performance context, including the taxonomies for literary fiction (story behind the music), history (influence of the times on the composition), physical science (the physics of proper playing position in relation to sound produced), and technical texts (language of practice materials), as well as the music taxonomy.

Chapter 6 presents a number of examples that illustrate questions from these taxonomies embedded in various literacy practices with disciplinary texts.

Self-Questioning Taxonomy for History Texts

Historians, like experts in other knowledge domains, know a lot of facts; they know the whos, whats, and whens. Yet, they are more focused on using facts, on examining pertinent information to help them understand historical events, actions, and phenomena.

“

In the practice of history, texts are generally used in order to answer a question or analyze an historical problem, yet in classroom instruction the process is often reversed, with questions used to assess student comprehension of the text.

”

—Moje et al., 2011, p. 457

Insider questions guide historians, like other subject experts, into marshaling and organizing information so that they can make generalizations, develop interpretations, construct explanations, and draw conclusions. Historians broach questions to identify and evaluate the factual information. What do we know to be true, and how do we know it? What kinds of information would help us answer our questions, and how can we access it? Are we missing some information that could make a difference in our thinking? If so, where could we obtain this information?

Are multiple interpretations of the information possible? If so, what might they be?

Mandell and Malone (2007) have developed a framework for guiding students into the disciplinary questioning practiced by historians. The authors identify five critical questioning themes that frame historical thinking: cause and effect, change and continuity, turning points, using the past, and through their eyes.

Cause and Effect. Perhaps the most elemental question in studying history is “why”: What do we know to have happened, and why did this happen? “Why” questioning asks students to look for results, consequences, and effects and clarify reasons for these occurrences.

- What actions did people take, and what resulted from these actions?
- Did something change for people, and how did these changes affect them?
- Did people’s actions turn out the way they expected, or were some effects unexpected?

Change and Continuity. Historians are particularly interested in the dynamics of change. Living conditions change. Populations change.

Ideas change. Technology changes. This focus area asks students to be vigilant in tracking any variables that do not remain constant for people:

- What changed, and what remained the same?
- Why do some things change and other things remain much as they are?
- Was a particular change positive for some and negative for others?

Turning Points. Some events in history are hugely influential in determining the course of future events. Historians are especially tuned into these turning points when the future unfolds in a certain direction because of particular actions or changes:

- How were people’s lives different after this turning point?
- Were some people’s options and choices expanded and others narrowed?

Using the Past. As discussed in Chapter 3, one compelling reason for studying history is to gain insight into our present circumstances. Our experiences of today, of course, have their antecedents in the past:

- What are some similarities between current situations and past times?
- How can these similarities help us understand the present?
- Are there lessons from the past that we can apply to decisions we need to make today?

Through Their Eyes. A common flaw of historical study is to evaluate people through the biases of modern values and conditions. As a result, students can become quite judgmental but not terribly insightful.

- How did the past actually look to the people alive at a point in history?
- How did the reality of their lives and times influence people’s thinking and perspectives?
- How did people’s ideas and beliefs intersect with their behavior and actions?

Table 5.2 displays a Self-Questioning Taxonomy that mentors students to read history texts through a historian lens. As teachers model these prototypical questions, teachers are inculcating the kinds of thinking

Table 5.2. Self-Questioning Taxonomy for History Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created new knowledge about the past.	<ul style="list-style-type: none"> • How has this author changed what I understand? • Why does this matter to the author? To me?
Evaluating	I can critically examine this author's conclusions/interpretations/explanations.	<ul style="list-style-type: none"> • Who is the author and how has author perspective influenced the telling of this history? • What conclusions/interpretations/explanations does the author provide? • How did the author find out? What is the evidence? How can we evaluate this evidence? • What other conclusions/interpretations/explanations could be justified by the evidence? • Does the author have an attitude, and if so, about what? • Whose viewpoints are not presented? What might be their perspective?
Analyzing	I can understand why.	<ul style="list-style-type: none"> • What happened? What caused it to happen? • What changed and what remained the same? Who benefited from the changes? Who didn't? • How does the author talk about the effect of past decisions or actions on future choices?
Applying	I can use my understanding to better understand how the past influences my life and world.	<ul style="list-style-type: none"> • How can I connect my experiences and knowledge to what this author is telling me? • How does studying the past help me understand my life and my world?
Understanding	I can understand what the author is telling me about the past.	<ul style="list-style-type: none"> • What does this author want me to understand about the past? • What questions does the author ask of the past? • How did people in this time period view their lives and world?
Remembering	I can recall specific details, information, and ideas from this text.	<ul style="list-style-type: none"> • What do I need to remember to make sense of the past?

Note. From "Reading Like an Insider," by D. Buehl, 2009, Exchange, 22(1), p. 5. Copyright 2009 by Doug Buehl.
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that are central to history insiders. Instead of becoming immersed, and perhaps lost, in historical details, students are prompted to ask questions that lead them to consult the information to develop an interpretation of what these facts might mean.

The Self-Questioning Taxonomy for History Texts mentors readers to regard historical facts as critical pieces that can be assembled to reveal a larger understanding, rather than details that must be remembered in and of themselves. Granted, some facts constitute historical literacy; students will encounter references to such facts and be expected to make some meaningful associations. This information is elicited by questions at the Remembering level. However, such facts are memorable only in the context of larger understandings of history. For example, a student who confidently remembers Franklin Roosevelt as the president who initiated the New Deal, but who has no sense of what the New Deal was intended to accomplish and how it changed our country, has not achieved satisfactory learning about this period of U.S. history at the Understanding level.

History teachers who model these questioning protocols take students beyond superficial questions about historical information. Instead, students are cued, especially at the Analyzing level, to strive to discern what a pattern of factual details might mean, and students are guided to approach historical study as an inquiry process rather than a discipline that merely emphasizes the memory of historical details. In addition, students are encouraged to study history by connecting past events to an understanding of their lives and world with the focus questions at the Applying level.

A critical realm of historical questioning centers on authority. Notice the number of focus questions at the Evaluating level. Students read history that is a reflection of the ideas and perspectives of specific historians. Therefore, students need to bring a critical literacy awareness to their study of history:

- Who is offering this version of history, and what perspectives does this interpretation reflect?
- Are other perspectives available?
- What information is used as a basis for this historical perspective?
- What information is not used or overlooked?

As discussed in Chapter 3, historians read history as arguments, not as truth statements.

I relate in Chapter 1 that as part of my personal reading profile, I am currently immersed in Francis Parkman's multivolume *France and England in North America*. The focusing questions for thinking like a historian aptly describe the thinking that I have been doing as a reader of this history. I am seeking his explanations for why things have turned out the way they have, and I am actively evaluating his case by tracking the impressive array of evidence that he provides. I am recognizing the significant changes that at this point in my reading, the French, the Algonquins, the Hurons, and the Iroquois experienced. Also, I am ever conscious of Parkman's voice as a historian, reflecting on how his apparent beliefs, experiences, and perspectives influenced how he understood this period of history. I recognize that I am reading Parkman, the historian, just as much as I am reading a work of history. I realize that I have, as a habit of mind, factored in all of the questions from the taxonomy into my insider reading of this historical work.

As students are cued to engage in the thinking represented by these focusing questions, they become less inclined to conceptualize the study of history as a static, cut-and-dried retelling of events and more likely to view history as dynamic and open to reinterpretation. In particular, students gain practice in using factual information to develop and support their own generalizations, interpretations, explanations, and conclusions.

A particularly powerful strategy at this stage is to provide students with opportunities to do their own historical research, especially through the use of targeted primary sources. As students examine authentic documents of history, they not only put their own questions into play but also become sensitive to the process followed by historians as they attempt to understand historical phenomena.

Self-Questioning Taxonomy for Literary Fiction

Two different questioning scenarios come to mind when many of us think about our experiences with reading literary fiction in school settings. The first line of questioning focused on the facts of the story: what happened, where and when it happened, who did what, and who said what. These questions directed attention to the basic story grammar of a literary work: plot, character, setting, and action. The intention behind these questions

was apparently to assess our ability to follow the story line, although the questions often had the appearance of providing evidence to the teacher that students actually read the assignment. In particular, I recall chapter-by-chapter study guides that adhered to this approach as I waded my way through books like Mark Twain's *Adventures of Huckleberry Finn*.

The second line of questioning concerned theme and literary devices. These questions centered on what the story means and the hidden messages intricately positioned behind things that the author did or said. We were asked to notice the author in action and locate the use of language and literary devices, such as symbolism and point of view, to determine the author's theme. Yet, mostly we were asked to arrive at a standard interpretation and were guided toward or, even better, were explicitly taught the accepted understanding of a literary work. Hence, CliffsNotes appeal to many students; it saves time and struggle to just download someone else's understanding, allowing readers to rapidly skim over chapters to pick up the gist of the story line, or maybe not really read the book at all.

Yet the more essential questions focus on transcendent disciplinary considerations like the following:

- What can a reader get from reading a respected literary work such as *To Kill a Mockingbird* by Harper Lee?
- What advantages might there be in exploring our understandings of our world and our lives through a literary lens?
- How do we go about negotiating a meaning from texts that represent indirect communications, that are designed to be open to interpretation?
- What are questions that insiders ask to crack the meaning of literary fiction?

Table 5.3 represents a Self-Questioning Taxonomy for Literary Fiction that can be used by English and language arts teachers to mentor student questioning of short stories and novels. The questions for each level of the taxonomy are customized for thinking about how authors communicate through fictional literature.

Keep in mind that the focus questions of this self-questioning taxonomy are geared toward developing readers of literary fiction. Other

Table 5.3. Self-Questioning Taxonomy for Literary Fiction

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have developed an interpretation of what this story means.	<ul style="list-style-type: none"> • Why is the author telling me this story? • What theme or idea might the author be exploring in this story? • What does this story mean to me? • How has this author changed what I understand?
Evaluating	I can critically examine this author's story.	<ul style="list-style-type: none"> • Who is the author, and how has the author's perspective influenced the telling of this story? • What does the author's choice of words indicate about what the author might be thinking? • What emotions is the author eliciting? • Does the author have an attitude, and if so, about what?
Analyzing	I can notice how the author wrote this story.	<ul style="list-style-type: none"> • What literary techniques does the author use? • What seems to be the purpose for using these literary techniques?
Applying	I can use my life experiences to understand the author's story.	<ul style="list-style-type: none"> • How can I connect this story to my life and experiences? • Why might the author have the characters say, or do, this? • What point might the author be making about the characters' actions? • Why might the author place the story in this setting?
Understanding	I can understand what the author is telling me.	<ul style="list-style-type: none"> • How does the author have the characters interact with one another? • How do the characters feel about one another? • How do the characters' feelings and interactions change? • How does the author use conflict in this story? • How does the author resolve this conflict?
Remembering	I can follow what happens in this story.	<ul style="list-style-type: none"> • Who are the characters? • Where does the story take place? • What are the major events of the story? • What is the sequence of these events? • What event initiates the action of the story?

Note. From "Questioning Literary Fiction," by D. Buehl, November 2007, retrieved April 19, 2011, from www.weac.org/news_and_publications/education_news/2007-2008/reading_room_literary.aspx. Copyright 2007 by Doug Buehl. Adapted with permission.

forms of literature, such as poetry, drama, or essay, would require teachers to tweak this taxonomy to make the questions relevant to the literary form. Biography, a related nonfictional genre that shares some of the attributes of story form, tends to feature direct statements of author conclusions and viewpoints. Thus, although biographies also usually follow a story line and a narrative structure, English and language arts teachers, as well as history teachers, would need to adapt this Self-Questioning Taxonomy to reflect those questions that are most appropriate for reading biographies or autobiographies.

Following the Story. The comprehension self-assessment for the Remembering level reflects the basic components of story structure (i.e., "I can follow what happens in this story"), which leads a reader to pose a series of questions appropriate for tracking story elements. Certainly, following the story is a precondition for comprehension, especially when the narrative structure unfolds out of sequence, when the narration omits parts of the story, which must be inferred by the reader, or when the narrator (or narrators) cannot be trusted or offer differing versions of what has transpired. I am reminded of my personal struggles with trying to reconstruct the story line in William Faulkner's *The Sound and the Fury*, which is told in three versions, by three different narrators, one of whom is cognitively disabled and does not understand what he is witnessing, and the other two are concealing things. Yet, Faulkner was skillfully mirroring how stories often come to us in real life, piecemeal and through multiple sources, forcing us to assemble, and reassemble and often adjust, our understandings of what happened as we encounter more of the pieces and points of view.

Following the Characters. Questions at the Understanding level prompt students to pay careful attention to the characters and notice how characters get along with one another, how they feel about one another, and whether dynamics between them change—or as Foster (2008) would argue, what the characters reveal. Readers are especially cued to notice how the characters face conflict and how the author chooses to resolve this conflict.

Reader Perspective. At the Applying level, the focus questions engage students in exploring how their lives and experiences with people can be used to understand what is happening in the story. In *How to Read Novels*

Like a Professor, Foster (2008) addresses essential questions about how novels work, why they work the way they do, and how readers can go about navigating this genre in a manner that is rewarding and perhaps even enjoyable. In contrasting novels with texts that directly aspire to inform, explain, or argue, he cautions not to expect “heavy-handed reminders about what’s important. Overt message statements from the author” (p. 124). Instead, he notes, “That’s what novels do: they reveal. They’re not very good at explicating, at declaiming, or even at essaying. But they’re excellent at revealing” (p. 124).

So, what is it that novels actually reveal? It depends. What is revealed is hugely influenced by the reader; the author sets a story into a motion, and the reader fleshes it out. Foster (2008) describes reading as “an interaction between two imaginations, that of the writer and that of the reader” (p. 44). He continues, in this instance referencing the character Pip from Charles Dickens’s *Great Expectations*:

We each bring a great deal of our own lives, our own perspective, our own reading of other works, to each new novel that we’ll never see the same things. Your Pip can never be quite like mine, and not because I’m special. You and I know too many different things, entertain too many different thoughts, hold too many different beliefs to see Pip—or any character—in quite the same way. Same words, same pages. Different us. Sometimes, different me. (pp. 87–88)

We bring different life experiences to our reading, so our understandings will reflect different possibilities and interpretations. Literature also offers readers opportunities to extend from their life experiences and consider how they might react or respond—what some observers have called imaginative rehearsals for future life events. Literary fiction allows students to explore hard choices and sometimes harsh dilemmas through the safety of their imaginations.

Author’s Craft. Although the focus questions at the Analyzing level look relatively modest, they are the tip of the iceberg in examining author’s craft and lead students to be sensitive to how the author wrote the story. Although analysis questions are central to how literary fiction works, a word of caution is in order. Quite honestly, it is questions at the Analyzing level that have often driven many students to distraction when studying fictional literature, as they agonize over, for example, what a symbol means.

As both of my sons, who were devoted readers of choice fiction as high school students, complained, “Why can’t we just read the book?” Both would say today, as adult readers of more complex texts, that they appreciate a more in-depth look at author’s craft, but like many students, they felt analyzing could become a game of expected responses rather than a careful and open consideration of an author at work. Smith and Wilhelm’s (2010), Gallagher’s (2004), and Foster’s (2003) books are excellent resources for deeper investigation of literary elements and author’s craft at the analysis level. Teachers of literature will find numerous instructional applications from these sources that assist in questioning at the Analyzing level.

Author Perspective. Of course, literary fiction has much to reveal to authors as well as readers, which can make understanding a work of fiction a much trickier process for students. The focus questions at the Evaluating level help students continue to construct possible meanings of a literary work. Readers of literary fiction need to be conscious of the voice behind the keyboard, typewriter, pen, or quill and tune into perspectives, beliefs, and viewpoints that an author may be threading into the telling of the story. Readers of fiction need to be especially aware of emotional content that is displayed or elicited by an author. “Does the author have an attitude, and if so, about what, and how can you tell?” are especially useful questions to entertain at the Evaluating level. Did Harper Lee have an attitude about something when she wrote *To Kill a Mockingbird*? Did John Steinbeck have an attitude about something when he wrote *The Grapes of Wrath*? Did George Orwell have an attitude about something when he wrote *Animal Farm*? Students can readily relate to someone showing attitude.

Interpretations of Meaning. At the Creating level, the focus questions invite grappling with an author’s possible message as well as articulating what a story means to an individual reader. We probably can all recall interviews with authors of literary fiction who cannot really express why they wrote a particular piece, but it is fair for readers to ask, Why is the author telling me this story? If the author did not intend for others to read the work, then the author would have not sought to have it published. Sometimes as readers, we end up speculating more about the author than about the actual work.

Clearly, much of what an author says is intentional: the decisions on word choice, the particular form of the work, the specifics of the story,

and so on. Yet, once the process of writing begins, authors relinquish some of the control over where the story goes; as we tell our students, writing is an act of self-discovery. I certainly notice that my writing, which is not fiction, not only engages me in clarifying and probing my thinking but also leads me into deeper realizations about and insights into the topics I am exploring. (This book, for example, has led me into some unexpected directions in addition to what I had planned to say, and I have learned a lot through the writing.) To say this another way, writers do not totally own what a novel means. As Foster (2008) indicates, some authors obviously have specific ideas and themes that they examine through the telling of their stories, but for other authors, the stories emerge and do not necessarily intend to make significant statements about universal themes: "A lot of novels are happy merely to tell their story" (Foster, 2008, p. 114).

As a result, meaning cuts at least two ways. Presumably, a work of literary fiction was meaningful to the author, and searching for indicators of the author's meaning is part of the task of comprehension. However, as alluded to above, the reader also brings perspectives, beliefs, viewpoints, and experiences to the text, which necessitates a consideration of "What does this story mean to me?" At the Evaluating level, possible divergent interpretations of a literary work come into play in classroom conversations and other forms of booktalk.

Self-Questioning Taxonomies for Science Texts

A few years ago, shortly after I presented a literacy workshop for the teachers at my high school, one of the physics teachers visited me in my classroom. He arrived to take friendly exception to something I had said during the presentation: "thinking like a scientist." While agreeing that there are certainly significant similarities, and givens, among scientific folk, he argued that there are prominent differences between how physical scientists and biological scientists see, organize, and understand the world. "You should come to a science department meeting some time," he chuckled, "and see if you think there is great uniformity in thinking like a scientist."

Differences between the physical and biological sciences may be recognized through separate teaching licenses for teaching these disparate areas within science, especially at the high school level. Certainly, texts within these branches of science represent contrasting text structures, methods of organization, and most critically, discourse.

As a result, this section offers two questioning taxonomies, one designed for biological science texts and one for physical science texts. Table 5.4 presents the Self-Questioning Taxonomy to mentor students to read,

Table 5.4. Self-Questioning Taxonomy for Biological Science Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created new knowledge about the biological world.	<ul style="list-style-type: none"> • How has this author changed what I understand? • How has this author corrected my previous misunderstandings?
Evaluating	I can critically examine this author's conclusions/theories/explanations.	<ul style="list-style-type: none"> • What conclusions/theories/explanations does the author provide? • How do we know? What is the evidence? • What other conclusions/theories/explanations could be justified by the evidence?
Analyzing	I can understand why.	<ul style="list-style-type: none"> • What happened? Why did it happen? How did it happen? • How does this [biological concept] work? • Why does this [biological concept] work the way it does? • What are its defining characteristics? • How is this similar to (or different from) other related biological concepts?
Applying	I can use my understanding to better understand the biological world.	<ul style="list-style-type: none"> • How can I connect my experiences to what this author is telling me? • How can I use what this author is telling me to better understand living things? • How is what the author is telling me different from what I previously understood?
Understanding	I can understand what the author is telling me about the biological world.	<ul style="list-style-type: none"> • What does this author want me to understand about living things? • How does the visual information help me understand what the author tells me? • What do I currently understand about what the author is telling me?
Remembering	I can recall specific information and ideas from this text.	<ul style="list-style-type: none"> • What biological concepts do I need to remember for future understandings? • What biological vocabulary do I need to become comfortable using?

Note. From "Questioning Biological Texts," by D. Buehl, May 2008, retrieved April 20, 2011, from www.weac.org/News_and_Publications/education_news/2007-2008/readingroom_tax.aspx. Copyright 2007 by Doug Buehl. Adapted with permission.

write, and think like a biologist. Table 5.5 presents the Self-Questioning Taxonomy for physical science texts.

Table 5.5. Self-Questioning Taxonomy for Physical Science Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created new knowledge about the physical world.	<ul style="list-style-type: none"> • How has this author changed what I understand? • How has this author corrected my previous misunderstandings? • How do I see the world I live in differently now?
Evaluating	I can critically examine this author's conclusions/theories/explanations.	<ul style="list-style-type: none"> • What conclusions/theories/explanations does the author provide? • How do we know? What is the evidence? • How can we test these scientific principles? How can we collect our own evidence? • What do our observations tell us? • Are our observations consistent with the scientific principles we are examining? • What are possible limitations of our investigations? • What other conclusions/theories/explanations could be justified by the evidence?
Analyzing	I can understand why.	<ul style="list-style-type: none"> • What happened (or happens)? Why does it happen? How does it happen? • What process do objects go through? What happens at each stage of the process? • What are the relationships that cause each effect in this process? • How can we model this process? • How can these scientific principles be demonstrated?
Applying	I can use my comprehension to better understand the physical world.	<ul style="list-style-type: none"> • How can I connect my experiences to what this author is telling me? • How do these scientific principles explain the world I live in? • Where might I encounter these scientific principles in action? • How is what the author is telling me different from what I previously understood?
Understanding	I can understand what the author is telling me about the physical world.	<ul style="list-style-type: none"> • What does this author want me to understand about the physical world? • What do I currently understand about what the author is telling me? • Can I use my imagination to see what the author wants me to understand?
Remembering	I can recall specific information and ideas from this text.	<ul style="list-style-type: none"> • What scientific principles do I need to remember for future understandings? • What science vocabulary do I need to become comfortable using?

Conceptual Language. At the Remembering level, the biological and the physical science taxonomies both recognize the importance of deep conceptual understanding of recurring science vocabulary to comprehension of science texts. As discussed in earlier chapters, the discourse of science is usually a central variable in the difficulty that students have with understanding complex science texts. Both biological and physical science texts feature a great deal of carryover language, described in Chapter 3 as intratextual references. As a result, readers need to track incoming vocabulary that will be employed in communicating science concepts under study.

Science Misconceptions. A primary concern in science learning is the tenacity of student misconceptions, so both taxonomies prompt students to revisit their current understandings and revise these understandings as necessary. As van den Broek (2010) acknowledges, this is a particularly challenging enterprise:

A reader's misconceptions are especially problematic. Not only do new elements and relations need to be added to the reader's knowledge base but conceptual change also needs to take place. Existing elements and relations need to be removed or adjusted (22). Modification of existing knowledge is often more difficult than acquisition of new knowledge (11, 23). (p. 455)

As a reader of science, I am personally very aware that my understandings are likely to be incomplete or even in error. This is especially true of my text-to-world knowledge base. I am highly conscious of the personal need to use my reading to refine my knowledge. This need is taken very seriously in both science taxonomies. Students check themselves on this issue at three of the levels of self-questioning. Questions at the Understanding level ask students to inventory their current understandings of specific biological or physical phenomena, whereas questions at the Applying level elicit comparisons of current understandings with the new learning. Questions at the Creating level ask students to verbalize how a text has transformed previous misunderstandings (i.e., almost literally, "I used to think...but now I understand..."). In effect, students are cued to remind themselves that they, like most people, often hold naive, incomplete, or erroneous ideas about the scientific world and that as learners, we need to constantly monitor the need to adjust or replace our current understandings.

Visualizing Abstract Texts. A distinction between the science taxonomies emerges at the Understanding level, which reflects research that indicates that visualizing and using visual representations of science concepts is central to comprehension of physical science texts (i.e., T. Shanahan & Shanahan, 2008). Transformation of the often abstract language of the prose into visual displays that are more concrete is especially important for physical science and is also elicited for this taxonomy at the Analyzing level, with questioning on how certain concepts or principles might be modeled to exemplify the processes involved.

Biological texts are even more extensively visual, often devoting as much as half a page or more to illustrations, photographs, and other visual information. For biological texts, students are prompted to use this vast array of visual communication to more deeply understand the science prose, to in effect go back and forth between what is said in the paragraphs, or even sentences, and what is presented in the visuals.

Cause and Effect. Both science taxonomies emphasize discerning cause–effect relationships at the Analyzing level, with questioning that revolves around explaining why and how. I have found that tracking cause–effect dynamics is a powerful tool for reading complex science texts. For example, when working with students preparing for the Science Reasoning subtest of the ACT college entrance test, a task many students do not fare well with and quite frankly dread, I have focused their thinking on cause and effect by looking for “What happens (or happened) and why?” or “What would happen if...?” I have also engaged them in coding the text, marking with a *C* every part of a sentence that represents a cause of something, and marking with an *E* every subsequent effect they can locate. Students are sometimes stunned to notice that they are marking cause–effect relationships in nearly every sentence, especially in physical science passages. (See page 234 in Chapter 6 for an example of science text coding.)

In contrast, biological science texts also emphasize concept/definition text structures, so that taxonomy cues students to establish the defining characteristics that identify a biological concept. Biological science engages readers in classifying and describing, in addition to establishing how an organism works and why it works the way it does (cause and effect).

Interpretations and Evidence. Both science taxonomies are concerned at the Evaluating level with how an author communicates a conclusion, theory, or explanation and what evidence is presented to justify these interpretations of biological life or physical phenomena. Readers need to monitor the logic of scientific claims given the evidence provided. Questioning for physical science texts also encompasses the frequent extensions from the text into experimentation. Hence, several questions for physical science ask students to evaluate experimental thinking: how principles in the text can be tested and observed. Of course, some portions of physical science texts are directly dedicated to describing and guiding experimental work by students.

Self-Questioning Taxonomies for Mathematics Texts

There is a basic irony afoot when talking about reading mathematics texts. On the one hand, as discussed in previous chapters, students do not necessarily think of engaging in reading in mathematics contexts, or certainly engaging in anything resembling extended reading. On the other hand, the reading of mathematics texts is usually an intense enterprise.

As discussed in Chapter 3, there is a significant disparity between conceptual and procedural knowledge for many students learning mathematics. As a result, students tend to regard mathematics texts primarily as problem-solving resources: As readers, students expect to encounter a series of prescribed steps that will enable them to successfully solve assigned problems. Thus, the main task of mathematics learning becomes for students merely an issue of remembering specific algorithmic routines to kick in when faced with problems of a certain nature.

However, the conceptual understanding of why the procedure makes sense mathematically may be hazy and not truly internalized, as the Common Core State Standards for Mathematics (NGACBP & CCSSO, 2010b) observe: “One hallmark of mathematical understanding is the ability to justify, in a way appropriate to the student’s mathematical maturity, why

“
Mathematics is not primarily a matter of plugging numbers into formulas and performing rote computations. It is a way of thinking and questioning that may be unfamiliar to many of us, but is available to almost all of us.”
”

—Paulos, 1995, p. 3

a particular mathematical statement is true or where a mathematical rule comes from" (p. 4).

In other words, explaining why is an essential component of comprehension of mathematics concepts, although students may be preoccupied with grasping how to apply various mathematical procedures. Instead of reading, writing, and thinking through a mathematics lens, students may be immersed in determining the right steps to follow to arrive at the correct answer. Reading through a mathematics lens, however, expands far beyond acquiring the procedural knowledge involved in problem solving. As Battista (1999) observes,

Mathematics is first and foremost a form of reasoning. In the context of reasoning analytically about particular types of quantitative and spatial phenomena, mathematics consists of thinking in a logical manner, formulating and testing conjectures, making sense of things, and forming and justifying judgments, inferences, and conclusions. (p. 428)

As a result, this section presents two Self-Questioning Taxonomies for reading mathematics: one for conceptual understanding (see Table 5.6) and one for procedural understanding (see Table 5.7). However, these two types of mathematics domain knowledge, conceptual and procedural, are often intertwined within mathematics texts. Some portions of a mathematics chapter, for example, may emphasize conceptual understanding, which may proceed to further elaboration that outlines the corresponding procedural knowledge. In a number of respects, readers must read mathematics through a dual set of lenses: understanding the mathematics at a conceptual level and applying the concepts using mathematics procedures. Hence, considerable teacher modeling of these Self-Questioning Taxonomies, especially through think-alouds directly applied to reading mathematics texts, will be necessary (e.g., the mathematics think-aloud presented in the Compacted Prose section of Chapter 2).

There is a constant interplay between the focus questions of these two taxonomies, and students will need much mentoring in determining which taxonomic question set is most appropriate for guiding their thinking at any particular point when reading mathematics texts. In essence, students need to realize when to emphasize *why* thinking and when to emphasize *how* thinking.

Table 5.6. Self-Questioning Taxonomy for Mathematics Conceptual Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created new knowledge.	<ul style="list-style-type: none">• What do I understand now that I did not understand before about mathematics?• How does this concept help me think mathematically?
Evaluating	I can critically examine this mathematics concept.	<ul style="list-style-type: none">• Why is this definition needed? What can we do with this concept?• How does the author use the concept in mathematics problem solving?• What kinds of problems can I solve using my understanding of this concept?
Analyzing	I can follow the logic of what the author tells me.	<ul style="list-style-type: none">• What are the defining characteristics of this concept?• How can I explain why this concept makes sense?• How does this concept relate to other mathematics concepts that I have learned?
Applying	I can use my mathematics understanding in some meaningful way.	<ul style="list-style-type: none">• Where in my life might I encounter this mathematics concept?• What are some examples of this mathematics concept from my life?• How can I use this concept to describe, inform, or explain some part of my life?
Understanding	I can understand what the author is telling me.	<ul style="list-style-type: none">• How can I explain the mathematics concept? In mathematics language? In everyday language?• How can I use visual information (e.g., diagrams, pictures, graphs) of the concept to understand its definition?• What examples of this mathematical concept does the author provide?
Remembering	I can recall specific terms and mathematics concepts presented by the author.	<ul style="list-style-type: none">• What mathematics vocabulary does the author introduce?• What definitions does the author provide for new mathematics concepts?• What are the undefined terms (e.g., <i>whole number</i>, <i>point</i>, <i>line</i>, <i>plane</i>, <i>group operation</i>, <i>set</i>) in the definitions?• What previous mathematics learning do I need to review to make sense of the definitions?• What do the symbols and notation mean in the definitions?

Table 5.7. Self-Questioning Taxonomy for Mathematics Procedural Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created new knowledge.	<ul style="list-style-type: none"> • How can my understanding be used to describe, inform, or explain information, objects, or situations in a mathematical way? • How have I expanded my ability to create solutions using mathematics?
Evaluating	I can monitor my effectiveness in applying this problem-solving procedure.	<ul style="list-style-type: none"> • Do the example problems make sense when I examine them? • What results have I obtained from applying the problem-solving procedure? • How close is the result to what I predicted or estimated? • What confusions did I encounter during problem solving? • What actions can I take to overcome any confusions that I might have?
Analyzing	I can follow the logic of what the author tells me.	<ul style="list-style-type: none"> • What is the logical reasoning justifying the mathematics statement? • How can I use this statement to explain mathematical facts that I already know to be true? • How can I use this statement as proof? • How can I link this statement to similar mathematics statements that I have learned? • Is the converse of the statement (i.e., if B then A) true? • What predictions or estimations do I have when I am problem solving?
Applying	I can use my understanding for solving mathematical problems.	<ul style="list-style-type: none"> • What kinds of problems can I solve using this mathematics statement? • How can I apply this problem-solving procedure to a variety of problems? • What are similar mathematics statements that I have previously learned?
Understanding	I can understand what the author is telling me.	<ul style="list-style-type: none"> • How can I explain the mathematics statement in the form "if A then B"? • How can I rephrase the statement using other symbols or other notation without changing the meaning?
Remembering	I can recall specific terms and mathematics procedures presented by the author.	<ul style="list-style-type: none"> • What mathematics vocabulary does the author use? • What are the symbols, notations, and definitions of the terms used? • What mathematics statement (e.g., formula, theorem, rule, principle) does the author introduce? • What problem-solving procedure does the author introduce? • What are the steps I need to follow in this problem-solving procedure?

Previous Mathematics Learning. There is growing variation in the nature of mathematics texts that reflects different approaches to mathematics learning, from more traditional texts, to integrated mathematics programs, to texts that focus on mathematics investigations. When mentoring students as readers of most mathematics texts, self-questioning toward conceptual understanding, often the missing link in comprehension, should probably come first. Notice in Table 5.6 the number of questioning prompts at the Remembering level, which underscores how much of mathematics understanding is predicated on previous mathematics learning. Students are cued to pay careful attention to new vocabulary and be sensitive to undefined terms, which will represent assumed mathematics knowledge. New mathematics vocabulary tends to be defined and explained using previously learned terminology, which mandates clarifying all undefined terms. In addition, students frequently have to translate prose language into symbolic notation.

Explaining Understanding. Focus questions at the Understanding level engage students in verbalizing their understandings, both using mathematics discourse and paraphrasing conceptual understandings into more everyday language. Students not only need to talk the talk of mathematics but also engage in conversations about mathematics that reveal deeper understanding, not mere parroting of math talk. In addition, students are reminded to factor in visual information and relate diagrams, illustrations, graphs, or other visuals to the prose of the text. Students explore the new concepts at a deeper level at the Analyzing level, which asks readers to grapple with why: why this mathematics concept makes sense given logic and previous learning. Rather than focus merely on "this is what it is," students are asked to question why this might be so.

Students are asked to seek ways to ground the concept in circumstances of their lives and world at the Applying level and asked to connect the concept to mathematics problem solving at the Evaluating level. Authors tend to signal how a specific concept relates to understanding some facet of the world around us through a mathematics lens, sometimes through explicit statements and other times through the contexts of application exercises

“
Researchers...recommend that students understand the logic of stipulated definitions [and] examine carefully how theorems and proofs are worked through in the examples to be sure they understand the underlying logic.”

—Lee & Spratley, 2010, p. 14

and problems presented for students to put their conceptual knowledge into play. For example, Paulos (1995) examines typical newspaper fare, which he then dissects with the tools of mathematics in order to clarify, qualify, and sometimes offer alternative interpretations of reported information.

Assertions of Truth. The Self-Questioning Taxonomy for Mathematics Procedural Texts displays some similarities to the Self-Questioning Taxonomy for Mathematics Conceptual Texts, particularly with deconstructing mathematics language, but extends consideration into mathematics principles, formulas, rules, theorems, or other assertions of mathematical truths. Students are engaged in verbalizing mathematics statements at the Understanding level and explaining the logic of a statement, given previous mathematics concepts and principles at the Analyzing level. The focus questions in this taxonomy much more directly assume readers' interaction with the new ideas as they examine the procedural examples and explore using problem-solving procedures that are introduced in the text, especially at the Evaluating level. At the Creating level, students are asked very specifically to translate their new learning into thinking through a mathematics lens, as they are prompted to ponder how these understandings may describe, inform, or explain information, objects, or situations in mathematical ways.

Self-Questioning Taxonomy for Technical Texts

The increase in technology in our everyday lives has led to a corresponding increase in our exposure to technical texts, from do-it-yourself booklets, to software's help websites, to product manuals, to detailed instructions and other such resource materials. In Chapter 3, I refer to the reading that we must do when interacting with technical texts as hands-on reading; there is an assumption by the author that we will be actively engaged in applying our understanding to some task, literally as we read along. Our reading is presumed to be action directed. We read a portion of the text, stop and perform that facet of the task, read the next portion, complete the next function of the task, and so forth until we have completed the process and achieved our end result. There is a good chance that we have experienced impatience, frustration, and perhaps

anger as we worked toward an understanding through technical texts with which we may be somewhat mismatched, as detailed in Chapter 3.

Table 5.8 is a Self-Questioning Taxonomy for Technical Texts, which could be used by teachers of applied technology, engineering, business, family and consumer education, physical education, and other related disciplines.

Table 5.8. Self-Questioning Taxonomy for Technical Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created a product or completed a task.	<ul style="list-style-type: none"> • What have I been able to create or accomplish? • How can I use my understanding in future applications?
Evaluating	I can critically examine my completion of this task.	<ul style="list-style-type: none"> • To what extent have I been able to apply my understanding to complete the task? • To what extent have I been able to meet the author's expectations? • To what extent does my application of the author's instructions achieve the intended final outcome?
Analyzing	I can examine the text and determine what I need to do to accomplish the task.	<ul style="list-style-type: none"> • What is unclear to me? What can I do to problem-solve my lack of understanding? • What visual information does the author provide? • How does the visual information help me visualize (i.e., create a mental model) of what I need to do? • How do the visuals connect to written portions of the text? To unfamiliar vocabulary? • What might happen if I do not follow specified procedures?
Applying	I can use my previous experiences to understand procedures and instructions.	<ul style="list-style-type: none"> • How can I connect my previous experiences to performing this task? • What must I read especially carefully? • What help does the author provide for understanding key terms? • What can I do to develop an understanding of unfamiliar terms?
Understanding	I can understand how to follow the procedures and complete the task.	<ul style="list-style-type: none"> • What is the task that I need to accomplish? • What should the final outcome look like? • Can I imagine myself completing the procedures the author describes?
Remembering	I can follow the author's instructions.	<ul style="list-style-type: none"> • What steps do I need to follow? • What key terms are used? • What do I remember about these key terms?

Of course, not all of the texts of these disciplines are technical texts, but a number of these disciplinary texts will exhibit features of technical text. The Common Core State Standards for Literacy (NGACBP & CCSSO, 2010a) also include design and other workforce-related subjects, as well as the technical aspects of art and music, in their designations of technical texts.

Teachers in technical disciplines will frequently witness students attempting to complete the task with only a superficial read or without reading at all. In addition, students may lobby for the teachers to tell or show them what they need to know, without developing any capacity for independently accessing necessary technical information themselves. Therefore, teacher modeling using these taxonomy questions as a walk-through to thinking through a technical lens is an imperative with texts of this nature.

Visualizing Technical Language. At the Remembering level, students isolate key vocabulary that guides their actions, review their understanding of those terms, and gain an overview of the steps that they will be expected to follow to complete the task. This is a critical starting point, as lack of facility with technical terminology is a primary frustration when attempting technical reading. A key comprehension process at the Understanding level is visualizing; students have to be able to see themselves confidently undertaking the actions that are described or prescribed at each stage of the process. Students need to imagine what the end product or result will look like and to imagine themselves doing what they are reading. Usually, technical texts feature significant visual information to assist readers with imagining the process; students are directed at the Analyzing level to examine visual information and relate the diagrams, illustrations, or other visuals to the written portions of the text.

Knowledge and Experiences. Focus questions at the Applying level go beyond simply applying the text to the task. Readers are also cued to apply relevant background knowledge and experiences to their understanding. Authors of technical texts tend to assume that readers have already logged experiences with related tasks and are generally familiar with technical terminology; hence, these texts tend to be terse and all business, written in a straightforward manner and providing just enough concise language to help the reader complete the desired task. At the Evaluating level, students are asked to judge their results in comparison with their expectations and the author's instructions. At the Creating level, students

track what they have been able to accomplish as well as acknowledge the procedural know-how that they have gained, which can be applied to future applications of the processes outlined in the technical text.

Self-Questioning Taxonomy for Music Performance Texts

Can you read music? At first glance, this strikes one as a fairly uncomplicated question; if handed a sheet containing lines of musical notation, could you translate the symbols into a melody? For most of us, reading music probably conjures up notes on a staff, flats and sharps, clefs and keys, accents and Italian commands, *accelerando* through *pianissimo*. However, to borrow a refrain from the legendary vocalist Peggy Lee, "Is that all there is...to music?"

A musician, of course, will tell you that there is a whole lot more to reading music than singing or playing the notes. Obviously, what is on the page matters, but how a musician understands a piece can elevate measures of symbolic notation into something more profound: a communication—music. Performance with understanding is predicated on a musician's knowledge about a particular musical work, its composer, and the context of the work's creation. Music performance classrooms, such as band, orchestra, and chorus, emphasize developing technical competence in music: facility with a musical instrument or one's voice, reading musical notation, and contributing as a member of an ensemble. Interpretation of a piece requires an additional layer of learning, developing an understanding that reaches beyond the notes and explores the story behind the music.

Students in music performance classrooms are quite naturally preoccupied with playing their instruments or singing. Typically, students do not associate reading and writing activities with becoming more accomplished musicians. The Comprehensive Musicianship Through Performance (CMP) model (O'Toole, 2003) offers a coherent framework for instilling in students that reading music involves getting a read on a piece that transcends reading notes: You can merely play notes, or you can play music.

Musical Selection. Initially, music teachers examine the role that a particular piece assumes in their curriculum. In addition to considering the quality, difficulty, and feasibility of a selection, the CMP model encourages teachers to decide how the piece contributes to a balance in the curriculum in terms of factors such as historical period, musical genre, and musical form. An orchestra teacher choosing Pyotr Tchaikovsky's

1812 Overture, for example, is selecting a work that will build student background about music from the Romantic Period and about the specific orchestral genre of concert overture. A vocal teacher, in choosing the spiritual “Nobody Knows the Trouble I’ve Seen,” is focusing on an American work from the 19th century within the genre of gospel music.

Musical Context. A second component of the CMP model, analysis of the piece, engages teachers in fleshing out a story line for the music. Some of this analysis is contextual:

- What was the historical time period when the piece was written, and how might the times have influenced this music?
- What were prevailing musical forms, and to what extent was this piece consistent with them?
- What do we know about the composer, and was the piece characteristic of this individual’s work?
- Why was the piece written, and for whom?
- What other cultural connections might be relevant for performing this piece with understanding?

Technical Analysis. Analysis also has a technical aspect: to encourage students to explore the musical decisions made by the composer to achieve a specific effect. At one level is awareness: How did the composer use the elements of music, such as form, rhythm, melody, harmony, timbre, texture, and expression? At another level is intent: Why did the composer make these particular musical choices?

Literacy Strategies. The CMP philosophy encourages instruction that integrates literacy strategies into the music performance curriculum as students examine the pieces that they are learning to perform. A band teacher, for example, interjects learning about the blues into the practice regime for rehearsing the “St. Louis Blues March.” A short excerpt from a biography of W.C. Handy, the composer of this musical selection, introduces an important blues figure to the band students. A clip from a documentary about Beale Street in Memphis builds additional student background, as students begin to connect the song that they are learning to the experiences of black Americans over a century ago. Students listen to various ragtime recordings and reflect in their journals about the emotions

that they discover in these pieces. Also, they investigate how the composer manipulated the elements of music—form, rhythm, melody, harmony, timbre, texture, and expression—to craft a musical communication.

The Self-Questioning Taxonomy for Music Performance Texts is infused with prompting thinking that emanates from the CMP model (see Table 5.9). Some of the questions, particularly at the Remembering and

Table 5.9. Self-Questioning Taxonomy for Music Performance Texts

Level of Thinking	Comprehension Self-Assessment	Focusing Questions
Creating	I have created an interpretation of this music.	<ul style="list-style-type: none">• What might the composer be telling listeners through this music?• How can my performance communicate this music to my listeners?
Evaluating	I can critically examine my performance of this music	<ul style="list-style-type: none">• What expectations does the composer have for the musicians playing (or singing) this piece?• How have I met the composer’s expectations?
Analyzing	I can understand how the composer created the musical effects of this composition.	<ul style="list-style-type: none">• How does the composer use the elements of music (i.e., form, rhythm, melody, harmony, timbre, texture, expression)?• Why did the composer make these particular musical choices?
Applying	I can use my understanding to perform and appreciate this music.	<ul style="list-style-type: none">• How can I connect my experiences to performing this music?• What emotional responses to the music does the composer seem to be indicating?
Understanding	I can understand the background of this composition.	<ul style="list-style-type: none">• When did the composer write this piece, and how might the times have influenced this music?• Why did the composer write this piece, and for whom?• What do we know about the composer, and was the piece characteristic of this individual’s work?
Remembering	I can follow the composer’s instructions.	<ul style="list-style-type: none">• How has the composer indicated that this piece should be performed?• What attention do I need to pay to time signatures, key signatures, note values, dynamics, tempo markings, and pitches?

Note. From “Connecting Music to Literacy” (p. 300), by D. Buehl and W. Buehl, October 2008, paper presented at the Wisconsin School Music Association Conference, Madison. Copyright 2008 by Doug Buehl and Wendy Buehl. Reprinted with permission.

Analyzing levels, are targeted toward careful examination of the music; some of the questions, especially at the Understanding level, involve reading behind the music to gain insight into the composer, the genre, and the musical period; and some of the questions, generally at the Applying and Evaluating levels, monitor performance of the piece. At the Creating level, questions target music as communication, as students develop their interpretations of a piece, considering both composer intentions as well as their own choices as musicians to bring meaning to their performance.

The CMP model advocates that as students become more skilled in performing, they will become more knowledgeable about music. The Self-Questioning Taxonomy envisions a music performance classroom where most of the class time is occupied with rehearsal activities. Yet, the model also argues for interspersing throughout the rehearsal routine sidebars of instruction that engages students in developing the knowledge that will guide them in interpreting the music as well as effectively playing or singing the notes. The folk traditions inherent in the choral classic “The Water Is Wide,” the confident outlook of imperial Great Britain embodied in an Edward Elgar Pomp and Circumstance march, the supernatural connections suggested by the Russian master Modest Mussorgsky in his eerie “Night on Bald Mountain”—all represent a rich vein of study as students become more insightful about the music that they are learning to interpret.

PARTING THOUGHTS AND TALKING POINTS

- Students need to be frequently provided with instructional activities that engage them in generating questions, rather than merely receiving questions, and in reading to use written texts to resolve their questions.
- The teacher role needs to evolve from question asker to question modeler. Teacher-generated questions, in both class interactions and student tasks, need to model the kind of questioning that we would like students to assume.
- Questioning the Author and the Self-Questioning Taxonomy are both promising instructional practices that model potent self-questioning routines for students; both are designed as general questioning

strategies that facilitate the transition to independent reading and self-monitoring of personal comprehension.

- The deeper we study a discipline, the more our questioning is transformed from generic to disciplinary-specific queries; insiders within a discipline pose a line of questioning that has coherence and relevance according to the practices and ideas of that discipline. To a significant degree, thinking through a disciplinary lens is questioning from a disciplinary perspective.
- If students are to raise the kind of questions that disciplinary insiders ask, then they will need ongoing practice with exploring such questions. Students will need frequent modeling of the array of questions presented in the different Self-Questioning Taxonomies, demonstrated through teacher think-alouds, embedded in class conversations and discussions, emphasized in student tasks and written responses to texts, and gradually elicited from the students themselves, especially as readers.

Instructional Practices for Working Complex Texts

Essential Question: How can instruction scaffold the reading of complex disciplinary texts?



What do you do when you have to work a text, that is, when you really have to work a text? When you are unable to avoid reading it or cannot depend on someone else telling you what it says, what do you do to understand a problematic text? Take a moment and consider times when you were presented with this dilemma. I present a personal example in Chapter 2 of a complex text that I needed to work, the Renaissance music liner notes, but I can think of a multitude of times when I have been confronted with the need to work a text: digging into investment documents, picking through the legalese in an insurance policy, deciphering medical information such as medication stipulations, following unfamiliar procedures presented in a technical resource such as a cell phone booklet, and even crunching the occasional research article dripping with jargon and statistics-speak. I have at times dipped my toe into unfamiliar science terrain, such as sampling texts that describe how the brain functions. Sometimes, even my choice reads may need to be worked. I have tackled enticing but somewhat inscrutable-appearing

poetry and taken on authors who exhibit a more philosophical bent to their musings. I even had to work a recent Christmas present from my son Christopher, a bulky novel by the classic Russian author Fyodor Dostoevsky. Working a text means you do whatever you need to do to get whatever you need (or want) from the text.

Very likely, we would all prefer to pick up a text and just read it, without any nicks in our flow of

“
The message from [the] research is unequivocal: skilled readers know how to select and apply comprehension strategies where and when they need them to comprehend.
”

—Conley, 2009, p. 531

understanding, without the thud of incomprehension, without the stark realization that what you have just read is not making any sense, and without that sinking feeling that this is going to take some serious work. Also, we undoubtedly have all experienced these sentiments during the progression of our lives as students, those times when we were faced with hard labor as readers.

I can vividly recall such a personal instance, one of my true epiphanies as a learner. As a high school junior, I found myself needing to upgrade my performance in my chemistry class. As mentioned in previous chapters, even in high school, I had an identity as a history-type person, and although I expected to do well in all of my classes, I did not necessarily look forward to studying science with the same eagerness that I displayed when learning social studies or even exploring literature. To some extent, I did not feel as confident in science contexts; I realized that I did not bring as much incidental background knowledge to support my science learning as I had in history. I was a nonscience person who was trying to operate successfully in science contexts. After the first couple of unit exams, it was clear to me that I had a solid but not comprehensive understanding of the topics that we were studying in chemistry. I could generally follow class conversations and at times contribute, but I was not the person to talk to if you needed an in-depth explanation. In other words, I was getting by with a B.

Almost daily, we were assigned sections to read in the chemistry textbook. The content of these sections provided the focus for class discussions and activities, but the teacher was not in the habit of repeating for us what we should have garnered through our reading. Instead, we were expected to display *our* understanding rather than listen to the teacher explain *his* understanding. He approached the topics of chemistry through a more Socratic line of questioning, preferring to ask us rather than tell us. I had been doing what I had always been doing with science reading: understanding only at the level necessary to complete the assigned questions. I was relying on surface reading to locate answers. It became increasingly evident to me that this reading behavior would not suffice if I was to obtain a deeper understanding of the topics of chemistry. I was going to have to undertake the necessary effort and work the chemistry text, and work it I did.

I started by resolving that nothing will go by without making perfect sense. I read carefully, with full attention and determination. I stopped

frequently, almost after each paragraph, and summarized to myself what I had understood. I reread. I thoroughly examined visual information and related it back to the written prose. I found myself mumbling over and over again, “So this means....” I jotted down notes (this was before the advent of sticky notes; otherwise, my book would have been fluttering with colorful pennants of distilled knowledge and observation). I paged back to previous sections and revisited past concepts, connecting them to the current topics. At the end of each reading session, I explained. I explained as if I were an expert, as if I were a science guy, as if I knew what I was talking about. I talked to myself, talking the talk of chemistry.

I then walked into chemistry class with more of an attitude. I was determined to showcase my work, demonstrate that I had gotten the stuff, fully participate in the classroom dialogue, and exhibit my mastery of the discourse of chemistry. I discovered that I could respond to the class inquiries with assurance, perceive the implications of my new knowledge for class activities, and project my thinking through a scientific lens. Yet, what really struck me was my self-awareness of identity change; I had started to see myself as a science person, as a person in the know. I would not argue that I was the most stellar science student in the course, but I did become one of the individuals that others came to with questions to seek clarification. Here I was, a history guy, masquerading as a science insider, and I was now getting my A.

REFLECTION INTERLUDE

Think back to situations when you had to work a text. Try to recall a school context, like my chemistry example, when you were compelled to dig in and work a text to obtain a satisfactory understanding. You might even consider your experiences as a college student. What was the discipline? What was the nature of the text? What actions did you take to successfully work the text?

I have called this an epiphany because I had arrived at the empowering realization that I could truly understand material that may be outside my realm of preference and comfort by working it. It was surprising to me to discover that the more knowledgeable I became, the more I actually

enjoyed learning chemistry. My identity shift was a significant variable in this reconceptualization of myself as a learner; I was no longer limiting my definition of who I was and what I was capable of doing. I was consciously reevaluating my possibilities of moving from outsider status to more of a chemistry insider. My willingness to embrace examining my life and world through a different disciplinary lens provided a huge impetus for working a text that did not come easily. As I realized, competence is a powerful motivator!

Perhaps many of you are thinking at this point, Nice story, but few of the students in our classrooms exhibit the kind of motivation you displayed with working your chemistry text. As research discussed in previous chapters suggests, in many of today’s classrooms, students would not have to. They would not have to develop the capacity to read complex texts independently, as I did with my chemistry text, because they could count on the teacher telling them what they need to know. Because I am an excellent listener, and working the chemistry text was a tedious enterprise that took concerted time and effort, I am sure that I too would have preferred to have had the needed knowledge of chemistry handed to me if that had been an option. However, I was not given that option, and I am a more accomplished reader and thinker because of it. Of course, I am not advocating assigning reading without frontloading instruction—a sink-or-swim dynamic and my experience, which meant that I was constantly sent into the textbook cold and without preparatory work. Yet, I am certain that I would not have learned chemistry, or other sciences taken subsequently in college, with the depth of understanding that I was able to achieve if I had not engaged in the deep processing necessary to successfully work these texts.

A Reformulation of Study Skills

The strategies that I employed to work my chemistry text are traditionally lumped together under the umbrella of study skills; for example, I displayed mature study skills during my reading of the chemistry text. I showed motivation, managed my time well, and found a quiet, distraction-free spot in our farmhouse to give full attention to my exertions. I turned the radio off (these were pre-iPod days). I recited, I paraphrased, and I summarized. I used note-taking and would have

marked the text, underlining or highlighting, if that had been permitted; I certainly used text marking and annotating a lot as a college student, when I was compelled to purchase the texts that I studied. Implicit in my actions were the use of text features provided by the author, especially visual information, to guide my thinking. In college, I sometimes took my verbalizations a step further, going public by linking up with other students in study groups, so we could practice our explanations, rehearse our understandings, and more deeply engage with the material. All of these actions are predicated on commitment, a commitment to do what is necessary when I have to work a complex text.

Identity and Habits of Mind

All of these actions are predicated on identity. Who is the kind of person who would use such study routines to work a text, and how do we as teachers nurture such disciplinary identities? This gets us into that nebulous territory that is encapsulated in the term *study skills*. The term *skill* is in and of itself diverting. For example, my wife Wendy is a skilled violinist. She got that way via certain attitudes and behaviors that she brought to practice routines as she worked her music. I do not know that we would term her practice routines as skills, however. We would more likely say she has excellent practice habits that have contributed to her development of skill on her instrument. Since her high school years, Wendy has sought an identity as a violinist, which has motivated her to adopt highly effective work routines that have enhanced her skill as a musician. When she practices, she demonstrates dedication, determination, perseverance, goal setting, attention to detail, adherence to proper technique, patience for incrementally gained mastery, and of course, frustration management—none of which we would necessarily term skills, but all are means to developing skill. These might be called habits of mind, a term I vastly prefer over study skills.

Goleman (1995) has introduced the term *emotional intelligence* to describe traits that are integral to these habits of mind. In his review of a wide range of research, he isolates a number of personality variables that affect performance, including the following:

- Resisting impulsivity
- Managing stress and frustration

- Handling failure
- Showing persistence
- Maintaining a positive outlook
- Collaborating effectively
- Delaying gratification

Linked to these traits is displaying an internal drive, an inclination to motivate oneself to meet valued personal goals. Goleman's (1995) central argument is that emotional intelligence factors are critical to achievement, perhaps more necessary than just talent alone, and that these are all traits that can be fostered by teachers in our students. It is easy to see how intricately such characteristics are woven into the kind of persona that can be successful in negotiating the rigor associated with disciplinary learning. We rarely pass a day with students without considering how motivation intersects with disciplinary learning.

Personal Systems

Teachers often refer to lack of study skills as a significant hindrance to student reading and learning in their disciplines. The conversation among teachers frequently veers into "Someone needs to teach these students study skills," or more rarely, "We need to teach our students study skills." When teachers mention study skills, they are generally speaking of student work routines and, in this case, the work that one must do to comprehend complex texts. Some of what we call study skills are personal systems that we employ to work at peak efficiency and effectiveness, and others are learning strategies that we use to successfully do the work of a specific task. For example, when we say students are disorganized, we are referring to personal systems for doing the general work of a student. Likewise, when we talk about students needing to schedule their time effectively, create a work environment at home that is conducive to studying, and manage competing demands to ensure that school tasks are completed properly, we are identifying personal systems. When we talk about actions like note-taking, text marking or annotating, previewing a chapter, reciting, or creating graphic representations like charts and concept maps, we are now referring to learning strategies that are appropriate for understanding and remembering.

When I think about personal systems for undertaking a task, I am immediately reminded of my father-in-law, who worked for 40 years as a mechanical expert and repair technician for the local Oscar Mayer food-processing plant. His life was maintaining and repairing the complicated and intricate machinery that kept the plant humming, and his personal systems for his work spilled over into other facets of his life, especially in home improvement projects. When we worked together, he insisted on clearing the area first and then unpacking and organizing his tools, each item allocated and returned to its place after each use. He always knew immediately where everything he needed was, and he proceeded to work methodically and carefully, never in a hurry and always rehearsing the steps that he would follow for a specific task. If my more sloppy routines, especially with handling tools, were not what he expected, then he kindly suggested that I should adhere to his methodology. I would stand by, sometimes impatiently, while he muttered aloud his problem solving and puttered about meticulously lining up materials and identifying necessary tools. My father-in-law had a very successful system for doing the work the "right" way; it was integral to his identity as a tradesman.

My family would tell you that although I had plenty of modeling and practice with my father-in-law's very precise and systematic routines, I have not really adopted them personally when I am engrossed in my own home improvement projects. I tend to jump into the work, fetch my tools as I need them, occasionally misplace them, waste time with searching for where I left an item, and generally operate in the midst of chaos. I am not careless, but I am not as efficient as I could be. My routines work well enough for me for my infrequent projects, and I tolerate work conditions that my father-in-law would never permit. Again, it is a matter of identity.

REFLECTION INTERLUDE

I have referred to my wife's personal system for practicing her violin and my father-in-law's personal system for projects that involve the use of tools. Who do you know who has a clearly articulated personal system for accomplishing tasks of a certain nature, perhaps yourself? Take a few moments and describe the elements and routines of this person's system. How does the personal system facilitate doing the targeted tasks efficiently and well?

Learning Strategies

Certainly, teachers have cause for concern with their students' personal study systems, from overstuffed backpacks and cluttered lockers to dilatory and dallying behaviors that result in rushed or shoddy efforts, late assignments, or uncompleted work. However, this chapter focuses on the second facet traditionally connected to study skills: learning strategies.

Several issues surface during a consideration of strategy use with complex texts:

- Teachers should neither assume that their students know how to effectively work a text nor that they have had the sufficient guided practice so that such strategies become internalized routines.
- Teachers should not regard study skills as generic practices but rather as disciplinary-specific strategies that will vary in form and application, depending on the nature of the text and the demands of the discipline. (Formulaic approaches, such as two-column note-taking, may overlook different challenges and needs with various disciplinary texts.)
- Teachers should not assume that students will choose to use particular learning strategies on their own, even if they have been introduced to them, or that students would be willing to work a text with the intensity that many of these strategies mandate.

This last issue, of course, directly involves developing student identities as readers, writers, and thinkers through specific disciplinary lenses.

In their research synthesis on cognitive strategy instruction, Dole and colleagues (2009) note the key role of motivation:

Students must be persuaded to see that the goals of the strategies have personal relevance and meaning for them, that the various strategies have value and utility for them, and that self-managing their time and effort in using the strategies will aid them in achieving their reading goals. (p. 350)

Notice that this quotation centers on the word *persuaded*; mentoring students means we make a compelling case for the work rather than merely expect it to be done.

Researchers posit that students need to know the what, the how, and the when and why of using learning strategies to work complex texts (Paris, Lipson, & Wixson, 1983):

- *What* is declarative knowledge. Readers develop what Wilhelm and his colleagues (2001) have termed moves, which are actions to help readers understand and remember.
- *How* is procedural knowledge. Readers have experienced the necessary guided practice so that they are comfortable with the thinking involved in applying a learning strategy.
- *When and why* are conditional knowledge. Readers can scope out the conditions of a task and decide on the most appropriate actions to satisfy their challenges as a reader.

It is this conditional knowledge that can be the missing link in disciplinary learning, but conditional knowledge cannot be neglected if students are to become intentional agents of strategy use. As argued in previous chapters, the conditions are very context dependent and can vary dramatically from one disciplinary setting to the next. In other words, if students do not receive disciplinary-specific instruction in learning strategies, then they might become competent in applying learning strategies in some disciplines and not in others.

A common theme in the research on learning strategies is the lack of transfer; students learn strategies in one setting but do not transfer this knowledge to other settings (e.g., Conley, 2009; Dole et al., 2009). Often, learning strategies are introduced, and students receive practice applying them in decontextualized settings, such as a study skills unit or course. For a number of years, I taught an elective course for ninth-grade students that targeted the development of effective learning routines. It was not difficult to teach the declarative (*what*) and procedural (*how*) facets of learning strategies. Students could demonstrate effective strategy use with complex texts in my classroom, but the key variable was their comfort in transferring these actions to the study of other disciplines. Even though I modeled strategy use with the texts of their other disciplines, many students still had trouble making the jump to the when and why of conditional knowledge in those classes.

The most significant absent dimension was the context-specific modeling by their disciplinary teachers that reinforced strategy use in

the service of understanding those disciplines, and the regular, ongoing guided practice within those disciplinary contexts. What I was proposing to my students was frankly more work than they were used to doing, especially when compared with skimming for answers. Students need to see that learning strategies are critical to unlocking learning in their disciplinary subjects and that expending such effort will be worthwhile. Students' motivation to do so hinges on fostering them to adopt identities that include interacting with the world through different disciplinary lenses.

Developing Reader Moves

Sports fans relish regaling each other with the fabled moves of their favorite players: the moves of hockey legend Wayne Gretzky as he swooped toward the net, the moves of tennis superstar Serena Williams as she shut down another opponent, the moves of silk-smooth NBA forward Kevin Durant as he outflanked a defender to slam home two more, and the moves of wily veteran NFL quarterback Peyton Manning as he marched through the defense for another touchdown. Children imitate the moves of admired athletes, and arguments abound as to whose "game" displays the best moves. (Will there ever be another baseball shortstop who can match the moves of the incomparable Wizard of Oz, Hall of Famer Ozzie Smith?)

As previously stated, Wilhelm and his colleagues (2001) coined the term *moves* to refer to the actions we take as readers when we engage with a text. The analogy to the effective moves developed by highly skilled athletes is a powerful one: Proficient readers have also established a repertoire of successful moves that enable them to handle a wide range of texts for a variety of useful purposes. Both accomplished athletes and proficient readers make moves that represent actions that are intentional, are undertaken to achieve success in one's efforts, are fine-tuned through considerable practice, are adaptable to varying situations or circumstances, can become a matter of habit, and can be personalized so that different individuals have their own preferred moves. Helping students identify the reader moves that enable them to work complex texts is a significant step in their development as independent readers and learners in disciplinary contexts.

Cognitive Strategies

Some reader moves can be described as orchestrated ways of thinking as a reader, identified in Chapter 2 as comprehension processes. These moves represent self-directing and planful thinking that becomes a habit of mind for accomplished readers. Some of these comprehension moves for readers are the following:

- I try to think about things I already know that are connected to what I am reading.
- I try to picture in my head what an author is saying.
- I raise questions to myself while I am reading.
- I try to decide what a person should know about what the author tells me.
- I look for implications of things that are not directly stated.
- I try to sum up what an author is saying in my own words.

These moves are sometimes referred to as cognitive strategies. Chapter 5 is dedicated exclusively to questioning moves that readers can make in different disciplinary contexts.

Metacognitive Strategies

Some reader moves can be categorized as metacognitive strategies. When readers are conscious of tracking their own thinking, they are behaving metacognitively. I would describe this dynamic to my students

“

A good reader, then, should be one who questions what is read, re-reads confusing passages, and evaluates his or her understanding of what the author is trying to communicate.

”

—Baker & Beall, 2009, p. 380

with the analogy that proficient readers behave as if they have a split personality, that there are of two of them engaged in the reading process. One personality does the direct work of comprehension: interacting with an author and the text. The other watches intently, monitoring to make sure everything is proceeding satisfactorily.

The metacognitive voice is the one that periodically interjects, “Hold on there! This isn’t making any sense.” The metacognitive voice

sometimes evaluates: “I know I didn’t totally get that, but I probably understood well enough to meet my goals,” or “Unacceptable! We’re

going to have to try something else here.” The metacognitive voice is also analytical: “Hmm, tough vocabulary here, that’s what’s throwing me off,” “Yeeks, I must have misread that previous part because this isn’t what I was expecting,” or “Pretty familiar stuff here, I’ll just accelerate my rate to check for anything that might be new.” Finally, the metacognitive voice is controlling: “OK, if this reading is going to end up making any sense, then there are some adjustments that we are going to need to make here.” My students have shared that the metacognitive personality sounds a lot like a bossy backseat driver who really needs to be obeyed whether the driver likes it or not. The Comprehension Checkdown questions in Chapter 4 (see page 159) are an example of strategies to inculcate this metacognitive processing.

It is this metacognitive presence that needs to be awakened, or even ignited, for many of our students. For them, if there are any directives coming from the back seat, then they are in the teacher’s voice not theirs. Otherwise, students drive merrily, or perhaps begrudgingly, along through the dense fog of a text, regardless of smashups in comprehension. You cannot work a text without this metacognitive self-guidance, and teacher modeling as well as classroom tasks around complex texts need to make explicit these metacognitive strategies. In Chapter 2, the comprehension process of monitoring one’s reading and applying fix-up strategies sets into motion making metacognitive moves as a reader. Regular class debriefing sessions about *how* students are thinking are just as important as the discussions about *what* they are thinking. Schoenbach and colleagues (1999) call these debriefing sessions metacognitive conversations, periodic sharing and evaluating of the thinking and the strategies that students use as they work their comprehension.

Strategic Actions

This leads us to a third category of reader moves: strategic actions. Ultimately, these are actions that are initiated and directed by the reader to support comprehension and lay the groundwork for learning. Strategic actions contrast with the default reading behaviors often assumed by students: a sole focus on the completion of teacher-initiated tasks, such as filling out a worksheet or answering a set of questions. Strategic actions become internalized ways of responding to the demands of working a text. In their research review on learning strategies, Weinstein and Mayer (1986)

subdivide these strategic reader actions into rehearsing, elaborating, and organizing moves. Each of these moves are examined in some detail in this chapter, with disciplinary-specific examples on instructional practices that mentor students in using these strategic actions.

Instructional Practices for Rehearsing

A rehearsing strategy emphasizes the comprehension process of determining importance. For example, highlighting and underlining are both moves that lift out portions of an author's message that are deemed by a reader to warrant some return time. Text annotating, such as inserting an asterisk next to places in the text that are judged important, is also a rehearsing strategy because it designates where in the text the reader needs to return for further deliberation. Jotting down verbatim notes and tagging spots in a text with sticky notes are further examples of rehearsing, both of which involve identifying segments of the author's message that will receive more work. Pausing periodically for reciting is a classic rehearsal strategy, a quick, on-the-spot return to verbalize some parts of a message. If you would pull out any of my old college texts, as well as most of the current professional books and articles that I have read, you would find ample evidence of me using nearly all of these rehearsal strategies.

Of course, as teachers, we can hardly take rehearsing moves for granted. When we engage in rehearsing as a reader, we are exhibiting a personal commitment to strive toward satisfactory comprehension and to use our reading to broaden and deepen our understanding. Rehearsing is in direct contrast to the drive-by reading preferred by many of our students, who hurry through a text merely to complete a task. Instead, when readers work a text, they pull over frequently for a more intense look, ponder what they are seeing, and come back repeatedly to view the highlights.

Students need a great deal of practice with rehearsing moves. Determining importance is a comprehension process that is particularly challenging. As mentioned a number of times in this book, students generally prefer tasks that allow them to quickly locate something that can be written down to satisfy an assignment demand. In contrast, rehearsing moves require judgment and decision making; readers must determine what is background information and what is essential for understanding. Rehearsing moves involve identifying those text elements that qualify for

further study and learning. Otherwise, many disciplinary texts loom as overwhelming mazes of dense information and details.

Text Marking

Highlighting, underlining, and marginal annotating are the most efficient rehearsing moves, and when texts can be marked, these strategic actions should be integrated into any task assigned to accompany reading. However, much modeling and explicit instruction of the thinking behind determining importance need to be provided before eager students commence wielding their uncapped highlighters. Otherwise, "yellow marker syndrome" is likely to ensue, with overmarking, random marking, or outright coloring a probable result. During modeling, students need to tune into the teacher's thinking as these strategic marking choices are made, they need to see well-marked passages numerous times, and they need guided practice and frequent feedback on the intellectual work involved with determining importance. Sticky notes are certainly a workable option for achieving this purpose with any text, but they are a necessity with texts that cannot be marked.

For example, what would you target as important for marking in a work of literary fiction? Certainly, a number of highlighting or underlining choices could be made by a reader, but providing guidance to students as to what to be alert for can make marking a highly useful move. Edgar Allan Poe, that macabre presence in many literature anthologies, offers an outstanding opportunity for students to explore how the use of language establishes tone or mood of a passage. Two key evaluating questions in the Self-Questioning Taxonomy for Literary Fiction (see Table 5.3) are "What does the author's choice of words indicate about what the author might be thinking?" and "What emotions is the author eliciting?" The opening paragraph of Poe's (1839/1984) *The Fall of the House of Usher* provides an excellent practice text for marking emotional content in a literary work. In this case, students were instructed to mark all words and phrases that show emotion or stimulate an emotional response from a reader:

During the whole of a dull, dark, and soundless day in the autumn of the year, when the clouds hung oppressively low in the heavens, I had been

Providing students with even a limited amount of instruction in how to underline important main ideas and the need to review those ideas is important for enhanced performance.

—Caverly, Orlando, & Mullen, 2000, p. 113

passing alone, on horseback, through a singularly dreary tract of country; and at length found myself, as the shades of the evening drew on, within view of the melancholy House of Usher. I know not how it was—but, with the first glimpse of the building, a sense of insufferable gloom pervaded my spirit. I say insufferable; for the feeling was unrelieved by any of that half-pleasurable, because poetic, sentiment, with which the mind usually receives even the sternest natural images of the desolate or terrible. I looked upon the scene before me—upon the mere house, and the simple landscape features of the domain—upon the bleak walls—upon the vacant eye-like windows—upon a few rank sedges—and upon a few white trunks of decayed trees—with an utter depression of soul which I can compare to no earthly sensation more properly than to the after-dream of the reveller upon opium—the bitter lapse into everyday life—the hideous dropping off of the veil. There was an iciness, a sinking, a sickening of the heart—an unredeemed dreariness of thought which no goading of the imagination could torture into aught of the sublime. (p. 317, all underlining added)

Enough already! Poe goes on in this vein, but toss in some other opening details of the setting (e.g., autumn, when things begin to die; the isolated location, which could lead to feelings of vulnerability; the onset of evening, which foreshadows the coming darkness), and you have identified plenty of the spooky, menacing tone for what would surely be a Poe-like story to follow. In this instance, students were provided with explicit guidance in Text Marking, and as they inventoried the text elements that they identified as having emotional content, the students were prepared to talk about the mood created by Poe's choice of words and begin considering what this author might be up to here.

REFLECTION INTERLUDE

What could be a complex text from your discipline with which you could demonstrate appropriate text marking? Consider a short text, or a segment of a longer disciplinary text, for which you would like students to use text marking or highlighting as a rehearsing move. What would warrant attention as of key importance? How could you model your thinking as you decided what was deserving of marking versus what was merely secondary information or details?

Note-Taking

Note-Taking, the most laborious rehearsing strategy, may be the best strategic move with some texts, especially those that cannot be marked. Note-Taking is predicated on culling out key material that can be reviewed at a later time for learning and further application. Verbatim notes, the copying of identified key material, need to be thoughtfully and purposefully taken; obviously, Note-Taking needs to transcend the act of merely writing stuff down. The form that notes might take can be quite idiosyncratic, but regardless of format, notes function as personal reminders of elements of a text deemed important.

Online texts present special issues with rehearsing strategies, although at times, some texts can be printed and marked, which is my preference when that is an option, but it is often unworkable in a classroom setting. Students will need plenty of mentoring, with practice and feedback, in Note-Taking procedures for online texts.

Of course, rehearsing strategies ultimately must result in using the strategies' moves—Text Marking, highlighting, and Note-Taking—as a basis for rehearsing understanding. Karpicke and Blunt (2011) demonstrate the high level of effectiveness of intentional retrieval moves: reciting through free-recall note-taking (i.e., not looking at the text while listing what is important), repeated over multiple sessions. Deciding what deserves attention and then intending to remember it must go hand in hand.

“
Retrieval is not merely a read out of the knowledge stored in one’s mind; the act of reconstructing knowledge itself enhances learning.
”

—Karpicke & Blunt, 2011,
p. 774

Instructional Practices for Elaborating

Elaborating moves involve more in-depth processing of a text. The Self-Questioning Taxonomies presented in Chapter 5 are all examples of elaborating strategies; the reader begins to interact with an author, clarify understanding, and personalize a message. Questioning the Author (see page 175) is the epitome of a research-based elaborating move. In effect, all of the comprehension processes detailed in Chapter 2—making connections to prior knowledge, generating questions, creating mental images, making inferences, determining importance, and synthesizing—depend on elaborating moves by the reader.

Figure 6.1 presents an example from the health curriculum, as students are prompted to use the six levels of questioning discussed in Chapter 5 to elaborate on their understandings of an article that alerts readers to the dangers of hearing loss from MP3 players. Students use the Self-Questioning Taxonomy (see page 181) to walk their

Figure 6.1. Self-Questioning Response Chart on Hearing Damage

Level of Thinking	Comprehension Self-Assessment	Focusing Question	Sample Response
Creating	I have created new knowledge.	How has this author changed what I understand?	"Listening to my MP3 player too loud may not affect my hearing right away. I need to use the three-foot rule to protect my ears."
Evaluating	I can critically examine this author's message.	What perspective or authority does the author bring to what he or she tells me?	"An expert on hearing is likely to know what he's talking about, so I believe that listening to music too loud can hurt my hearing."
Analyzing	I can explore deeper relationships of the author's message.	How is this similar to (or different from) other texts that I have read?	"I've heard and read that the level of noise at rock concerts can cause temporary hearing loss."
Applying	I can use my understanding in a meaningful way.	How can I connect what this author is telling me to understand something better?	"I remember how my ears rang the day after I attended a rock concert last summer."
Understanding	I can understand what the author is telling me.	What does this author want me to understand?	"Listening to MP3 players on high volume with earbuds can contribute to hearing loss as much as rock concerts can."
Remembering	I can recall specific details, information, and ideas from this text.	What do I need to remember to make sense of this text?	"Exposure to loud noises can cause hearing loss."

Note. Courtesy of Jennifer Breezee, DeForest Area High School, DeForest, WI.

personal thinking through the article and express their understandings at each level of the taxonomy. In effect, the elaborating move is for students to question themselves as they consider what the author is telling them.

Text Coding

Text Coding is a powerful means for elaborating and also for talking back to an author and joining in the conversation. Figure 6.2 presents several widely used text codes that can be penciled into margins or onto sticky notes. Notice how each code signals the deeper processing that is involved with elaborating. The codes are entered with a brief notation—a question, a personal observation, or a comment—as the reader tracks a particular line of thinking while driving toward comprehension of a text. (For a more in-depth discussion of Text Coding, see Buehl, 2009a.)

Figure 6.2. Common Text Codes

Code	Mental Frame	Significance
R	"This reminds me of..."	A connection to background knowledge, experiences, or prior learning
V	"I can picture this..."	Creating mental images and sensory responses
E	"This makes me feel..."	An emotional response to the text
A	"The author feels..."	An attitude or view of the author
Q	"I wonder..."	A question triggered by the reading
I	"I figured out that..."	Making an inference, such as a prediction or an interpretation
*	"This is important..."	A need-to-know idea or information that needs to be remembered and revisited
!	"This is interesting..."	Something especially interesting or attention grabbing
?	"I don't understand this..."	A segment that is confusing and needs clarification
+	"I agree with this..."	A statement that elicits reader agreement
-	"I disagree with this..."	A statement that elicits reader disagreement

Note. Adapted from *Classroom Strategies for Interactive Learning* (3rd ed., p. 180), by D. Buehl, 2009, Newark, DE: International Reading Association. Copyright 2009 by International Reading Association.

Teacher think-alouds that model coding a text are a necessary instructional step, and students need practice using these codes as they work their understanding of disciplinary texts. Focusing on a particular comprehension process at one time is helpful to inculcate this thinking. For example, asking students to mark an asterisk next to three places in the text where the author talks about things that a person needs to know targets determining importance. Conversations then follow that engage students in sharing their thinking about why their choices deserve need-to-know status.

Figure 6.3 offers a disciplinary-specific variation of Text Coding, tailored for science reading. In this case, a chemistry teacher focused on questioning moves that students should make when working the chemistry textbook. Students were assigned a range of questioning codes to use, with the expectation that all of the framed questions were likely to surface in students' thinking during their reading. Obviously, the teacher was also prompting this thinking for students and raising awareness of using questioning moves to achieve comprehension. Following the reading, students turn to their think marking as discussion starters as they meet in groups, share their questions, and use one another to try to resolve as many of their questions as they can. Each group of students then reports

Figure 6.3. Chemistry Think Marks

Code	Purpose	Mental Frame	Significance
C	<u>Clarifying</u>	"What is the author saying here about...?"	A segment that is confusing and needs clarification
V	<u>Explaining vocabulary</u>	"What is the meaning of...?"	A chemistry term that is unclear
P	<u>Predicting</u>	"What does the author mean...?" or "Does this happen because...?"	Implications of the information being considered
T	<u>Tying ideas together</u>	"Is this related to...?" or "What did we learn before that relates to this?"	Connecting this section of the text with something learned earlier in the year
Q	<u>Questioning</u>	"I wonder if...?" or "I wonder whether...?"	Wondering how this material connects to some aspect of one's life and world

Note. Adapted with permission from a strategy by Katie Johnson, Madison, East High School, Madison, WI.

on their understandings and may ask for assistance from the rest of the class regarding unresolved questions and still problematic text sections.

Paraphrasing and Note-Taking

Paraphrasing actions are primary elaborating moves: stopping to paraphrase what an author has said, jotting comments in the margin or on sticky notes, or paraphrased note-taking, as opposed to merely writing down exactly what the author said, which are verbatim notes. Two-Column Notes, a widely popular note-taking system, is predicated on elaborating; the right column is reserved for the notes, either paraphrased or verbatim, and the left side is for elaborating (e.g., developing questions, generating key themes, summarizing). Figure 6.4 presents a two-column notes example taken from a psychology text; the left column represents questioning as an elaborating move, and the box at the bottom displays the culminating elaborating move of summarizing.

Two-Column Notes is sometimes adopted as a schoolwide literacy practice, as many teachers are concerned with student note-taking, or lack thereof, but note-taking initiatives often seem typically applied to capturing teacher talk, the verbal information from class presentations and lectures, rather than as an elaborating strategy for reading comprehension. Again, modeling, ongoing guided practice, and feedback are key variables in developing note-taking as an elaborating move.

Double-Entry Diaries are a variation of Two-Column Notes that are especially designed for elaborating moves. Students draw a line down the center of a sheet of paper and use the left side for recording textual ideas and information and the right side for elaborating. A teacher may solicit a range of elaborating moves for the right side: paraphrasing, questioning, connecting to prior learning, personal experiences and reflections, verbalizing why something the author says is important, and so forth. Harvey and Goudvis's (2007) and Tovani's (2000) books are excellent resources for a myriad of examples of using this instructional practice. Double-Entry Diaries are especially useful as a strategy for prompting elaborating moves when reading literary fiction. Figure 6.5 is an example of using a double-entry diary as an elaborating move in a literature class. Students jot down passages from the text that are particularly meaningful to them, and elaborate on the right side about how things the author said intersect with their lives.

Figure 6.4. Two-Column Notes on a Psychology Text About the Development of Habits

<p>What Habits Are</p> <p>1. Habits → patterns of thinking, acting, + feeling Are repeated until are automatic 90% of our behavior habitual</p> <p>Why Humans Need Habits</p> <p>2. Habits are Survival Techniques Can do one thing when think of another (ex. talk while drive car) Helps humans adapt to change Calms body → reduces stress when can act automatically</p> <p>How Habits Start</p> <p>3. 1st Habits → developed as a child Eating to feel good, not just for hunger</p> <p>Why Practice is important in School + Sports</p> <p>4. School Habits → from practice (Ex. Multiplication Tables from memory) Athletics - practice wrong, develop bad habits - also music instrument Not enough practice - not learned so can't be automatic</p> <p>Why Habits are Hard to Break</p> <p>5. Break Habits → Hard to do Need to unlearn, brain cells already programmed Unlearning can be harder than new learning Fears are habits (ex. of snakes) Negative Habits hard to overcome (ex. overeating, smoking, biting nails)</p> <p>Habits are necessary for human survival because we need to do multiple things at once, without thinking about them. But getting rid of bad habits is hard because they are learned behaviors</p>
--

Figure 6.5. A Student's Double-Entry Diary Page on Personal Connections to a Text

The book	My Connection
1) page 5 - "Don't humiliate us. You wouldn't like to be forgotten as if you had never been born. The villagers are watchful."	People of my nationality like to gossip a lot. Our parents are concerned about our family reputations, so they say things like this to make sure we behave.
2) page 11 - "Once my aunt found a freckle on her chin, at the spot that the almanac said predestined her for unhappiness. She dug it out with a hot needle and washed the wound with peroxide"	Hmong women do not think that birthmarks are attractive. My mother would heat a needle and remove our birthmarks when we were little girls.
3) p. 15 - "My Chinese brothers and sisters had died of an unknown sickness."	Both of my parents lost brothers and sisters from diseases in our home country.
4) p. 23 - "When we Chinese girls listened to the adults talking story, we learned that we failed if we grew up to be wives or slaves."	My parents believe very strongly in education and they want us to study and better ourselves. If we married before we finished school, we would not reach this dream, and we would be a disgrace to the family.

Note. Adapted with permission courtesy of Andrew McCuaig, La Follette High School, Madison, WI. Excerpts from Kingston, M.H. (1975). *The woman warrior: Memoirs of a girlhood among ghosts*. Vintage.

Summarizing

Summarizing strategies are essential elaborating moves and may take the form of summarizing orally to oneself (i.e., a more sophisticated variation of reciting) or actually condensing information into summary note-taking sheets that capture key material. Summarizing is challenging thinking for students because they must both determine importance and synthesize understanding. Table 6.1 compares three variations of reader interaction with a written text: retelling, paraphrasing, and summarizing. Summing up what an author says is not only paraphrasing but also engages a reader in establishing the gist of a message, the essence of what the author wants readers to take away from the text. Instructional practices that provide practice for students to verbalize their understandings, both orally with partners as well as in writing, are vital and need to occur on a regular basis during disciplinary learning. As Table 6.1 indicates, however, not all verbalizing actions represent summarizing.

Writing is obviously a more intense form of summarizing than are oral summations. Quick writes can be employed frequently to seed the process of regularly summing up understandings. Notice how Quick Write prompts from Chapter 4 (see page 124) also facilitate summarizing understandings. “One thing I understand now is...” and “A brief summary of...should include...because...” are examples of Quick Write stems that facilitate summarizing.

Table 6.1. Comparing Elaborating Moves

Retelling	Paraphrasing	Summarizing
Repeating what the author said	Restating what the author said	Condensing what the author said
Using the author’s language	Using language different from the author’s	Using key language from the author to develop a personal summary
Including secondary information	Possibly including secondary information	Focusing on need-to-know elements and eliminating secondary information
Rehearsing (“The author said...”)	Personalizing the message (“How I would say it?”)	Summing up the message (“Basically, the author said...”)

In addition, providing students with some of the key language about a topic and asking them to create a summary of a few sentences built around this language is an effective way to support development of summarizing as an elaborating move. For example, the following is a prompt for summarizing understanding in an art classroom: “Write a three-sentence summary that explains your understanding of *Impressionism*. Use each of these terms in a meaningful way as you express your understanding: *light, brushstroke, France, outdoors, nature, perception, subjective, colors, and Monet*.” This summarizing activity cues students toward key concepts and terms that should be folded into a comprehensive summary, and points them toward the central ideas of this concept. In addition, students receive practice personally putting the discourse of art into play in verbalizing their understandings.

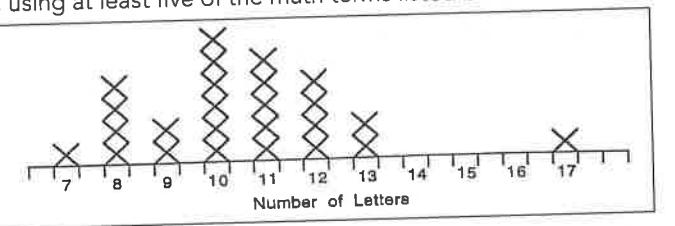
A second variation of vocabulary prompting was used in a history context and provided a conceptual framework for the summarizing of key ideas. My son Jeremy and his colleagues constructed triplets for student summaries, each clustered around one of five central themes of U.S. history: opportunity, rights, equality, democracy, and liberty. For example, students studying the post–Civil War period might be provided with the instructions “What was the impact on opportunity? In a paragraph, identify and explain how each of these increased or decreased opportunity: the 15th Amendment, the Freedmen’s Bureau, and sharecropping.” This format provided students with a structure for formulating coherent summaries that connected factual information to general historical themes. Rather than asking for responses to isolated facts, this summarizing practice emphasized articulating cause–effect relationships, consistent with thinking through a historical lens, and using facts to explain understandings.

Figure 6.6 presents a more sophisticated version of a disciplinary-specific, scaffolded summarizing task. Students are provided with a menu of mathematics terminology and have to choose the most appropriate language to use to express their understandings. This version transitions students into becoming users of mathematics discourse by adding in the decision making of which insider mathematics terminology would be the best fit for summarizing in this instance.

Story Impressions, described in Chapter 4 (see page 144) is another instructional practice that scaffolds the critical process of summarizing text as an elaborating move. Figure 6.7 presents a Story Impressions template

Figure 6.6. Vocabulary Prompts for Summarizing "Data About Us"

Study the data display below. In a paragraph, explain your understanding of what the data tell you, using at least five of the math terms listed below.

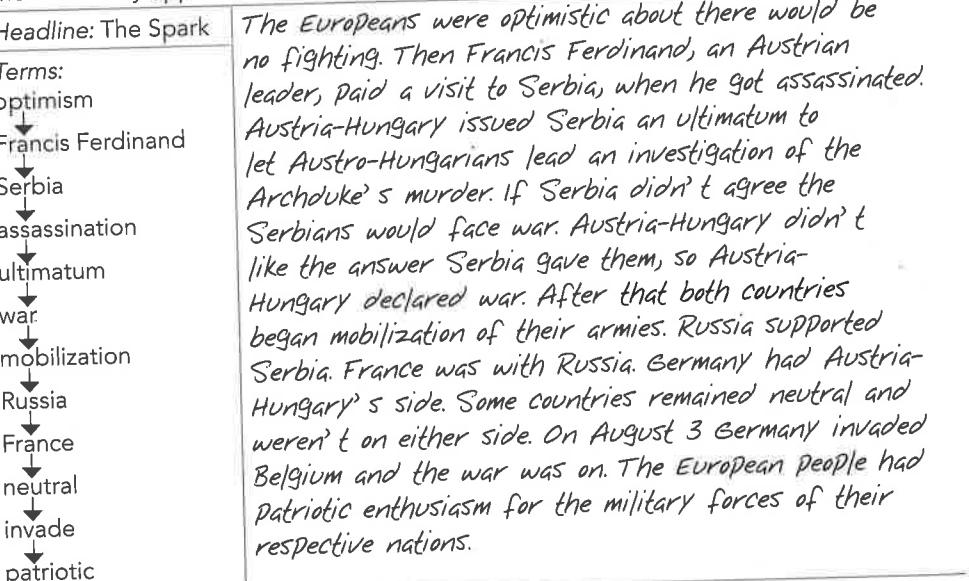


average	interval	numerical
axis	line plot	outlier
bar graph	mean	peak
categorical	measures of center	range
cluster	measures of spread and shape	scale
data	median	stem and leaf
frequency	mode	typical
gap	number line	value
horizontal		vertical

Note. Courtesy of Jim Leidel, Toki Middle School, Madison, WI.

Figure 6.7. Story Impressions Summary on World War I

Cause and effect: Summarize how World War I began. Use all of the terms listed below in the order they appear. Your summary should be at least 10 sentences in length.



Note. Adapted with permission courtesy of Jessica Hutchison, Lac Courte Oreilles Ojibwe School, Hayward, WI.

for world history, which asks students to summarize the cause-and-effect sequence of events that led to World War I. Story Impressions can also be integrated into essay assignments and exams as an excellent scaffold for verbalizing understandings through written assessments.

Instructional Practices for Organizing

Organizing moves expand on elaborating by reformulating an author's message in some coherent way. Implicit in organizing strategies is perceiving the structure of a message and using that structure to determine what is most important and to identify relationships between details, facts, and ideas. The comprehension processes of determining importance and synthesizing are especially central to organizing strategies. At a most basic level, jotting numbers (1, 2, 3, etc.) in the margin to identify a listing of key points or ideas is an organizing move.

Outlining

Outlining is a familiar, albeit intensive, method of organizing one's reading. The reader identifies superordinate and subordinate ideas and information and arranges them according to their relationships with each other. Classic outlining uses alternating Roman numerals, letters of the alphabet, and Arabic numbers, each layer indented to display interconnections of the material. Of course, outlines could follow more informal structures and still visually display relationships in a text. Word-processing programs offer a number of outlining options and have the advantage of liberating a student from the tedium of writing outlines; the computer versions also visually represent the relationships of entered information more precisely and certainly more legibly.

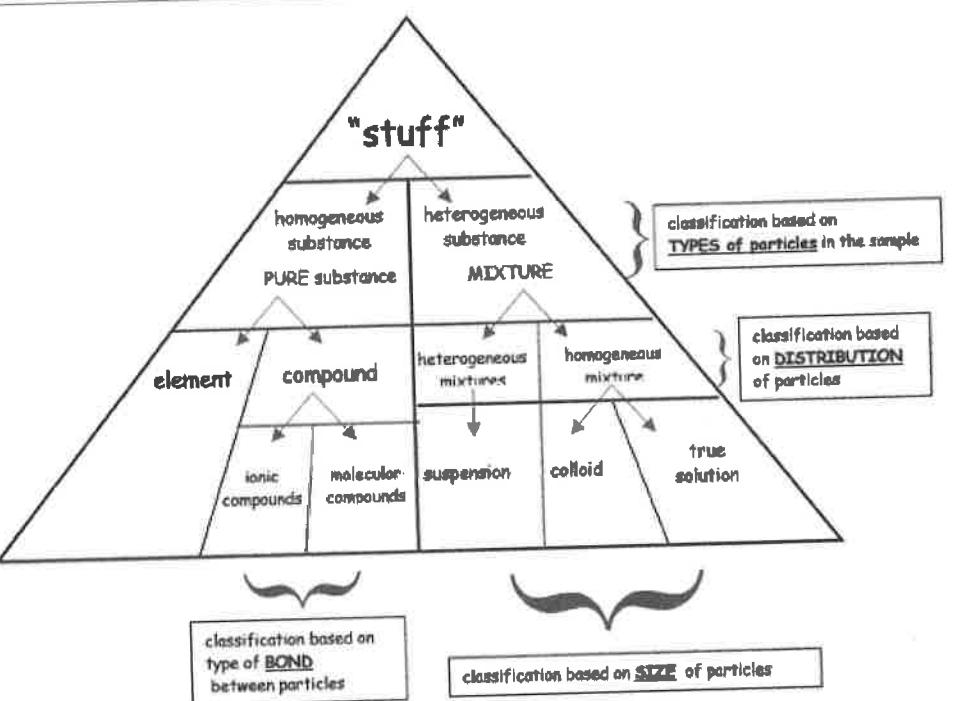
Power Notes, which employ a straightforward Arabic numbering system, is particularly easy for students to use. Figure 6.8 presents a portion of Power Notes created for a foods and nutrition class. A power 1 is a main idea or concept; a power 2 is an example, category, or elaboration of a power 1; a power 3 is an example or elaboration of a power 2; and so forth. (Power Notes are more extensively explained and modeled in Buehl, 2009a).

Figure 6.9 presents a second variation of Outlining, which follows a Structured Overview format. In this instance, students constructed a

Figure 6.8. Power Notes Outlining a Text Passage on Nutrients

1. Nutrients from foods
2. Carbohydrates
 3. Body's main source of energy
 4. Mostly obtained from plants
 4. Simple: Sugars
 4. Complex: Starches
2. Fats
 3. Body's source of stored energy
 3. Provides insulation for body
2. Proteins

Figure 6.9. Structured Overview of Chemical Substances



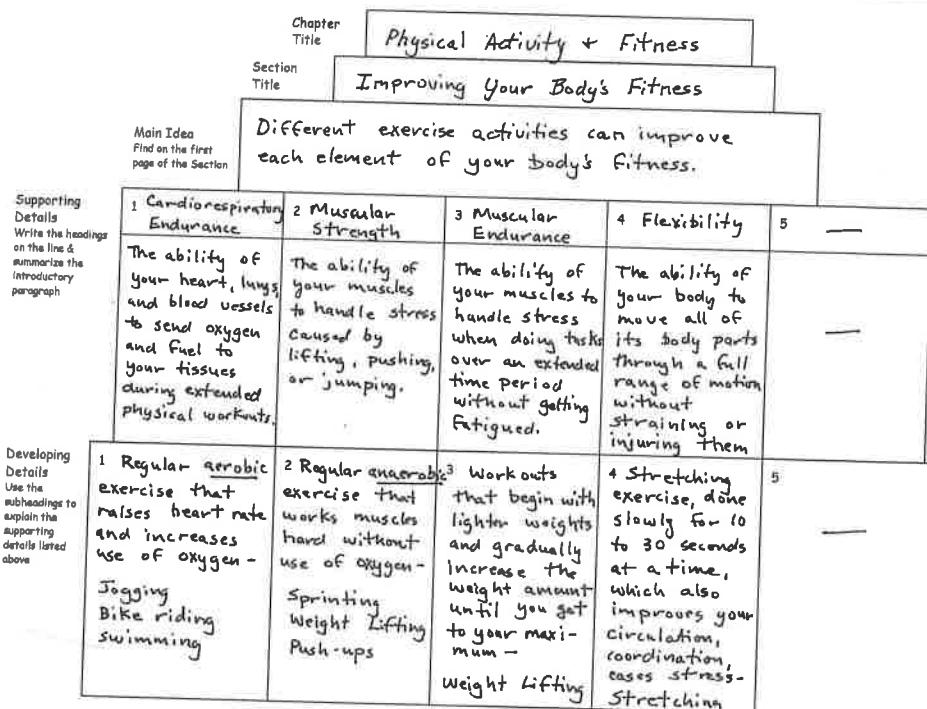
Note. Courtesy of Katie Johnson, Madison East High School, Madison, WI.

hierarchy of relationships among chemistry concepts, configured as a graphic representation. The visual display addressed the abstract nature of the text and guided students to clearly articulate to themselves how concepts are interconnected. You can see elements of outlining being applied in this process. Again, elaborating and organizing moves that support summarizing understanding are emphasized as students work their understanding.

Figure 6.10 combines outlining with note-taking and graphic representations. The pyramid notes in this fitness example are customized to walk readers through the organizational features of a specific textbook, spotlighting relationships among key information that should be integrated into students' notes.

The key element of using any outlining practice is thinking about the relationships among ideas and information. Asking students to copy

Figure 6.10. Pyramid Notes on Fitness



Note. Adapted from a strategy by Jada Callahan, Middleton High School, Middleton, WI.

a previously prepared outline that is projected on a screen or written on the board, however, is not an organizing move but rather a rehearsal action because students are not engaged in discerning the relationships themselves. Outlining may have generally fallen out of favor as a classroom practice for working a text, but the process certainly takes students deep into examining the relationships among textual information. I can recall spending a considerable chunk of time creating outlines of geography textbook sections during my middle school years. We were assigned to outline the material, in lieu of answering questions, which really involved us in closely examining the relationships among ideas and details. (Chicle, a type of tree sap, was a major export of Guatemala that was manufactured into chewing gum—a tenacious fact from one of these outlines that I will always remember.) A perennial central question is, What will students do with the outline once it is created? How will the outline be instrumental in helping students address essential questions and synthesize understanding? Otherwise, an awful lot of work has gone into merely lining up details on a page. Outlining is especially well suited for texts that are structured around classification and description of concepts, such as many science texts.

Text Frames

Organizing strategies based on text frames are particularly powerful (T.H. Anderson & Armbruster, 1984). Text frames represent how texts are tied together; they are the internal structure of ideas, information, and details of a text. Jones, Palincsar, Ogle, and Carr (1987) have presented six transcendent text frames, which are detailed in Table 6.2. Students may feel that many informational texts they read in disciplinary contexts are generally random disgorgements of stuff rather than discussions of key relationships that provide details and facts to flesh out these relationships. In Chapter 5, for example, I discussed how using cause-effect text frames in science leads to text coding the cause (C) and effect (E) relationships within a science text. (See the example presented in Figure 6.11.) Text coding based on text frames brings to the surface the cause-effect dynamics of text, a strong illustration of an organizing strategy. Likewise, annotating “problem,” “cause of problem,” “effect of problem,” and “solutions” in the margin or on sticky notes next to appropriate text segments in a history text that displays problem–solution relationships is another strategic move that uses text frames for organizing understanding.

Table 6.2. Text Frames and Questions

Text Frame	Sample Questions to Ask
<i>Problem–Solution Frame:</i> The author emphasizes problem solving.	<ul style="list-style-type: none"> • What is the problem? • Who has the problem? • What is causing the problem? • What are the effects of the problem? • Who is trying to solve the problem? • What solutions are recommended or attempted? • What results from these solutions? • Is the problem solved? Do any new problems develop because of the solutions?
<i>Cause–Effect Frame:</i> The author emphasizes why something happened.	<ul style="list-style-type: none"> • What happens (or happened)? • What causes it to happen? • What are the important elements or factors that cause this effect? • How do these factors or elements interrelate? • Will this result always happen from these causes? Why or why not? • How would the result change if the elements or factors are different?
<i>Goal/Action/Outcome Frame:</i> The author emphasizes steps that are followed.	<ul style="list-style-type: none"> • What is the goal? What is to be accomplished? • Who is trying to achieve this goal? • What actions/steps are taken to achieve this goal? • Is the sequence of actions/steps important? • What are the effects of these actions? What happens? • Were these actions successful for achieving the goal? • Are there unexpected outcomes from these actions? • Would other actions have been more effective? Could something else have been done?
<i>Compare/Contrast Frame:</i> The author emphasizes similarities and differences.	<ul style="list-style-type: none"> • What is being compared and contrasted? • What characteristics are compared and contrasted? • What makes them alike or similar? • What makes them unlike or different? • What are the most important qualities that make them similar? • What are the most important qualities that make them different? • In terms of what is most important, are they more alike or more different?
<i>Concept/Definition Frame:</i> The author emphasizes conceptual understanding.	<ul style="list-style-type: none"> • What is the concept? • What category of things does this concept belong to? • What are its critical characteristics? • How does it work? • What does it do? • What are its functions? • What are examples of it? • What are examples of things that share some but not all of its characteristics?

(continued)

Table 6.2. Text Frames and Questions (continued)

Text Frame	Sample Questions to Ask
Proposition/ Support Frame: The author emphasizes developing an argument.	<ul style="list-style-type: none">• What is the general topic or issue?• What viewpoint, conclusion, theory, hypothesis, or thesis is being proposed?• How is this proposition supported?• Are examples provided to support the proposition?• Are data provided to support the proposition?• Is expert verification provided to support the proposition?• Is a logical argument provided to support the proposition?• Does the author make a sufficient case for the proposition?• What are alternative perspectives to the author's proposition?

Note. Adapted from *Classroom Strategies for Interactive Learning* (3rd ed., pp. 23–24), by D. Buehl, 2009, Newark, DE: International Reading Association. Copyright 2007 by International Reading Association.

Figure 6.11. Text Coding Cause–Effect Relationships in a Physical Science Text

The region near the equator, extending about 20° north and south, is known as the tropics. The Sun's rays hit Earth with the greatest intensity here. The tropics, which are predominantly oceanic, absorb a lot of heat.

C Warm tropical water transfers energy to the air. The air **E** warms and expands. Hot air is less dense and **E** rises into the atmosphere. Warm air does not rise in **C** only one place, like smoke from a fire. **Air** rises like the smoke from thousands of fires all the way **around the world** in the tropics.

Note. Full Option Science System (FOSS) text selection from *Weather and Water Resources: Images, Data, and Readings* (p. 53), by Lawrence Hall of Science, 2004, Nashua, NH: Delta Education. Copyright 2004 by the Regents of the University of California.

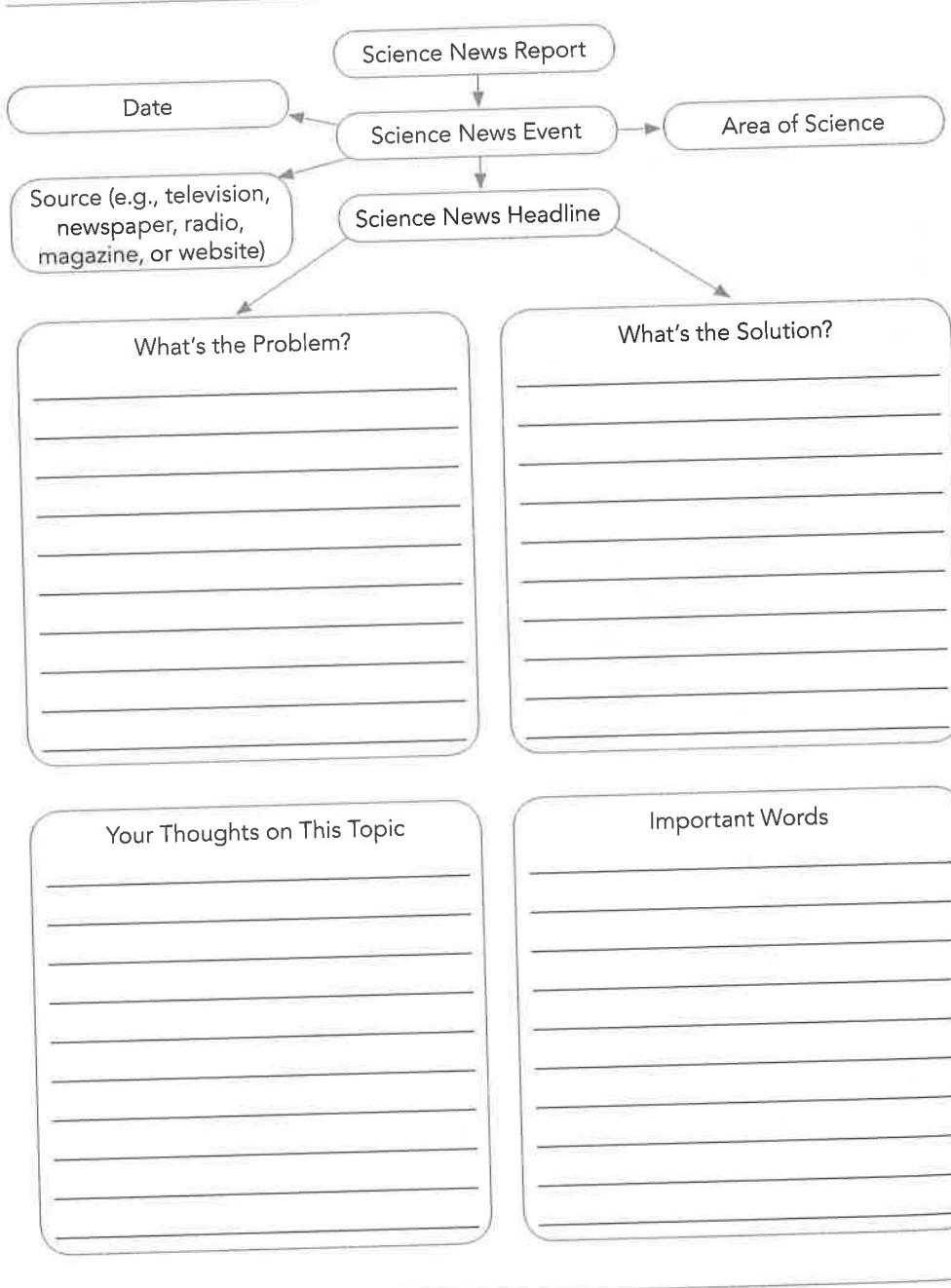
Graphic Representations

Graphic representations are visual displays of key ideas and details, such as a table, flowchart, matrix, grid, concept map, cycle diagram, or hierarchy pyramid. To be effective, graphic representations must be more than chaotic webs or random arrays of geometric figures, such as circles and rectangles, into which details are recorded. Instead, graphic organizers are a means for selecting items deemed especially important and then displaying these items so that relationships are readily apparent. For example, creating a chart of the qualities and salient details of major characters in a novel allows for remembering who is who as well as setting up distinctions and comparisons between these characters, a strategy especially helpful with novels in which a multitude of characters pop up again and again (sounds suspiciously like the Dostoevsky book I read earlier this year).

Graphic organizers are the most widely implemented instructional strategy that uses text frames. Text frame relationships should be clearly prompted by graphic organizers that are created for student use. For example, Figure 6.12 shows a science graphic organizer that guides students in identifying problem–solution relationships as students locate science articles that involve some sort of problem-solving issue with science implications. In contrast, Figure 6.13 also targets problem–solution thinking but, in this case, is tailored for history texts. Notice that this graphic organizer guides students into perceiving and recording problem-solving relationships in history texts as students follow the story lines of different groups of people during a significant period of history. In addition, this history graphic organizer emphasizes change, one of the five key facets of the Thinking Like a Historian model presented in Chapter 5 (see pages 188–189). In this example, students track the story lines of three different immigrant groups in the United States. As the story lines are fleshed out, students are able to perceive how the immigrant experiences of these different groups contrasted with each other and notice the different change dynamics for each group. The graphic organizer prompts students to be sensitive to six categories of change that can affect people: population, technology, environmental, economic, political, and beliefs.

Graphic organizers are most effective as an organizing move when they are created by the readers themselves rather than provided by the teacher as a reading activity. However, students need plenty of

Figure 6.12. Problem–Solution Graphic Organizer for a Science News Report



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Figure 6.13. Problem–Solution Graphic Organizer for a History Text

Who (Group)?	What Problems Did They Face?	What Changes Affected These People (Population [Pop], Technology [T], Environmental [En], Economic [Ec], Political [Pol], and Beliefs [Bi])?	What Did They Do to Solve Their Problems?
European Immigrants	<ul style="list-style-type: none"> In Europe, overcrowding, lack of jobs, food shortages, not enough land, poverty, religious persecution Were unskilled workers Difficult passage to the United States in steerage section of ships Subjected to medical inspections and legal interview Could be detained and sent back Little money and education Not welcomed in the United States; nativist movement opposed them Workers feared immigrants would take their jobs. 	<ul style="list-style-type: none"> Rapid population growth in Europe (Pop) Lack of jobs and land in Europe (Ec) More people wanted freedom and control over their lives. (B) New industries in the United States made jobs available. (T) Factories hired unskilled workers. (T) Immigrants brought new ideas and beliefs to the United States. (B) U.S. population growing, with many foreign languages and customs (Pop) Quota laws passed (Pol) 	<ul style="list-style-type: none"> Left Europe to immigrate to the United States Settled with others from home country and relatives Many got jobs in factories. Worked hard to get ahead Lived in crowded areas of large cities, with many people sharing space in tenements Received assistance from immigrant aid societies Turned to political bosses for assistance in large cities Became increasingly assimilated, learned English
Asian Immigrants	<ul style="list-style-type: none"> In China, overcrowding, lack of jobs, food shortages, lack of opportunity, poverty Were unskilled workers Were mostly men not families Usually detained, and 10% denied entrance and sent back Little money and education Prevented from becoming U.S. citizens Subjected to mob violence, prejudice, hostility, discrimination, and segregation 	<ul style="list-style-type: none"> Rapid population growth in China (Pop) Lack of jobs in China (Ec) More people wanted freedom and control over their lives. (B) Shortage of farm laborers in the United States (Ec) Railroad hired unskilled workers. (T) Encountered racist attitudes (B) California economy falls into depression, and Chinese blamed. (Ec) Chinese Exclusion Law passed (Pol) Angel Island Immigration Station established for Asians (Pol) 	<ul style="list-style-type: none"> Settled in the West Coast of the United States Worked on railroads, in mining, on farms; prospected for gold Did work others refused to do, such as stoop labor harvesting on farms Were willing to work for less money than were other workers Lived together with others from home country Tried to evade exclusion laws and come to the United States Tried to cope with racism in communities, assimilated less

(continued)

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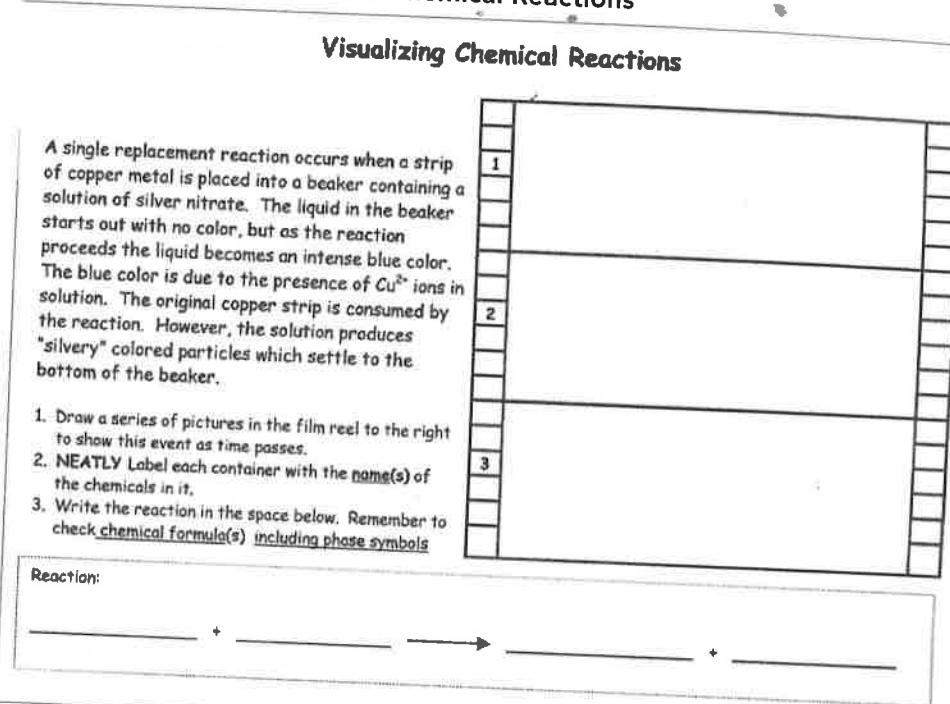
Figure 6.13. Problem-Solution Graphic Organizer for a History Text (continued)

Who (Group)?	What Problems Did They Face?	What Changes Affected These People (Population [Pop], Technology [T], Environmental [En], Economic [Ec], Political [Pol], and Beliefs [B])?	What Did They Do to Solve Their Problems?
Mexican Immigrants	<ul style="list-style-type: none"> • In Mexico, lack of jobs, food shortages, lack of opportunity, poverty, civil unrest • Were unskilled workers • Little money and education • Treated as cheap labor • Kept in low-level jobs • Subjected to racism, prejudice, hostility, discrimination, and segregation • Commonly denied access to public facilities, such as restaurants 	<ul style="list-style-type: none"> • Population growth in Mexico (Pop) • Lack of jobs in Mexico (Ec) • Mexican Revolution and conflict between political groups (Pol) • Shortage of farm laborers in the United States (Ec) • Irrigation expanded farming. (T) • Encountered racist attitudes (B) • Higher wages in the United States (Ec) • Chinese Exclusion Law passed, causing need for new laborers (Pol) • Railroads made travel to the United States easier and faster (T) • Length and isolation of border with the United States, hard to enforce laws (En) 	<ul style="list-style-type: none"> • Settled in western United States, especially California and Texas • Worked on railroads, in mining, in canneries, and in construction • Became agricultural migrant workers for farms and citrus groves • Were willing to work for less money than other workers were • Crossed U.S. border unchecked • Settled in areas that were historically Spanish speaking • Built communities and spread their culture in the United States

well-designed models of useful graphic displays of information before they can be expected to develop coherent graphic reformulations of text that mesh with thinking through a disciplinary lens. Students need to transition from filling out graphic organizers designed by others to deciding how to visually represent their understanding themselves.

Other forms of visual representations also qualify as organizing strategies. Drawing a diagram, creating a structured overview that categorizes disciplinary vocabulary and information from a text, doing a quick sketch, or any other way of translating prose into a meaningful visual rendition engages readers in developing their personal moves that elaborate and organize. Figure 6.14 engages students in translating the abstract language of chemistry into a three-step film reel sequence as a

Figure 6.14. Quick Sketch of Chemical Reactions



Note. Courtesy of Katie Johnson, Madison, East High School, Madison, WI.

prelude for balancing the chemical reaction. In addition to determining importance and synthesizing, this literacy practice emphasizes the comprehension process of creating mental images.

Scaffolding Reader Moves Into Disciplinary Instruction

What are the preferred moves that insiders make to work texts in your discipline? To what extent are these insider moves central to the classroom tasks asked of readers of the texts of your discipline? Earlier in the chapter, we made the analogy to moves made by athletes as they work their “game.” How can we mentor our students to work their game as readers, writers, and thinkers in different disciplinary contexts?

At this point, it is realistic to recognize the disconnect between the ambitious reader moves envisioned in this chapter that are the heart of

working a complex text, and the preferences of many of our students, which are to read with as little exertion as possible with tasks that are easily accomplished, or not read complex texts at all, with the teacher telling and showing the predominant mode of encountering new content. Some of our students have developed cognitive and metacognitive strategic behavior, which guides their thinking as readers and informs their use of rehearsing, elaborating, and organizing actions to reach understanding. However, many students, including a substantial number of our college-bound learners, as discussed in Chapter 1, do not exhibit such a repertoire of internalized strategic moves as readers.

In Chapter 2, I presented three typical yet ineffective disciplinary reading behaviors:

1. *Skimming for answers*: The reader move is to do a quick surface scan for key textual indicators, such as bold print, to locate something to write down.
2. *Surface processing*: The reader move is to plow through without stopping, regardless of whether comprehension is occurring.
3. *Reading and forgetting*: The reader move is to rapidly finish without engaging in deeper processing.

If a task assigned to reading a text permits any of these three ineffective sets of reader moves, then the likelihood is high that many students will opt for moves that merely get them done with an assignment.

Guiding Thinking Through Interactive Reading Guides

Interactive Reading Guides explicitly cue the foundational comprehension processes—making connections to background knowledge, generating questions, creating sensory images, inferring, determining importance, and synthesizing—and are constructed with the assumption that this thinking will be challenging for many students to tackle independently as homework assignments, given the complexity of a specific text. In addition, rehearsing, elaborating, and organizing moves are integrated into the prompts on the guide.

Interactive reading guides (Buehl, 2009a; Wood, 1988) provide a scaffolded context for students to work a complex text as partners or perhaps teams of three or four. In effect, an interactive reading guide scripts

a text and walks students through it, as if a tour guide was conducting their way through the material. The interactive reading guide borrows from the QtA strategy, described in Chapter 5, by pausing students after reading a short segment (e.g., a sentence, a paragraph, a couple of paragraphs) and prompts thinking that engages readers in working toward comprehension. Students are also directed toward visual and graphic information, such as photographs, illustrations, charts, and graphs.

In Chapter 5, I refer to think sheets as a contrast to the worksheets and study guides that students are often asked to complete as they read disciplinary texts. Table 6.3 offers a comparison between traditional worksheets and study guides, and interactive reading guides. A major difference is that an interactive guide is designed to be completed collaboratively, as students are working in the zone area of the Gradual Release of Responsibility process, where they need to problem-solve, engage in discussion, and construct an understanding of what an author is telling them. Obviously, not all of the texts that we use in our different disciplines need to be read as collaborative activities, but to mentor students as thinkers and support them as they read especially difficult but vital texts, interactive readings are a powerful option to merely telling students the information.

Figure 6.15 is an example of an interactive reading guide created for middle school students studying physical science. Notice that it was designed for partners and that the partners are assigned separate tasks during the working of the text. Comprehension processes are clearly indicated for each item to reinforce metacognitive awareness of the nature of the thinking being prompted. For example, the first item engages students with making connections to prior knowledge and learning by

Table 6.3. Comparing Traditional Study Guides and Interactive Reading Guides

Traditional Study Guides	Interactive Reading Guides
Literal focus on getting the facts	Stimulate thinking about information
Emphasis on content	Teach how to learn while learning
Individual centered	Collaborative problem solving
Discussion after reading	Discussion during reading
Look for answers	Consider author intent (why)
Memorization and answer questions	Synthesis: Construct knowledge

Figure 6.15. Interactive Reading Guide on the Solar System

1. **Work together:** Make connections: Think of what you already know about the solar system. Create a Knowledge Ladder by using each letter in the term *solar system* to complete a word or phrase that has a meaningful connection to the solar system.

S
O
L
A
R
S
Y
S
T
E
M

2. Open your books to page 84: "The Solar System in a Nutshell." What a strange title! **Work together:** Infer: Make a prediction about what this section is likely to be about.

3. **Both partners:** Read the first paragraph on page 84 silently. Determine importance: Decide what the author's purpose is for this chapter. Write about what the author wants readers to get out of the text.

4. **Creating mental images:** The second paragraph is written to help readers visualize how the solar system began. **Partner A:** Read this paragraph aloud. **Partner B:** Use your imagination as you listen to your partner to see each stage that the author describes.

The author uses descriptive words like *spin*, *carousel*, and *whirligig* in this paragraph. Both partners explain how these words help you imagine what matter was doing when the solar system was being formed.

5. **Both partners:** Determine importance: List what happened during each of the four stages of the formation of the solar system.

1st
2nd
3rd
4th

6. **Partner B:** Read the third paragraph aloud. **Partner A:** As you listen to your partner, decide what a person should know from this paragraph. (Hint: It is usually not an exact fact!) Share what you were thinking. **Both partners:** Determine importance: Write one thing about the sun that a person should know.

7. The fourth paragraph starts with the statement "The sun rules." **Both partners:** Infer: Predict and write what the author means by this statement.

The rest of the paragraph describes several cause-effect relationships that involve the sun. **Both partners:** Read silently. **Work together:** Determine importance: List four of the cause-effect relationships described by the author.

(continued)

Figure 6.15. Interactive Reading Guide on the Solar System (continued)

Cause	Effect

Both partners: Questioning: Write down two things that you are wondering about the sun based on what the author has told you in this paragraph.

1st Question:
2nd Question:

8. **Both partners:** Read silently the first paragraph on page 85. Making connections: The author wrote this paragraph in 2001, but scientific knowledge has changed since then. Decide what knowledge needs to be corrected in this paragraph.

9. **Partner A:** Read the second paragraph on page 85 aloud. **Partner B:** Listen for clues for what the word *terrestrial* might mean. **Both partners:** Infer: There are details in this paragraph that hint at the meaning of *terrestrial*. Write down your explanation of the word. (Hint: The author will compare these planets with gas giants.)

10. **Partner B:** Read the third paragraph aloud. **Partner A:** Listen for how the terrestrial planets were formed. **Work together:** Summarize: Explain in a single sentence how these four planets were formed, using the following terms: *gravitational attraction*, *sun*, *collision*, *lighter materials*, *rocky matter*, and *objects*.

11. The next two paragraphs talk about atmosphere and how it changed. **Partner A:** Read the first paragraph silently. Determine importance: Look for the *before* conditions of the atmosphere. **Partner B:** Read the second paragraph silently. Determine importance: Look for the *after* conditions of the atmosphere. **Work together:** Share your understandings of the *before* and *after* and write them down.

Atmosphere Before	Atmosphere After

12. The first paragraph under "Gas Giants" introduces these planets. **Both partners:** Read silently. **Work together:** Questioning: Write one thing that you are wondering about the gas giants.

13. The next paragraph has a great deal of technical details. An important word is *volatile*, which the author has used before. It has something to do with these gases. **Partner A:** Look up the word *volatile* and read the definitions aloud. **Partner B:** Infer: Decide which definition makes the most sense in this paragraph and write it down.

(continued)

Figure 6.15. Interactive Reading Guide on the Solar System (continued)

Both partners: Read this paragraph silently. **Work together:** Once again, this paragraph describes cause–effect relationships about the planets called gas giants. **Determine importance:** Locate and write down three cause–effect relationships.

Cause	Effect

involving the students in constructing a knowledge ladder around the concept of solar system (see page 127 of Chapter 4 for a description of the Knowledge Ladder strategy). The taxonomy questions for physical science (see Chapter 5) provide the basis for creating items for this guide, especially at identifying cause–effect relationships at the Analyzing level.

Partners will be hard-pressed to skim for answers as a task-completion strategy; instead, they collaborate to read (and reread), deliberate, and decide how to respond to the items. Teachers need only collect partner A's or partner B's interactive guide for evaluation, by choosing either "A" or "B" at the time guides are to be handed in. Because students collaboratively have decided on the best way of responding to each item, either completed guide should be equally representative of their joint efforts. Hence, all students are aware that their guide might be the one used to evaluate the partner work, so all students have the responsibility to personally complete their guide with their most complete agreed-upon responses.

Figure 6.16 presents an interactive reading guide created for a high school world history textbook section. Partners would spend multiple days in intensive reading of text segments, engaging in conversation and working out their understanding of the period of European history that is referred to as the Middle Ages. In addition to clear labeling of comprehension processes, this guide very explicitly mentors students on the Thinking Like a Historian model outlined in Chapter 5. Icons for the five facets of the Thinking Like a Historian model—cause and effect, change and continuity, turning points, through their eyes, and using

Figure 6.16. Interactive Reading Guide on the Middle Ages

1. Both partners: Read the paragraphs "the Big Picture" on page 320 silently. **Summarize:** What did the Roman Empire leave behind as its legacy?

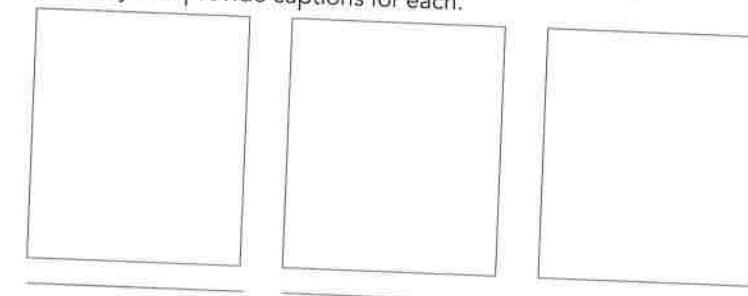
Determine importance: Discuss all of the changes that Europe felt after the fall of the Roman Empire. List at least five of the changes that you discussed.

- 1.
- 2.
- 3.
- 4.
- 5.

2. Partner A: Read the first paragraph on page 321 aloud. **Both partners: Visual representation:** Draw a timeline from 600–1400. Add the date and the event in the 700s for when the Frankish Empire rose to power. (You will add five other events to this timeline as you continue this assignment.)

Partner B: Read "A Powerful Ruler" aloud on page 321. **Both partners:** Add Charlemagne's biggest achievement to your timeline as well as the year it occurred.

3. Partner A: Read aloud "The Growth of Towns" on page 324. **Both partners:** Add the events from 1000 to the 1200s to your timeline. **Creating mental images:** Draw three changes in Europe's economy and provide captions for each.



Determine importance: List the advantages and disadvantages of town life.

ADVANTAGES

DISADVANTAGES

4. Partner A: Read "Town Craftworkers" aloud. **Partner B:** Read aloud "European Cities" on pages 324–325.

Creating mental images: Imagine that you are a 12-year-old serf. In a paragraph, explain four or more reasons why you might wish to be a carpenter's apprentice. Then, in a paragraph of at least five sentences, describe the house that you live in and the neighborhood that you would call home.

(continued)

Figure 6.16. Interactive Reading Guide on the Middle Ages (continued)

5. **Both partners:** Read "Popular Songs" on page 325. Infer: Explain what a troubadour is in your own words. Infer: Explain what a minstrel is in your own words.

6. **Take turns:** Alternate reading page 326 aloud. **Both partners:** Add the dates and events for when the Normans invaded England and King John signed the Magna Carta to your timeline.

Determine importance: Which of these events do you feel had the greatest effect on the greatest number of people, and why?

7. **Take turns:** Alternate reading "Many Voices" on page 327 aloud. Infer: Which liberty do you feel freed the most people? Explain why you think so.

8. **Partner A:** Read aloud "The Roman Church" on page 332. Visual representation: Draw a diagram to show the split in the Christian church. Add the names of these two churches after the split and the location where each church was based to your diagram.

9. **Partner B:** Read aloud "Magnificent Cathedral" and the captions by the pictures on pages 332–333. Infer: Explain why tourists would want to visit these cathedrals today.

10. **Both partners:** Read "The First Crusade" silently. Creating mental images: Draw a five-cell cartoon summarizing what you read and add captions to each cell.

11. **Both partners:** Read pages 334–335 silently. Determine importance: List the positive and negative consequences of the Crusades and the Black Death. (Refer to the video notes you have on "The Black Death" and "Newscasts of the Past" for positive consequences.)

CRUSADES	BLACK DEATH
+	+
+	+
+	+
-	-
-	-
-	-

Note. Adapted courtesy of Julie Feltz, D.C. Everest High School, Weston, WI. Icons from Mandell, N., & Malone, B. (2007). *Thinking like a historian: Rethinking history instruction*. Madison, WI: Wisconsin Historical Society. Reprinted with permission of the Wisconsin Historical Society.

the past—are embedded into the guide, reinforcing which element of historical thinking is being elicited with each item in the study guide.

The intention behind Interactive Reading Guides is to provide a template for guiding students' thinking through a challenging text, so they are able to successfully work a reading without having to resort to being told by the teacher what the author said. The assumption is that certain texts would not be effectively read by many students as independent, out-of-class homework, but these texts could be understood if students worked them in collaborative teams. Obviously, interactive reading guides are a time-intensive literacy practice and are best used on occasions when students will struggle with specific texts that are particularly useful for disciplinary learning.

This instructional strategy provides a rich opportunity to mentor students' abilities to mine their understanding as they develop routines for working disciplinary texts. It is important to note that entire texts need not be assigned for this treatment. For example, an intensive examination of a section of, say, the physics text, or even an especially pertinent page or two that develops key concepts, can provide excellent practice for reading through a disciplinary lens without overwhelming readers.

Collaborative Reading

One final comment is in order regarding working complex texts. One of my most significant moves when I am mismatched with an author and struggling to understand is to seek collaboration. That collaborator could be a colleague, a fellow teacher, or another trusted coconspirator. In most cases, my most valued collaborator is my wife Wendy. We frequently ask each other to read something that one of us is working in order to gain additional expertise and another set of perspectives.

I am reminded of a perfect illustration of the two of us working in tandem to comprehend a complex text. We were engaged in one of our home improvement schemes, in this case removing some old windows (a snap with a reciprocating saw) and replacing them with new windows, which we had never done before. The directions for installation, however, were a prime example of an unfriendly technical text. The language careened from *nailing fin*, to *drip cap*, to *brick mould casing*, to *head jamb extrusion*. A straightforward reading did not lead to satisfactory comprehension for either of us, and a gaping opening in the side of

the house beckoned. So, we got down to working the text. We read a sentence aloud and summarized what we thought the author was saying. We clarified terminology by examining the diagrams and inspecting the new window itself. We reread at times. We inferred and drew on previous experiences. We walked through the process, as we were able to understand it, so that we were able to decide exactly what each step entailed, and before we did any permanent or hard-to-undo acts with the hammer and nails. Of course, we also talked; our conversations were about problem solving and seeking understanding. (Well, there might have been a tinge of irritation sprinkled in, too.) We were behaving the way proficient readers behave when comprehension is essential. (For the record, our new windows open and shut, are plumb, and do not leak.)

Reading as a Social Act

If we consider once again the Gradual Release of Responsibility model outlined in Chapter 1, we can see that collaborative work is a central component of gradually developing competence, especially competence with challenging tasks for which support and feedback are essential. We tend to regard reading as solely a solitary behavior, but in so many respects, reading is a social act that extends beyond the interactions between author and reader. When we engage in conversation about a text, especially as we work through understanding, we extend our thinking, engage in concerted problem solving, and expand our capacity to do this work with increasing independence. As you have likely noticed, most of the literacy practices showcased in this book involve collaborative engagements with text, a necessary stage toward reader independence in disciplinary contexts.

Figure 6.17 presents a reader's protocol for mathematics texts that emphasizes collaborative problem solving as students work the math textbook. The Math Reading Keys strategy outlines for students the moves that mathematicians use to work their texts. Students are mentored to regularly apply moves that are particularly critical to reading mathematics texts: sentence-by-sentence reading, clarification of previously learned mathematics concepts, thinking actively with a pencil, and explaining understandings. The last step engages students in verbalizing the discourse of mathematics. The example in Figure 6.18 illustrates how to create flip cards for vocabulary; the front side is reserved for the precise

mathematics definition, and the back side is the student explanation of this concept, which demonstrates his or her understanding. The math reading keys could be displayed as a classroom poster or provided as a laminated bookmark for the math text, as a resource reminder for moves that involve reading, writing, and thinking through a mathematics lens.

Figure 6.17. Math Reading Keys

1. Read carefully to make sure each sentence makes sense.
2. Ask yourself the following questions:
 - a. What does the author assume I already know?
 - b. What concepts are mentioned that I have learned in math before?
3. Stop and summarize each sentence in your own words. Explain all of the math concepts that you have learned before.
4. Reread parts that you are unable to summarize.
5. Discuss the following with a partner:
 - a. Explain what you understand.
 - b. Clarify what you do not understand.
6. Read with a pencil:
 - a. Work any examples provided.
 - b. Reread each section after working the examples.
7. Explain new mathematics terms in your notebook or on cards.

Figure 6.18. Translating Math Terms Into Student-Friendly Explanations

(front of flip card)	(back of flip card)
<p>absolute value</p> <p>The absolute value of a number x is its distance from 0 on the number line. If x and y are two numbers, then the absolute value of $(x - y)$, written as $x - y$, is the distance between the numbers x and y.</p> <p>Symbol for absolute value: x</p>	<p>Explanation of absolute value: Every number is a certain distance from 0, either in a + direction or a - direction. Absolute value is how far a number is from 0. 7 and -7 have the same distance from 0, so they have the same absolute value: 7.</p> <p>Example: $7 - 2$ and $2 - 7$ have the same absolute value: 5. This is because 2 and 7 are five units apart from each other on the number line. Both $+5$ and -5 are five units from 0, so the absolute value is 5.</p>

Note. Absolute value definition from Algebra 1 (pp. 202–203), by Center for Mathematics Education, 2009, Boston: Pearson Education. Copyright 2009 by Pearson Education.

REFLECTION INTERLUDE

What is the repertoire of reader moves that are appropriate for reading the texts of your discipline? What might reading keys look like in your discipline? What might a series of insider moves look like for your discipline if they were provided as a protocol for reading various disciplinary texts (e.g., a poem, a primary document, a set of directions)?

PARTING THOUGHTS AND TALKING POINTS

- If we are to mentor students as readers, writers, and thinkers in our disciplines, then the use of cognitive strategies, metacognitive strategies, and strategic actions need to be integrated into our instruction.
- Modeling followed by scaffolded interactions with complex texts builds increasing independence as well as cognizance of what it takes to work a challenging text toward comprehension.
- Tasks that students complete in conjunction with their reading need to engage them in making strategic moves that parallel how insiders work texts of their disciplines.
- Working complex disciplinary texts often necessitates collaborative efforts between readers if they are to be expected to gain understanding without relying on teacher telling.
- Fostering a disciplinary identity in students is critical if they are to internalize the value of working complex texts and exhibit a willingness to expend the necessary effort to develop their capacities to access knowledge and understanding as readers of disciplinary texts.

CHAPTER 7

Customizing Literacy Practices

Essential Question: How can generic literacy practices be modified to meet the demands of readers and writers in disciplinary contexts?



About midpoint during a recent literacy workshop that I was conducting, one of the high school teachers participating commented, “So, what you are saying is that we need to force students to read in our classes.” Implicit in his statement was that he felt that many of his students would not read unless forced, they would be very resistant to learning through reading, and he was dubious about attaining this objective. Setting aside the pervasive realms of compulsion in education in general—from compulsory attendance, to required subjects of study, to mandated testing, to behavioral codes, to assigned homework and other classroom tasks, and so forth—the issue of forcing students to read is an important one.

My response was to address the emotionally charged reference to force and reframe this action as “to expect.” We need to expect our students to read, and our instruction needs to support this expectation. I am not all that optimistic about forcing students to develop as readers of complex disciplinary texts, especially if the classroom dynamic plays out to be one of powering students rather than empowering them. I would argue that we need to persuade students, indeed convince them, that the ability to independently access a variety of written communications is of considerable worth to them as their lives continue to unfold and as they explore the options that will be available to them in this 21st-century world.

In Chapter 1, I examined how our personal reader profiles have included both choice texts and obligation texts. Of course, many of the texts that students would be expected to read in disciplinary contexts fall under the obligation designation. Furthermore, these texts, as

literacy, the conditions for optimal learning in a comprehensive secondary literacy classroom, and assessment.

Chapters 3 through 6 build on specific components of reading aligned for the evident needs of secondary learners (Chapter 3, "Word Study: The Wonder of Words"; Chapter 4, "Fluency: Finding the Flow"; Chapter 5, "Vocabulary: Making Meaningful Connections"; Chapter 6, "Comprehension: Frontloading and Downloading"). Word study is the analysis of word patterns and structures and facilitates reading fluency, vocabulary, and comprehension for accuracy. Fluency is the ability to read with proper phrasing and flow to sound conversational and is the bridge to comprehension. Vocabulary involves students making connections to new and already known information about a word and demonstrating meanings of new words effectively in oral and written communication. Comprehension is the ability to construct meaning in all aspects of reading. It is essential for secondary teachers and students develop an understanding of these literacy components, as they characterize the processes of effective readers and build the foundation for content understanding and discovery.

Each chapter focuses on a component, offers an overview of the component, and identifies strategies with accompanying techniques for implementation and application. The Appendix provides resources and reproducibles to support educators in implementing the techniques, and the References and Index support educators in accessing and using the text.

Embedded strategy assessments support educators in checking for understanding and collecting evidence of student learning. The CAI framework is demonstrated in each chapter, and teacher understanding is supported through relevant secondary vignettes (teaching examples) in varied areas of content instruction. Relevant research is presented in the initial sections of each chapter, validating the content and aligning with Response to Intervention (RTI) and current reading initiatives. A review of appropriate statements, questions, and prompts (teacher talk) is included for each strategy and accompanying techniques. Using teacher talk aligned both to Bloom's taxonomy (Anderson & Krathwohl, 2001; Bloom, 1956) of questions, statements, and prompts and to Webb's (1999) depth-of-knowledge (DOK) levels encourages readers to think strategically and supports teachers in generating effective inquiry and reflection.

The techniques within each strategy section list the technique's purpose, materials needed, relevant multiple intelligences (Gardner, 1993), and procedure. Most techniques have a supplemental procedure for motivation and engagement. The Motivation/Engagement section identifies and uses one of the multiple intelligences other than those that are highlighted in the main procedure of the technique.

Accompanying resources, reproducibles, and matrixes enable teachers to efficiently and effectively enhance understanding for challenged learners as well as maximize learning for all students. This organizational structure is ideally aligned to the subject matter by providing a secure foundation of relevant adolescent reading research, addressing all content areas of instruction, providing adaptable graphics, and, most important, presenting theory and practice clearly in one text.

Chapter 1

Focusing on the Secondary "Whole" Learner

Guiding Questions

- What are the characteristics and instructional needs of the 21st-century secondary learner?
- What are essential considerations in meeting the literacy needs of adolescent learners?
- How can we effectively motivate and engage secondary readers?

Key Terms

- **Metacognitive Thinking:** Consciousness of one's thought and learning processes ("thinking about thinking"). This reinforces understanding the purpose of a lesson and the usefulness of a technique.
- **21st-Century Literacy:** Reading, writing, listening, viewing, and speaking of and with traditional texts and media and also with new social, digital, visual, and informational texts and media.
- **21st-Century Secondary Learner:** One who exhibits a wide mental grasp of the whole-learner standards (e.g., effective communicator, critical thinker) and uses a variety of multiple intelligences.
- **Whole Learner:** A 21st-century secondary learner whose developmental domains are interdependent and occur simultaneously. These developmental domains are the learner's creative/cognitive growth, intellectual/mental and physical health, and social and emotional welfare.

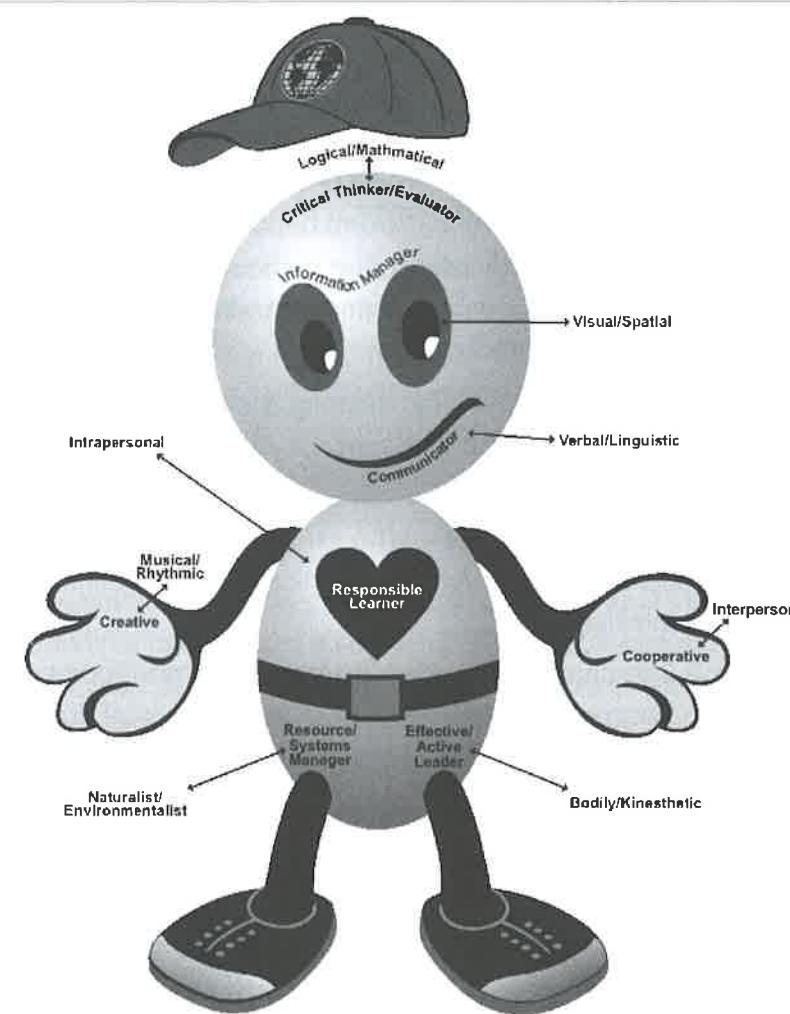
It is our belief that by weaving the challenges surfacing from past educational mandates with instructional guidelines and research-based practices we can effectively educate the secondary whole learner. The focus of *Sustaining Strategic Readers* is to embrace the challenge of educating 21st-century adolescent learners by building and sustaining secondary

literacy competency in the areas of word study, fluency, vocabulary, and comprehension. It is time for targeted literacy embedded in content area instruction. As secondary educators, we are called to meet the learning needs of a diverse community of learners by cultivating our students to become strategic, motivated, engaged, technologically literate, and self-directed learners.

What Are the Characteristics and Instructional Needs of the 21st-Century Secondary Learner?

The ultimate goal is for learners to exhibit a wide mental grasp of the 21st-century literacies. We need to reach and teach the whole learner. By *whole learner*, we are referring to a 21st-century secondary learner whose developmental domains are interdependent and occur simultaneously. Figure 1.1 illustrates the composition of a 21st-century secondary learner. To

FIGURE 1.1. Composition of a 21st-Century Secondary Learner



teach the whole learner, educators have to know *who* they are teaching. Table 1.1 describes a way of looking at the components of a whole learner. Educators can use this framework to SPICE up their understanding of the developmental domains of the whole learner. Responsive educators recognize that adolescents "deserve educational experiences and schools that are organized to address their unique physical, intellectual, emotional/psychological, moral/ethical, and social developmental characteristics and needs" (Caskey & Anfara, 2007, p. 3).

The whole-learner standards are the processes and abilities that help the 21st-century secondary learner apply specific content knowledge to real-world situations. These standards are information manager, communicator, critical thinker/evaluator, creative learner, effective/active leader, cooperative worker, responsible learner, and resource/systems manager. Table 1.2 describes the multiple intelligences aligned to these whole-learner standards. According to Gardner (1999), "Intelligence is a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (p. 34). The multiple intelligences are comprehensive categories of different ways to demonstrate intellectual ability.

When educators assess the whole learner using the lenses of multiple intelligences, whole-learner standards, and the SPICE developmental domains, the evidence they glean will guide the educators toward reaching and teaching their students successfully. We know that all students do not think and learn the same way.

TABLE 1.1. Adding SPICE to the Developmental Domains of the Whole Learner

Domain	Description
S	The ability to form attachments, associate with others, cooperate, share, and create lasting relationships in a structured environment for socialization.
P	The development of fine (small) and gross (large) motor skills. Psychological changes that occur in the body, such as puberty.
I	The ability to sense the world through an intellectual (thought and reason) capacity. Innate sense of curiosity and wonder.
C	The development of special abilities and creative talents, such as music, art, writing, and reading. It is a way for self-expression and a springboard for problem solving.
E	Development of self-awareness, self-confidence, and the ability to cope with one's feelings, as well as having empathy for others.

Note. Adapted from Godbey, 2008

TABLE 1.2. Comprehensive Multiple Intelligences Matrix

Whole-Child Standards/Multiple Intelligences	ABILITIES What they are able to do...	INTERESTS What they like to do...	MOTIVATION How to enthuse them...	COGNITIVE ENGAGEMENT How they actively think...	TEACHER TALK How to communicate with them...	ASSESSMENT How to know if they can do it...
VISUAL Spatial (Information Manager)	• Perceive the visual; locate and organize relevant information; relate to size, area, or positions	• Design • Draw, doodle • Observe • Paint	• Cartoons • Collages • Images • Multimedia • Visual aids • Virtual reality games	In pictures... • Mental images • Graphic organizers • Spatial orientation	• Visualizing in mind's eye • Illustrating • Interpreting • Representing	• Visual metaphors and analogies • Checklists • Graphs • Rubrics
VERBAL Linguistic (Communicator)	• Communicate for a given purpose, subject matter, and audience; storyteller	• Read and write • Format stories • Write in a diary • Debate • Tell stories	• Best-selling books • Word games • Blogs/wiki • Peer counseling • Humor • Dialogue	With words... • Elaborative • Expressive • Symbolism	• Convincing • Describing • Explaining • Translating • Identifying • Listing	• Surveys • Interviews • Word associations • Linguistic humor
LOGICAL Mathematical (Critical Thinker/Evaluator)	• Use reason and identify problems that need new and different solutions	• Experiments • Puzzles • Brain teasers • Analyze abstract relationships	• Graphing • Evaluating • Calculating • Exploring • Researching	• Reasoning, inductive and deductive • Quantifying • Critically • Logically	• Analyzing • Calculating • Distinguishing • Verifying • Comparing and contrasting	• Strategic games • Matrices • Mnemonics • Spreadsheets • Problem solve
MUSICAL Rhythmic (Creative Learner)	• Create, understand, and communicate intuitively through music	• Sing and hum • Listen to music • Jingles and raps • Improvise • Compose	• Audiorecording • Rhythms • Musical instruments • Choral reading	• By melody or rhythm patterns	• Creating • Demonstrating • Expressing • Performing	• Tonal patterns • Musical performances • Checklists • Compositions
BODILY Kinesthetic (Effective/Active Leader)	• Control body movements, handle objects, multitask	• Sports • Dancing • Working with hands • Creating things	• Acting • Field trips • Active learning • Role-play	• Interactively • Physically • Globally • Collaboratively	• Acting out • Constructing • Creating • Dramatizing	• Projects • Interviews • Dramatizations
INTER/PERSONAL (Cooperative Worker)	• Recognize and respond to others' moods, motivations, and desires	• Spend time helping others • E-mail, text • Community events	• Reporting • Dialogue • Debate • Peer teaching	• Communicating • Self-reflecting • Metacognitively • Through simulations	• Brainstorming • Role-playing • Sharing • Collaborating	• Group projects • Discussions • Paraphrasing • Buzz sessions
INTRA/PERSONAL (Responsive Learner)	• Self-reflect and have awareness of one's own strengths and weaknesses	• Plan • Imagine • Think time • Problem solve	• Journaling • Learning logs • Independent learning • Goal setting	• In relation to self • Reflection • Imagery	• Concentrating • Imagining • Self-reflecting • Rehearsing "if" statements	• Self-assessments • Independent contracts • Portfolios
NATURALIST Environmentalist (Resource/Systems Manager)	• Distinguish among features of environment	• Backpack • Nature walks • Visit zoos	• Interacting with plants, animals, and other objects in nature	• Systematic • Orderly • Environmental	• Classifying • Analyzing • Investigating	• Charts • Graphs • Systems • Scavenger hunt lists • Classification graphic organizers

It is important to recognize that different learners learn best at different times with different contents and in different contexts. Therefore, a one-size-fits-all, "high-stakes" achievement test may still leave educators and students motivated by the score and not the process of learning (Ellery, 2009, p. 16).

It is imperative that we assess the learner's style and align the proper instructional design to bridge success. There have been numerous studies and findings that refer to the various learning styles that influence students' abilities to make sense of the experience, gain deep understanding, and achieve academic goals (Caine & Caine, 2007; Coffield, Moseley, Hall, & Ecclestone, 2004; Hodgkinson, 2006; Jensen & Nickelsen, 2008; Kohn, 2005; Levine, 2002; Maslow, 1943; O'Connor & Jackson, 2008; Zigler & Finn-Stevenson, 2007).

As we use assessments to gauge what our learners know and need to know, it is necessary that the first step is to *know* our learners. The whole-learner standards and multiple intelligences support educators in discovering the best practices and assessments for achieving this goal. The techniques presented in this book are based on the foundational design of instructing with the knowledge of the whole-learner standards and intelligences to create a comprehensive learning environment.

What Are Essential Considerations in Meeting the Literacy Needs of Adolescent Learners?

The past decade has evinced growing interest in and research on how to most effectively instruct adolescent learners. Adolescents are characterized by their unique literacy needs, which include the following:

- Experiences with relevant and diverse texts
- Opportunities for building relationships
- Discussion and critical thinking opportunities
- Motivating and engaging learning experiences
- A sense of autonomy and identity

(Bean & Harper, 2009; Lenski & Lewis, 2008; National Council of Teachers of English [NCTE], 2004)

As students make the transition into middle school, they encounter academic content discourse in science, mathematics, and social studies, and therefore require richer and more engaging reading instruction (Bean & Harper, 2009; NCTE, 2004). The changing literacy needs of adolescents require instruction in understanding and using complex content materials as well as instructional support for many secondary learners in basic literacy. It is beneficial for secondary teachers to understand the unique needs of adolescent learners and their intellectual development as they align instructional practices to address these

characteristics. In The National Middle School Association's research summary, Caskey and Anfara (2007) describe intellectual development in terms of learners' abilities to understand, reason, and apply abstract thought processes.

How Can We Effectively Motivate and Engage Secondary Readers?

Educators strive to instruct in a manner that intrinsically motivates and engages students through the learning process. Secondary educators we have encountered confirm a decline in the number of readers who are motivated to read compared with the number of motivated readers in elementary classrooms. According to Irvin, Meltzer, Mickler, Phillips, and Dean (2009),

Too often, content area reading and writing assignments engage students in only a cursory way with content. Reading a chapter and answering the questions, writing a formulaic lab report, writing an essay about a topic that is not of interest to the writer, or reading an article and writing a summary are typical content reading and writing assignments that tend to hinder students' active engagement with the content. In addition, assignments that are too vague or too open may not support students' investment in thinking deeply about the content. (p. 16)

To instruct to the whole learner, educators must be keenly aware of the abilities, interests, motivation, and multiple intelligences of the learner. The *ability* of a learner refers to what the student is able to do. *Interest* is what the student wants to do. *Motivation* is what gives the student a reason or passion for a certain behavior. *Engagement* is how the student actively thinks.

To illustrate how a learner can move through the process of having the ability to do something and then becoming engaged in doing it, let us use an analogy of house cleaning. You may have the *ability* to clean your house, but you choose to lie on the couch and watch television. The *interest* may even be there to clean the house. You *want* a clean house, but you are not *motivated* to do the work, so you stay on the couch. But imagine that the telephone rings and your friends say they are on their way over to your house. You now have a *motivation* to get off the couch and start to tidy up. However, you are not thinking about where you are shoving items; you are trying to get the surfaces cleared. To be fully *engaged* in cleaning, you would need to be actively thinking about how best to organize and clean to increase peace in your life.

When educators consider the engagement of the learner, student achievement increases (Brophy, 1983; Dewey, 1913; Fink & Samuels, 2008; Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Jang, 2008; Jensen, 2005; Kohn, 1993; Lavoie, 2007; Skinner & Belmont, 1993). Table 1.3 highlights the concepts of interest, motivation, and engagement. Educators can use the questions within each of these categories as they design lessons that support learners to engage in the learning process. The goal for adolescent

TABLE 1.3. Interest, Motivation, and Engagement

Interest	Motivation	Engagement
The degree to which the student demonstrates curiosity, drive, and passion about the task. • What are the student's passions? • What is the student doing after school or in his or her free time? • What does the student talk about or express most? • When does the student become involved with coming up with answers and responses?	The factors that stimulate and give incentive (intrinsic and extrinsic), reason, and desire for a certain behavior. • Why did the student behave or act the way he or she did? • Does the student initiate action when given the opportunity? • Is the student exerting intense effort in the learning tasks? • Is the student demonstrating enthusiasm and curiosity toward the given learning experience?	The degree to which the student is actively connected to and thinking about the learning experience. • Is the student willingly participating? • Does the student genuinely care about the learning experience? • Is the student actively involved in the outcome of the experience? • Does the student share in the responses of his or her learning?

Note. Adapted from Ellery, V. (2009). *Creating strategic readers: Techniques for developing competency in phonemic awareness, phonics, fluency, vocabulary, and comprehension* (2nd ed.). Newark, DE: International Reading Association.

learners is to become autonomous learners. Autonomous learners can be self-regulated learners, which is the ultimate goal of a strategic reader (Hilden & Pressley, 2007; Paris, Wasik, & Turner, 1991; Parsons, 2008).

To instruct the whole learner, educators need to know the necessary strategies, which we refer to as the *curriculum component* for secondary readers; know their learners, which we refer to as *assessment with teacher talk*; and know which techniques, which we refer to as *instruction*, will support the needs of their learners. The techniques can represent the specific skills and instruction designed to support a strategy.

Creating a Comprehensive Structure for Learning

Guiding Questions

- How does the alignment of curriculum, instruction, and assessment support effective literacy instruction?
- What knowledge and strategies do learners need to be successful readers?
- How can assessment inform meaningful literacy instruction?
- What is the purpose and scope of intervention processes in middle and high schools?
- How can high-quality literacy techniques support the essential strategies of secondary learners?

Key Terms

- **Assessment:** Gathering evidence to determine what the student knows and still needs to know (behavior indicators and teacher talk in Chapters 3–6).
- **Content Area Literacy:** The ability to use reading and writing for the acquisition of new content in a given discipline (e.g., mathematics, science) and to interpret, evaluate, and communicate information in the discipline.
- **Curriculum:** What the student is expected to know and be able to do (strategies in Chapters 3–6).
- **Instruction:** Methods for reaching the readers to ensure that learning occurs (techniques in Chapters 3–6).
- **Strategy:** An ongoing cognitive process encompassing specific skills for content learning; a method toward the goal.
- **Teacher Talk:** Statements, questions, and prompts applied in conversational coaching to encourage reflection and higher levels of thinking.
- **Technique:** An instructional procedure applied to differentiate learning to support strategic reading.

Comprehensive secondary literacy builds on a solid CAI foundation focused on aligning literacy and content learning. According to Parris, Fisher, and Headley (2009), "Content literacy requires skills to extract information and understand concepts in a particular discipline" (p. 9). Curriculum, assessment, and instruction are interwoven, guiding students to become independent learners in academic areas, and they are crucial for enhancing student achievement. Our goal is to educate the whole student through modeling, scaffolding, and applying technological resources. As educators of adolescents, we must commit to exhibiting a grasp of the literacy skills and processes required for secondary students in multiple disciplines. Mraz, Rickelman, and Vacca (2009) state, "Content area reading is no longer regarded by most experts as a matter of reading information from a single textbook. Instead, students must seek, evaluate, and comprehend information from a variety of print and technology sources" (p. 85).

Assessment results validate that some middle and high school students struggle with academic reading. Secondary teachers can provide challenging content literacy instruction that meets the specific demands of their content area while supporting a common instructional language to help students make connections across subjects (Irvin et al., 2009; Moore, 2009). Every subject requires some form of reading, and content teachers should use techniques most appropriate for their area of instruction (Fawcett & Rasinski, 2008). Content area teachers can enhance literacy by taking a leadership role in defining how reading is taught without taking time away from their content curriculum. Irvin and colleagues reinforce that content teachers can make a distinct difference for their students by "shifting instruction from a sole focus on learning content knowledge to the goal of learning content through strengthening content literacy" (p. 41).

C = Curriculum

The initial aspect of CAI within the comprehensive content literacy classroom is curriculum. Educators use a standards-based curriculum as a guide in determining what they want students to know and be able to do. The mission statement for the Common Core State Standards is to

provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy. (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010, p. 1)

These national standards for major subject areas are initiated to work toward states and schools having clear, consistent, and challenging standards of achievement and

accountability. These evidenced-based core standards are drafted to define the knowledge and skills students need to be successful in college academic courses, the workforce, and in a global economy (Common Core State Standards Initiative, 2010).

Clearly communicated standards-based learning targets presented in student-friendly language provide educators and students with a purpose for learning. By crafting instruction using current standards, teachers set and express measurable learning goals that can be used to monitor student progress and applaud successes. Marzano (2010) clarifies the significance of goal setting by stating, "Certainly one generalization is that setting clear and specific goals for learning that are at just the right level of difficulty can greatly enhance student achievement" (p. 12). *Sustaining Strategic Readers* focuses the secondary educator to apply strategies, techniques, and teacher talk within the reading components of word study, fluency, vocabulary, and comprehension. These components are infused within current national (Common Core) and state standards and aligned benchmarks.

What Knowledge and Strategies Do Learners Need to Be Successful Readers?

Table 2.1 identifies the strategies within secondary components that are highlighted in Chapters 3–6. These strategies are enduring common threads that withstand ongoing reading initiatives and programs to support proficient readers. Strategic readers embrace the text and bring meaning to what they are reading. These readers apply reading skills automatically, concentrating on the strategies rather than skills.

A baseball analogy clarifies the relationship between strategies and skills. The first step in becoming a great baseball player is for the person to want to be a proficient baseball player and understand the "why" behind the practices. Coaches instill right away what it takes to be a baseball player—hitting the ball, fielding, and running the bases. These are the strategies, the methods toward the goal. Each strategy encompasses specific skills necessary

TABLE 2.1. Reading Components and Aligned Strategies

Word Study	Fluency	Vocabulary	Comprehension
<ul style="list-style-type: none">• Synthesizing• Analyzing affixes• Analyzing root words• Spelling	<ul style="list-style-type: none">• Phrasing• Scaffolding and Rereading• Expressing• Pacing• Wide reading	<ul style="list-style-type: none">• Associating• Contextualizing• Visualizing• Personalizing• Referencing	<ul style="list-style-type: none">• Previewing• Activating and Connecting• Predicting• Inquiring and Inferring• Determining importance• Summarizing and Synthesizing

to achieve success with it. Baseball players practice individual skills (e.g., positioning of feet, follow-through with swing, changing up position for specific pitches) to become proficient with the strategies. Skills are for drill, not "drill and kill." When learners know why they are practicing the skill, the skill does not kill their motivation to continue engagement with the routine.

Therefore, during practice, learners are more apt to remain engaged when they know that each practice is increasing their chances to become successful in reaching the goal. To be successful on game day, players need to "step up to the plate" and become batters, focusing on the end result—hitting the ball successfully. In doing so, the players use the hitting strategy while applying all of the batting skills acquired in practice and continuing to problem solve while at bat (e.g., changing swing for a curve ball). Authentic practice on the field means having all of the tools necessary (e.g., bat, ball, field) rather than just hearing about playing ball.

Similarly, students practice reading skills necessary for all content area reading (e.g., affixes, reading rate, skim and scan) that support reading strategies (e.g., analyzing words, pacing, previewing). The students also focus on the end goal, which is reading for meaning. In doing so, the students are using the reading strategies while applying all of the skills acquired in authentic practice and continuing to problem solve while reading. This is strategic reading. Metacognitive learners know the stages in the process of learning and understand their preferred approaches to it. They can articulate what they need to do to attain learning goals, and they apply strategies to become successful learners: "Students who achieve well in school know when they have understood, and they know how to employ a variety of strategies to attain meaning" (Santa, 2006, p. 469). Knowing which strategy to apply to comprehend content text allows students to demonstrate their grasp of the curriculum.

Strategy instruction should be embedded within targeted content planning and instruction to support students in making connections among ideas in text (McKeown, Beck, & Blake, 2009). Content literacy and learning are interconnected in the secondary curriculum in various content areas: "Supporting readers as they grapple with the highly specific demands of texts written for different content-areas will help prepare them for citizenship, encourage personal growth and life-satisfaction on many levels, and open up opportunities for further education and employment" (Lee & Spratley, 2010, p. 2). The purpose of literacy is the learning of essential content, and literacy is at the core of secondary curriculum. The commonalities of thinking, reading, and writing underpin the content areas. According to Shanahan and Shanahan (2008), "The different disciplines result in unique challenges for readers" (p. 53). Multimodal learning is necessary for students to meet the challenges of varied forms of text across disciplines. These varied text representations, including digital media and artistic designs, are integral components of 21st-century society as well as a part of the meaning-making process of secondary learners (Ellery, 2009; Jewitt & Kress, 2003; Thompson, 2008; Unsworth & Heberle, 2009). The shift from elementary to secondary school brings with it modifications in the "nature of literacy requirements" (NCTE, 2006,

p. 3). Appropriate interventions and literacy support in content classrooms benefit secondary learners, and our goal should be to provide relevant opportunities for adolescent learners to become engaged in their learning, apply the curriculum, and strategically discover meaning in all content classrooms (Scamacca et al., 2007).

A = Assessment

Assessment is the next component in CAI comprehensive content literacy classrooms. In *Understanding and Using Reading Assessment, K–12*, Afflerbach (2007) reminds us "that reading assessment must have the primary consequence of helping students continue their development as readers" (p. 18). Students and teachers should use a variety of assessments appropriate to their learning environments and should accommodate the assessment purposes (Edwards, Turner, & Mokhtari, 2008; Ellery, 2009; NCTE, 2004). Assessments are essential to determine students' current knowledge base (i.e., strengths and weaknesses), to inform instruction, and to motivate and engage students.

How Can Assessment Inform Meaningful Literacy Instruction?

Educators need to reflect on the purpose of assessment. There is an old proverb that states, "You don't fatten a sheep by weighing it." A shepherd has to tend to and feed his sheep for the flock to grow strong and produce sufficient wool; otherwise, the sheep would not develop properly from lack of nutrition and care. This proverb applies to our students today in the assessment arena of the 21st-century classroom. Educators need time to feed their "sheep" (a.k.a. students) through proper instruction so they can grow academically. A disservice is done when educators assess only to receive raw-score data that is not evaluated to inform instruction. When educators record their student data into their record books or online and continue covering the curriculum without evaluating the data, giving feedback to the students, and using the data to inform instruction, their students have a greater chance of falling into a cycle of failure (Ellery, 2009; Stanovich, 1986). The assessment loses the ability to become a tool for learning and for focusing on the depth of understanding of the learners.

Stanovich (1986) resurfaces the concept of the Matthew effect, which has been frequently related to the failure cycle in reading. The Matthew effect, a term which was first coined by Merton (1968), is related to the biblical passage conveying that the rich get richer and the poor get poorer. When applied to reading, this concept translates as "those who read, read more, and those who do not read, do not read." According to Stanovich, the students who are

reading well and who have good vocabularies will read more, learn word meanings, and hence read even better. Children with inadequate vocabularies—who read slowly and without enjoyment—will read less, and as a result have slower development of vocabulary knowledge, which inhibits further growth in reading. (p. 381)

In other words, as readers encounter difficulties that hinder their reading, the experience becomes less rewarding and can lead to a lack of desire to read. With fewer reading experiences, these learners fall further behind in their development as readers, therefore setting into motion the failure cycle. In his *Reading Research Quarterly* article, Stanovich (1986) questions for further research to determine if "instructional differences are a factor in generating Matthew Effects" (p. 396). Research shows astounding evidence that instructional differences do make a major impact on the reciprocal relationships (Marzano, Pickering, & Pollock, 2001; Nye, Konstantopoulos, & Hedges, 2004).

Assessment is an integral part of effective instruction and a common process for providing students with feedback (Marzano, 2010). Educators and students use multiple types of assessments to reflect on how learning is progressing, see where improvements can be made, and identify next steps. Screening assessments are provided for the general student population so educators can determine deficit areas in students' performances. The National Center on Response to Intervention (2010) defines screening as

brief assessments that are valid, reliable, and evidence-based. They are conducted with all students or targeted groups of students to identify those who are at risk of academic failure and likely needing additional or alternative forms of instruction to supplement the conventional general education approach. (p. 8)

Effective teaching requires using varied forms of assessments to guide decision making and dig deeper to understand student needs. Analyzing multiple assessments is analogous to the frog overlays found in decades of biology textbooks. You begin with a photograph of a frog, and as you add overlays, you see the muscular system, followed by the internal organs, and then the circulatory system. Each layer enriches the view and deepens understanding. Analyses of varied forms of student assessment data provide more windows to guide our instructional practices. This assessment process "keeps students and their teachers in touch with understanding and achievement on a continuous basis, allowing them to know what specific actions they can take to improve learning every day" (Stiggins & Chappuis, 2008, p. 44). Systematically collected and analyzed student data can be used to determine if students are making adequate progress toward learning goals and gauge the effectiveness of instruction. The National Research Center on Learning Disabilities clarifies that progress monitoring should assess the specific skills contained in state standards, be administered repeatedly over shorter periods of time, be applicable to monitor student progress over time, and remain relevant for development of instructional strategies and techniques to address the specific areas of need (Johnson, Mellard, Fuchs, & McNight, 2006).

Assessing Through Conversational Coaching

Conversational coaching is referred to as “teacher talk” throughout this book, and it is embedded in all of the strategies. These statements, questions, and prompts are tools for conversations as educators coach their students in thinking and reading strategically. Students who are given the opportunity to process information through higher order thinking comprehend and store the knowledge for future authentic application far more than students responding passively to lower order questions (Amer, 2006; Anderson & Krathwohl, 2001; Bloom, 1956; Eber, 2007; Ellery, 2009; Kunen, Cohen, & Solman, 1981; Redfield & Rousseau, 1981; Taylor, 2008). Asking students to reflect on and respond to the global understanding of why they are learning specific content is necessary in bringing them to a metacognitive awareness (the ability to think about their learning process).

Chapters 3–6 demonstrate a leveling of teacher talk with each of the component strategies to support deeper learning. The teacher talk is aligned to Bloom’s taxonomy (i.e., creating, evaluating, analyzing, applying, understanding, remembering; Anderson & Krathwohl, 2001) and the hierarchy of Webb’s (1999) DOK levels (i.e., recall, skills/concepts, strategic, extended). Merging the DOK levels extends the taxonomy to determine the context in which the verbs are used and the depth of thinking is required. These levels of thinking describe the progression of what is being taught and learned. According to Confucius, a Chinese philosopher, “He who learns but does not think, is lost! He who thinks but does not learn is in great danger.”

I = Instruction

The final component of the CAI comprehensive classroom is instruction. Effective instruction is all about the “how”—how to ensure that a wide mental grasp of the “what,” which is the curriculum, is occurring with the learner. This is accomplished through concise, meaningful, and, at times, differentiated ways educators engage all learners. Instruction refers to approaches of teaching as well as the learning techniques used to support students’ abilities to self-regulate the content and outcomes specified by a curriculum. This goes far beyond covering the content, as educators guide students to comprehend the curriculum. Effective instruction is responsive to the learners’ needs. It has a system in place for gradual release of responsibility (Pearson & Gallagher, 1983), in which the learning evolves from teacher-directed support to student-directed learning. Table 2.2 describes the strategic learning plan’s instructional components of preparation, initiation, consideration, collaboration, application, reflection, and intersession. This format provides secondary content teachers with an instructional planning guide to ensure that lessons focus on establishing a conducive learning environment (Cambourne, 1995), targeted learning objectives, active learning, collaboration, and reflection on learning.

TABLE 2.2. Instructional Components of the Strategic Learning Plan

Component	Description
Preparation	<ul style="list-style-type: none">Determine the topic, concept, content, or goal and align to standards.Write clear purpose or objective and determine the “why.”Prepare instructional materials and establish an environment conducive for learning.
Initiation	<ul style="list-style-type: none">Create an action that sets the stage for learning.Establish an anticipatory lead-in or grabber.Develop student interest.
Consideration	<ul style="list-style-type: none">Demonstrate in a clear way meaningful initial instruction.Explain and model the “what,” “how,” and “why” of the task.Provide detailed examination of content.
Collaboration	<ul style="list-style-type: none">Provide instructional format for interaction among learners.Support flexible grouping for student teamwork.Engage learners in a shared and guided experience.
Application	<ul style="list-style-type: none">Establish opportunities for partner and independent practice.Make available clear step-by-step procedures for self-regulation.Provide experiences for active engagement and approximations.
Reflection	<ul style="list-style-type: none">Provide a time for students to consider what they have learned and what they would like to learn.Think about the anticipatory set from the initiation and reflect on the learning process.
Intersession	<ul style="list-style-type: none">Present other outside assignments or independent work for continued practice.

Chapters 3–6 incorporate a variety of techniques to support the reading strategies and align with the needs of the learners. The strategies and techniques are listed at the beginning of each chapter. Each technique starts with stating the purpose (the “why”) and is followed by the corresponding multiple intelligences that are incorporated to instruct the whole learner. It is critical that the teacher respond with immediate intense instructional intervention if a student demonstrates levels of weakness in an area. This response accelerates the “mending and repairing” process to bring wholeness to the student experiencing fragmented learning.

What Is the Purpose and Scope of Intervention Processes in Middle and High Schools?

The necessity for effective intervention is driven home in the story of Sam (pseudonym), Jennifer’s former student. Sam was identified as having a specific learning disability (SLD) when he was in the primary grades; he evinced a significant discrepancy between IQ and achievement, and processing deficits were identified. His elementary grades were

characterized by regular classroom placement, daily pull-out for SLD small-group instruction, individualized educational plans, and retentions in both second and fifth grades. For Sam, middle school meant targeted learning strategy classes, mainstream coursework, summer school, and ongoing struggles in decoding and comprehending content texts, often at his frustration level. By high school, Sam was two years older than his grade-level peers.

During Sam's freshman year, a social studies teacher, working with the reading coach, began to model and infuse techniques and strategies to support students to effectively use social studies content text. Sam began to understand the need to self-monitor, establish background knowledge, preview text structure, explore word structures, and track his progress as a fluent reader. Jennifer clearly remembers this young man exclaiming, "I can do this! Why didn't you show me how to do this before now?" As secondary educators, we may be the "last, best chance" for success. How many students such as Sam are in need of intervention in high school content classrooms?

Effective educators are cognizant of learners' needs and reach into their "toolboxes" for multifaceted techniques that support responsive literacy instruction. Intervention processes are being explored by some middle and high schools to improve student achievement outcomes through common elements. Canter, Klotz, and Cowan (2008) capture the following common elements of intervention programs:

- Systematic data collection
- Staff support and training
- Applications of high-quality instructional strategies and techniques
- Collaborative teams
- Parental involvement and coordination and integrations with existing scheduling and intervention programs

A growing body of research on secondary applications of RTI is guiding secondary educators to provide a mechanism for supporting struggling students. Initially designed to provide a systematic and comprehensive evaluation for learning disabilities (LD), RTI is a research-based instructional process that analyzes learning over time and informs decisions about appropriate interventions and the nature of instruction (Allington & Walmsley, 2007; Duffy, 2007). Secondary-level RTI findings are preliminary and focus on reading and writing, yet these approaches may expand beyond a literacy focus and guide secondary school implementation of RTI.

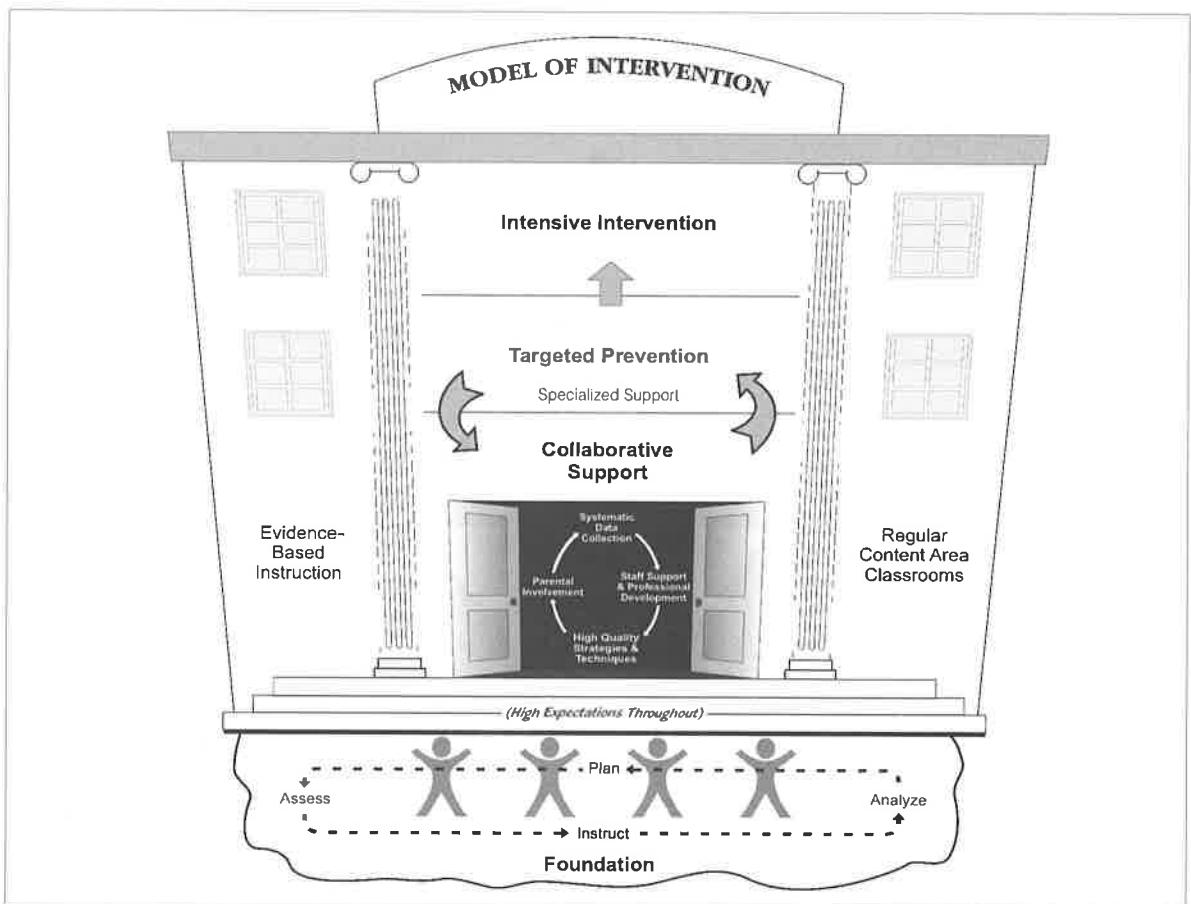
While varied models of RTI exist, a common conceptual framework focuses on the use of high-quality instructional practices, screening and progress-monitoring measures, and data analysis. An emerging body of research recognizes that intervention may include a multilevel intervention approach based on the progress monitoring of struggling adolescent learners. As students get older, they can fall further and further behind. What is essential is the idea that we address the needs of most learners by providing high-quality and culturally responsive instruction in the least intrusive environment (Canter et al., 2008; Duffy, 2009;

Ehren & Laster, 2010; Fuchs & Fuchs, 2008; Johnston, 2010, National High School Center, National Center on Response to Intervention and Center of Instruction, 2010; Rebora, 2010).

Secondary school implementation presents several challenges because of the structure, organization, and culture of middle and high schools. However, according to IRA's Response to Intervention Commission (2010), RTI "must be a part of a comprehensive, systemic approach to language and literacy assessment and instruction that supports all preK–12 students and teachers" (p. 4). Although the essential components of RTI may be consistent, the strategies for implementation may differ. Common implementation hurdles noted by schools include scheduling, staff "buy-in," teacher professional development, availability of resources, and analysis of the fidelity of implementation. Despite these challenges, secondary schools are exploring interventions to address instruction, assessment, use of multiple intervention tiers, and determining research-based services, techniques, and strategies to provide at each level (National High School Center, National Center on Response to Intervention and Center of Instruction, 2010; Rozalski, 2010).

Figure 2.1 is a model of intervention and captures key components as well as initial planning and implementations by secondary schools who have ventured ahead with RTI.

FIGURE 2.1. Model of Intervention



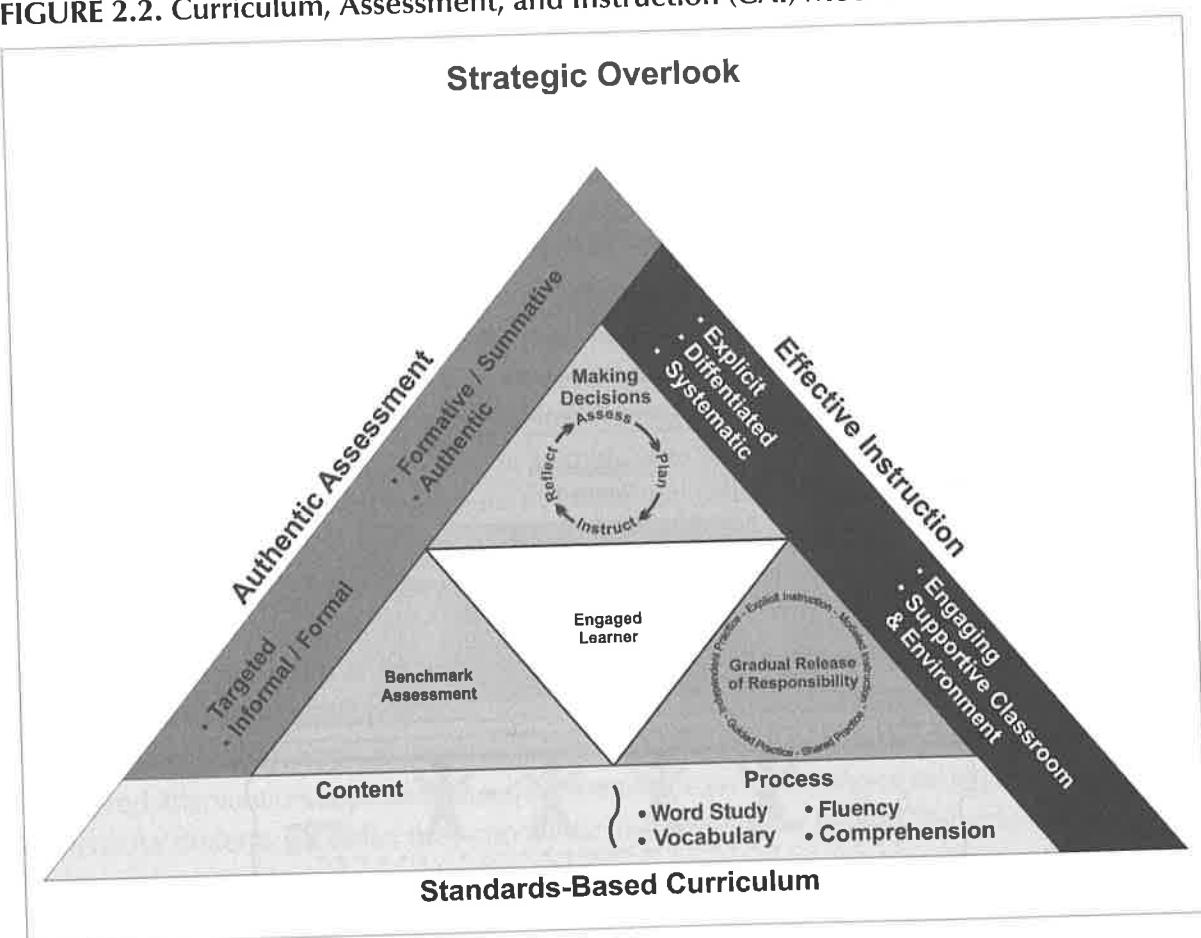
The multilayered approaches are possible models for adaptation and integration. The techniques presented in this book are designed to support research-based strategies to sustain strategic readers at each level as we provide responsive literacy intervention for secondary learners.

The Challenge

Curriculum, assessment, and instruction are core infrastructure components that align to create a highly effective, engaging, and powerful comprehensive content literacy classroom. Figure 2.2 illustrates the cohesive CAI alignment, with the 21st-century secondary learner at the core of the planning and decision-making process. The responsibility for instructing basic reading skills is a task for the reading teacher and specialist, but content teachers can support students toward becoming responsible and strategic readers, critical thinkers, and effective communicators (Irvin et al., 2009).

Educators must meet the challenge to identify the strengths and weaknesses of their students and know how to motivate and engage them in the learning process. Using varied formative assessments to guide instruction allows us to enhance our instructional toolboxes and repertoires of strategies, techniques, and teacher talk to meet the unique needs of our secondary learners. Our goal is for students to “think like content area ‘insiders’” (Buehl, 2009b, p. 229). Literacy support for secondary teachers often seems problematic and misaligned with the needs of content teachers in terms of curricula and schedules. Teachers voice the need for relevant, applicable, and effective professional support as they guide their students in content literacy. It is our hope that you will become encouraged to incorporate this book’s strategies, techniques, assessment guides, and teacher talk in content classrooms to sustain our secondary strategic readers.

FIGURE 2.2. Curriculum, Assessment, and Instruction (CAI) Model



Fluency: Finding the Flow



Expressing with Radio Reading



Scaffolding and Rereading with Partner Reading



Pacing with Rate/Record/Reflect

Fluency is multidimensional and represents a level of expertise in combining appropriate phrasing and applying prosodic functions (i.e., stress, phrasing, tone) while reading words automatically. Johns and Berglund (2006, 2010) describe reading fluency as an essential component to comprehending reading material. Rasinski and Fawcett (2008) expand on this by describing fluency as the ability to read effortlessly and with expression, and knowing when to speed up or slow down to acquire meaning. Readers also demonstrate proficiency through fluency strategies such as reading accuracy, pacing, rereading, and wide reading. A reader's ability to apply these fluency strategies serves as an indicator for acquisition of reading skills and as an outcome for reading proficiency (Klauda & Guthrie, 2008; Samuels & Farstrup, 2006; Torgesen, Rashotte, & Alexander, 2001).

Fluency is an essential goal for secondary readers, indicating the relationship between fluency and comprehension. Bringing meaning to the text is an important element of fluency,

as indicated by Rasinski and Fawcett (2008): "Although studies that demonstrate a correlation between fluency and comprehension do not prove causation, these studies along with others hold the promise that gains in fluency may account for significant gains in comprehension" (p. 158). Middle and high school teachers are recognizing the need for comprehension strategies, as well as reading fluency techniques, to improve their student comprehension and knowledge of academic content. There is a strong correlation between comprehension difficulties and the inability to read fluently, as laborious reading is frustrating and often leads students to avoid reading altogether. Word recognition and reading fluency difficulties are key contributors to 90% of comprehension problems (Rasinski, Homan, & Biggs, 2009). Although caution must be taken in overuse of timed performance, these expectations to increase students' pace have heightened content teachers' awareness of the validity of including fluency strategies in their instruction. However, this awareness does not provide a case for speed reading. Newkirk (2010) points out, "There is great pleasure in downshifting, in slowing down. We can gain some pleasures and meanings no other way" (p. 6). Newkirk further reminds us that we need to savor reading "for enjoying the infinite ways a sentence can unfold—and for returning to passages that sustain and inspire us" (p. 7).

The independent and self-assured reader demonstrates fluency, which can correlate with work completion. The initial step in planning fluency instruction is to select appropriate-level texts in instruction. Attention to the level of text used in the modeling of fluency strategies is critical in aligning text to readers. The fluency techniques presented are most effectively supported within a student's independent or instructional reading levels. Fluency strategies are essential to comprehension and support reading proficiency (Fuchs, Fuchs, Hosp, & Jenkins, 2001; Pinnell et al., 1995; Rasinski, 2006; Samuels & Farstrup, 2006).

To effectively use the fluency strategies and techniques presented in this chapter, ample time should be allotted for teacher modeling, student engagement, and scaffolding of learning. The goal is to structure instruction to support independent application and student ownership of learning.

Teachers can use the Motivation/Engagement section within many techniques as an additional means of motivating the whole learner and creating 21st-century secondary learners (refer to Chapter 1 for a description of the whole learner and to Figure 1.1 for an illustration of the composition of a 21st-century secondary learner). The Motivation/Engagement section allows for differentiation within the technique as needed to meet the needs of all learners. The section identifies and uses a multiple intelligence other than those that are highlighted in the main procedure of the technique.

Educators should use the fluency strategies and techniques within the lesson planning and instructional process. However, it is essential to understand that these strategies and techniques are multifaceted and can be interchangeable within the lesson. The fluency techniques support secondary readers to sustain independence as readers and acquire the reading strategies.

The following are the strategies and techniques in this chapter:

- Phrasing: Chunk-It/Phrased Reading, Slow to Flow, Eye-Voice Span, Pausing Punctuation
- Scaffolding and Rereading: Frontloading, Partner Reading, Integrated Choral Reading
- Expressing: Interpretative Dialogue, Totally Tonality, Radio Reading, Readers Theatre
- Pacing: Rate/Record/Reflect, Beam Reading, Sprints and Stamina, Commercial Programs
- Wide Reading: Volume Reading, Scaffolding, Literary Tours, Content Read-Aloud



Fluency Strategy: Phrasing

Phrasing is demonstrated when a reader sequences several words together grammatically. This grammatical understanding supports the reader's ability to appropriately use syntax (the way words are put together to form phrases and sentences) as a cueing system when reading and to apply *cohesive chunking*. Syntactic cues involve the reader's ability to identify the function of a word (e.g., noun, verb, preposition) and the basic language pattern associated with a group of words. Appropriate phrasal construction, or syntax, of a sentence demonstrates the timing aspect of *prosody*.

When adolescent readers read in a *seamless* manner, they sound like they are holding a conversation as they read aloud to create a *conversational flow*. Their eyes are moving ahead of their voices to capture the essence of the text prior to bringing voice to the print. The *perceptual span* of a fluent reader needs to make shorter *fixations* and have longer *saccades*, which allow generally smooth reading (Drieghe, Pollatsek, Staub, & Rayner, 2008). Fluent readers using the phrasing strategy apply cohesive chunking and move their eyes freely from word to word or phrase to phrase, "so that they perceive a line of text in terms of successively fixated text images" (Martin, 2004, p. 2). Readers who struggle with the ability to phrase speak in a monotone, have little sense of phrase boundaries, fail to attend to punctuation and clauses, and sound choppy when reading orally. Prosody is one of the key indicators to bringing meaning to what is being read.

Key Vocabulary for Phrasing

- Cohesive Chunking: connecting several words to make a meaningful phrase
- Conversational Flow: moving freely from word to word in a relaxed spoken language
- Fixation: the amount of time directing and focusing the eyes to attend to letters or words
- Perceptual Span: the amount of text that is correctly identified during the fixation pause
- Prosody: the ability to read smoothly, with proper phrasing and expression

- Saccade: the jump or movement of the eye from one fixated point to another
- Seamless: perfectly smooth reading

Assessment for Phrasing

Use the following behaviors as a guide as you assess students' abilities to phrase. Do students exhibit these behaviors never, rarely, often, or always?

- Demonstrates the value of forward eye movements and shorter fixations
- Uses punctuation to support inflections
- Reads seamlessly by sequencing words



Teacher Talk: Statements, Questions, and Prompts for Phrasing

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the phrasing strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating
Extended Thinking

Evaluating
Strategic Thinking

Analyzing
Strategic Thinking

Applying
Skill/Concept

Understanding
Skill/Concept

Remembering
Recall

Teacher Talk

- Explain why grouping the words helps to make sense out of why you are reading.
- Describe how attending to the punctuation supports you in bringing meaning to what is being read.
- What would happen if you paused after each word?
- Listen as I read these sentences aloud. I will read them using two different types of phrasing. (*Read sentences in two ways.*) Explain which reading sounds better to you and why.
- Did your punctuation choices alter the meaning of the original text?
- Try to "capture" several words at a time with your eyes ahead of your voice.
- Read a passage and think about the value of forward eye movement when reading.
- Describe the eye movement you have when you are reading.
- What words are in your mind that you are no longer viewing?



Techniques for Phrasing

Fluency:
Phrasing

Chunk-It/Phrased Reading

Purpose: To read content phrases seamlessly and cohesively with appropriate pausing

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic, interpersonal

Materials: Phrase strips or printed text phrases, highlighter, pen or pencil

Procedure:

1. On phrase strips or printed text phrases, provide printed “chunks”—paragraphs or excerpts of content area, multigenre text (e.g., passages from ethnic authors, variations of problem-solving passages, or varied content texts; see Figure 4.1 for a sample format for presenting the content passages).
2. Ask students to read each phrase independently, keeping in mind they may need to read each cohesive chunk several times before it can be read seamlessly. Encourage students to work in pairs to listen to the oral reading of each content phrase.

Suggested Teacher Talk: *Does the text make sense if I pause after each word? Why or why not? How does pausing at appropriate times enhance understanding?*

3. Encourage students to self-select cohesive chunks of content text to create additional phrase strips. Have students share their phrases with the group.

FIGURE 4.1. Sample Chunk-It Format

The independent and self-assured reader demonstrates fluency, which can correlate with work completion.

The independent and self-assured reader demonstrates fluency, which can correlate with work completion.

The independent and self-assured reader demonstrates fluency, which can correlate with work completion.

The independent and self-assured reader demonstrates fluency, which can correlate with work completion.

The independent and self-assured reader demonstrates fluency, which can correlate with work completion.

Motivation/Engagement: Musical/rhythmic. Play appropriate musical excerpts, such as rap or other lyrical selections, that have words from a song or poem, and have students indicate when they hear the end of a phrase.

Slow to Flow

Purpose: To use cueing systems to read with appropriate phrasing and expression

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Slow to Flow Guide reproducible (see Appendix), sample content area text excerpts, poetry, charts, and student notebooks or three-ring binder

Procedure:

1. Provide students or student pairs with copies of the Slow to Flow Guide. Students need to maintain their content-specific selections in notebooks or in a three-ring binder.
2. Student pairs take turns reading the initial phrase and reading aloud line by line until completing the entire sentence. As the first student in the pair reads, the second student sits besides that student and reads along independently.
3. Each student silently rereads the last line of the sentence.
4. Students reverse roles and continue until all the sentences have been read.

Suggested Teacher Talk: *Try to capture several words at a time with your eyes ahead of your voice. Read a passage and think about the value of forward eye movement when reading.*

Eye-Voice Span

Eye-Voice Span in the Classroom:

Marybeth Witham, an honors chemistry and physical science teacher at a prominent high school, was amazed to see the engagement of her students when they applied the Eye-Voice Span technique with their science content text. She said that because the state performance assessments have a timing element, students not only need the content understanding but also need to have a continuous flow with their reading. Eye-Voice Span has empowered Marybeth to support her students with the ability to phrase the content text more effectively while gathering meaning from the text. The students realized the importance of being conscious of capturing words with their eyes ahead of their voices to monitor their reading process.

Purpose: To recognize and demonstrate the value of forward eye movements when reading

Multiple Intelligences: Visual/spatial, verbal/linguistic, logical/mathematical, body/kinesthetic, interpersonal

Fluency:
Phrasing

Fluency:
Phrasing

Materials: Texts, visual projection device, passage of text; Optional: Phrase Talk Strips reproducible (see Appendix)

Procedure:

1. Discuss with the class the value of peripheral vision when reading. Describe the differences among natural vision (i.e., the way our eyes naturally take in both what is directly in front of us and what is around us in our peripheral vision), peripheral vision, and tunnel vision using a piece of text from your content area. Hold up a piece of text and illustrate natural vision by pointing out that you are using your natural vision to see the page as a whole. Identify peripheral vision by reading aloud and sharing in a think-aloud what is going on with your eyes.

Suggested Teacher Talk: *Think about what your eyes are doing when you are reading. As I am reading aloud with my voice, my eyes are looking ahead—“prereading” the next few words before I say them aloud.*

2. Use a straw to demonstrate tunnel vision by looking through the straw at one word or several letters at a time. Discuss the frustration of trying to gain meaning by looking at only one word at a time.
3. Using a visual projection device, display a text passage from your content area so that all students can see it, and initiate the Eye-Voice Span technique, as described in the following steps (Blevins, 2001; Ellery, 2009). Ask the students to glance at the entire text with their natural vision. All together, begin reading aloud the text.
4. Just before you finish reading a sentence or paragraph, turn off the projector or remove the text from the projector.

Suggested Teacher Talk: *What words are in you holding in your mind, but are no longer presented for you to view?*

5. Have students demonstrate how they can still say the next few words from the passage right after the text is removed. Discuss why this happens (e.g., because students' eyes were ahead of their voices because they were using their peripheral vision).

Suggested Teacher Talk: *Try to “push” your eyes forward, ahead of your voice.*

Motivation/Engagement: *Intrapersonal.* Have students work in A/B pairs (Partner A takes the role of teacher, and Partner B takes the role of student). Partner A listens to Partner B read text and then flips the strip to model phrasing talk. Partner B responds to the talk presented on the strip. Have partners take turns sharing what was happening with their eyes as they were reading, what they noticed, or their reactions to the process.

Pausing Punctuation

Fluency:
Phrasing

Purpose: To use punctuation in sentences to support appropriate pausing and enhance meaning

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Content area texts (optional text from www.readwritethink.org); sentences on chart paper, visual projection device, or sentence strips

Procedure:

1. Demonstrate through oral reading how punctuation may cause pausing in different parts of the text, which in turn can alter the meaning of the text. Introduce Pausing Punctuation (Ellery, 2009; Petit, 2003; Strickland, Ganske, & Monroe, 2002): Read the following sentence and discuss how pausing and adding commas could change the meaning of the sentence: *The boy said the man was mad/The boy, said the man, was mad.*

2. Select several sentences from a passage from your content area material and omit the punctuation, or use the text from Martin Luther King Jr.'s "Letter From Birmingham Jail," found in the ReadWriteThink.org lesson entitled "Every Punctuation Mark Matters: A Minilesson on Semicolons."

3. Ask a volunteer to read aloud the selected sentences without pausing.

Suggested Teacher Talk: *Listen to someone read these sentences that are unpunctuated. Try to determine the meaning based on what you heard.*

4. Have students work with partners to revisit the text read, pausing and marking where the proper punctuation should go to make the text clearer and easier to read.
5. Ask pairs to share with the class where they think the punctuation should go based on their interpretation of the correct meaning of the text. Have students return to the text and compare their versions to the original text's punctuation.

Suggested Teacher Talk: *Did your punctuation choices alter the meaning of the original text?*

6. Have students practice reading the original text, paying attention to punctuation and reading accordingly.

Suggested Teacher Talk: *Describe how attending to the punctuation supports you to bring meaning to what is being read.*

Motivation/Engagement: *Logical/mathematical.* Create an organizational chart, such as a three-column chart, to demonstrate the use of punctuation. Ask the students to search content text for examples of the use of the highlighted punctuation. In one column, have them record the highlighted punctuation. In the second column, have them record the example of the punctuation being used in text. In the third column, have the students create their own sentence using the highlighted punctuation.



Fluency Strategy: Scaffolding and Rereading

Scaffolding and Rereading allow the reader to view, hear, and practice fluent reading to gain confidence as an independent reader. This support scaffolds the learning while building fluency with guidance. The *Reading at Risk* report on adolescent literacy states,

There are specific methods to improve students' automaticity so that readers can process text with minimal errors. Repeated readings, word accuracy, reading rates, and providing models through paired reading or reading aloud can improve decoding, reading rates, expressive reading, and comprehension of passages that the reader has not seen. (National Association of State Boards of Education, 2006, p. 21)

Applying the scaffolding strategy allows the person modeling reading to demonstrate proper fluency while giving the reader guidance, and more opportunities to practice fluent reading is crucial to the development of a reader. Some adolescent readers need to be motivated intrinsically through *social reading*.

As students repeat their readings, their ability to express improves, and word recognition and reading rate increase (O'Connor, White, & Swanson, 2007; Vadasy & Sanders, 2008). "Musicians, athletes, and actors also use this practice strategy to gain fluency; they rehearse the same aspect of their performance repeatedly until they gain independence and confidence" (Ellery, 2009, p. 107, emphasis added). Sharing and collaborating through scaffolding and rereading builds readers' confidence to become fluent readers.

Key Vocabulary for Scaffolding and Rereading

- Confidence: self-assurance in the ability to read text fluently
- Guidance: direction toward becoming fluent
- Rehearse: to prepare and gain confidence through repetition for a fluent reading performance
- Social Reading: engaging in conversations about the text being read

Assessment for Scaffolding and Rereading

Use the following behaviors as a guide as you assess students' abilities to scaffold and reread. Do students exhibit these behaviors never, rarely, often, or always?

- Engages in reflective conversations about reading and receives feedback
- Imitates modeled reading and self-assesses to evaluate reading
- Analyzes repetitive features

Teacher Talk: Statements, Questions, and Prompts for Scaffolding and Rereading

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the scaffolding and rereading strategies. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating	Extended Thinking
Evaluating	Strategic Thinking
Analyzing	Strategic Thinking
Applying	Skill/Concept
Understanding	Skill/Concept
Remembering	Recall

Teacher Talk

- When you get to an area in the text that does not make sense to you, propose a way to help you comprehend.
- Why do readers sometimes need to reread?
- Determine the pattern of the text. How does knowing the text structure support your reading?
- Compare your first reading with your second or third reading. What do you notice about each time you read the text again?
- Listen to the modeled reading. Demonstrate how using the same expression and pace to carry on the story or section supports your understanding of the text.
- What are you thinking about each time you reread a passage? How does hearing the passage first help you?
- What is modeled reading?

Techniques for Scaffolding and Rereading

Frontloading

Purpose: To provide preexposure of the text to increase confidence in the seamless reading of content text

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal, intrapersonal

Materials: Content-specific text at students' instructional reading level

Procedure:

1. Select short, meaningful, appropriate-level text passages aligned with the current content theme or topics. Model the process for annotating the passage(s) with slash marks or sticky notes to align with proper phrasing for fluent reading.



2. Encourage students to preview the passage silently, reflecting on vocabulary, sentence length, and punctuation. Allow appropriate time for students to rehearse the passage and self-reflect on evidence of reading fluency.

Motivation/Engagement: Logical/mathematical. Model reading the passage aloud as the students follow in the reading. Remind the students to focus on active listening, proper expressions, and pacing. Using self-reflection, students record their reactions to the reading and share their responses.

Suggested Teacher Talk: *Listen to the modeled reading of each passage. How might you use the same expression and pace as you read further in the story, section, or chapter? What do you notice as you listen to the passage read aloud or preview the text?*

Partner Reading

Fluency:
Scaffolding
and Rereading

Purpose: To give and receive support for and feedback on oral reading

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Partner Reading Bookmark (see Appendix), texts

Procedure:

1. To begin Partner Reading (Ellery, 2005; Topping, 2001), pair students as reading partners. An option is to pair students so that one is a stronger reader than the other to match higher and lower need students.
2. Use fluency scores to select partners for reading. Another way to align students' reading levels is to use the five-count rule to determine text difficulty. The student who is not reading holds up five fingers and begins to keep track of the number of errors made in a short passage read by his or her partner. Error correction rule: When the reader is unsure of a word, the partner waits four seconds and then says the word correctly, and the reader repeats the word. This is counted as an error. If partners are unable to identify the word, the word is skipped and still counted as an error.

Five-Count Guide

- 0–1 count demonstrates that the book is easy to read
 - 2–3 counts represents that the book is at the reader's interest level
 - 3–4 counts denotes that the book is at the challenge level for understanding
 - 5 count signifies frustration level and the reader should not continue reading until further assistance is given
3. Ask partners to take turns reading aloud to each other, or they may read together while supporting each other's reading throughout the duration of the text being read.
 4. Give each student a Partner Reading Bookmark, which lists the reading behaviors. Ask the more fluent reader to use the bookmark as a checklist as his or her partner reads.

Suggested Teacher Talk: *Tell your partner something you notice about yourself when you read.*

5. Partners engage in taking turns reading, rereading, and retelling the assigned passage.

Integrated Choral Reading

Fluency:
Scaffolding
and Rereading

Purpose: To view, hear, and rehearse seamless reading of content text to gain confidence as an independent reader

Multiple Intelligences: Visual/spatial, verbal/linguistic, musical/rhythmic, interpersonal

Materials: Content-specific reading text selections, song lyrics, poetry, highlighters, notebook or three-ring binder

Procedure:

1. Model Integrated Choral Reading (Ellery, 2009) using sample content text excerpts to read aloud together. Provide appropriate content passages at the students' instructional or independent reading level.
2. Encourage students to rehearse the passages aloud, striving for seamless, fluent reading.
3. Ask a fluent reader to demonstrate confidence while modeling reading an additional passage. Provide support and encouragement as students reread the passages through choral reading.
4. Students can maintain their content passages in a three-ring binder or choral reading notebook. Choral reading entries can also be used as study guides or as text resources for other fluency techniques described in this chapter.

Suggested Teacher Talk: *How does hearing the passage read aloud support you as a reader?*

5. Compare your initial reading with your second or third reading.

Suggested Teacher Talk: *What do you notice as you rehearse the passages? When you encounter an area of text that does not make sense to you, propose a way to help you comprehend.*

Motivation/Engagement: Logical/mathematical. Student pairs alternate roles; one student follows along as his or her partner reads the passage aloud. A paired reading format enhances the amount of rehearsal time provided for reading each passage and provides a social reading format for engaging in discussion of the text. Data can be maintained and added to notebooks in the form of charts or graphs to monitor reading rates on content passages. Note: More on reading rates can be found in the Pacing Strategy section in this chapter.



Fluency Strategy: Expressing

Expressing is another major component of prosody, along with phrasing. Adolescent readers are very expressive in their oral language and understand that the tone in which they make a statement can affect the meaning. When readers begin to use expression as a natural fluency strategy they find the same concept to be true for their reading. The *prosodic functions* (e.g., pitch, stress, tone) and forms are valuable for the reader to bring meaning, life, and purpose to what is being read. When students apply the expressing strategy to their reading, they are able to convey the text's intended mood and proper meaning. Lack of this strategy leaves the reader sounding monotone and the reading sounding labored. An absence of the expressing strategy also causes many readers to lose their interest and motivation and makes reading feel like a task that is incomprehensible. "Many times concepts appear in ambiguous, confusing language that students can read but do not understand" (Kinniburgh & Shaw, 2007, p. 16). The expressing strategy can encourage adolescent readers to consider learning to read fluently as a meaning-making process. According to Rasinski and Padak (2005), "When students are asked to perform for others, they have a natural inclination and desire to practice the passage to the point where they can read it accurately, with appropriate rate, and especially with meaningful expression and phrasing" (p. 26). The ultimate product is a fluent reader who comprehends what he or she reads and enjoys reading as they become lifelong fluent readers.

Key Vocabulary for Expressing

- Pitch: the tonal height of sound in speech
- Prosodic Function: indication of syntax and attitude from appropriate use of stress, pitch, and tone when reading
- Purpose: the reason or intent for a specific prosodic function being used
- Stress: pronunciation or placement of the accent on spoken words
- Tone: a particular quality of sound created through pitch, modulation, and intonation of the voice



Assessment for Expressing

Use the following behaviors as a guide as you assess students' abilities to express. Do students exhibit these behaviors never, rarely, often, or always?

- Identifies prosodic functions
- Demonstrates how text comes to life with voice and body language
- Conveys the text's mood and meaning

Teacher Talk: Statements, Questions, and Prompts for Expressing

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the expressing strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating
Extended Thinking

Evaluating
Strategic Thinking

Analyzing
Strategic Thinking

Applying
Skill/Concept

Understanding
Skill/Concept

Remembering
Recall

Teacher Talk

- What message can the volume of your voice send to the audience? How can you modify your voice to sound like you are holding a conversation?
 - What feeling do you think the author wanted the character to have in this part? How do you know what the author wanted?
 - Did you use the proper tone to convey the meaning? Why or why not?
 - How did the tone of your voice set the mood for your statement?
 - How would the character say that line?
 - Change your voice to sound like the character you are portraying.
 - Try to make your reading sound as real as it can be.
 - Explain how you can make your reading sound more exciting.
-
- What does a period (or other punctuation mark) mean?
 - What does your voice do when you read a sentence that ends with a question mark?

Techniques for Expressing



Interpretative Dialogue

Purpose: To apply expressions to portray character traits in text

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Content area text excerpts rich in historical, humorous, fictional, or real-world dialogue

Procedure:

1. Model reading sample dialogue so students have opportunities to hear how to read with expression and how to modify tone and expression for different characters and character

traits. (You might choose sample dialogue from famous speeches, literary works, narratives, and drama.)

2. Ask students to read and rehearse a section of dialogue from content-specific text and craft their own interpretations of how to portray the characters' traits and voices. Encourage students to discuss in small groups their interpretations of the characters and reach a consensus of the analysis of each character. This ensures that meaning is not misconstrued.
3. In groups with established group member character roles, have each student perform the dialogue through the lens of each character, reading aloud with expression.
Suggested Teacher Talk: *Did you use the proper tone to convey the meaning? Why or why not? How can you modify your voice to sound like you are holding a conversation?*
4. After the read-alouds, students are encouraged to read the dialogue selections to each other.

Motivation/Engagement: *Intrapersonal.* Encourage students to self-select additional content area texts that are rich in dialogue and relevant to the current theme or topic of study. After each reading performance, invite the listening audience to reflect on the relationship between the appropriate tone and expression in the dialogue and making meaning of the text.

Suggested Teacher Talk: *What feeling do you think the author wanted the character to present? How might we interpret the intended meaning and attitude in text?*

Totally Tonality

Fluency:
Expressing

Purpose: To reflect on and adjust the appropriate tone of voice needed to communicate the intended meaning and attitude in the text.

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic

Materials: Expression Cards (see Appendix), content-specific text at students' instructional reading level, note cards, chart paper, visual projection device

Procedure:

1. Ask students to brainstorm words or phrases that describe varied tones that readers use to communicate the author's intended purpose, attitude, or emotion in the text (e.g., sarcastic, humorous, ironic, demonstrative, serious). Point out how the tone of voice reflects the attitude and emotion communicated in the reading using this Totally Tonality technique (Ellery, 2009). Capture key ideas on chart paper, note cards, or the whiteboard to revisit and modify during and after reading.
2. Discuss how the reader's tone of voice can change the communicated meaning of the text. For example, when a phrase such as *very funny* is communicated in a sarcastic tone of voice, it's understood that the speaker is actually saying something is *not* funny.

3. On note cards, write some content-specific phrases that the students can read and write different tones of voice they might use. The teacher may want to include some of the words or phases from the earlier brainstorming activity.

Suggested Teacher Talk: *Modify your voice to sound like the character you are portraying. How did the tone of your voice establish the attitude for your statement?*

4. Encourage students to read appropriate content-specific text selections using a chosen tone. Guide students in noting how the pitch and stress in their voice is used to convey the intended attitude.
5. Discuss the reasons students selected a certain tone when reading each passage.
Suggested Teacher Talk: *What message can the volume of your voice communicate to the audience? What attitude do you feel the author intended to communicate in each passage? How might you know the attitude the author intended?*

Motivation/Engagement: *Interpersonal.* Use the Expression Cards at a writing area. Have the students select several Expression Cards to incorporate into their creative writing. They can write the dialogue of the characters to align with the expressions chosen to convey the proper meaning.

Radio Reading

Fluency:
Expressing

Purpose: To express dialogue in text through performance-based learning

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Scripted texts; Optional: microphone, radio announcement recordings

Procedure:

1. Assign a content area passage to a group of students to practice reading prior to performing it as a radio announcer for Radio Reading (Ellery, 2009; Greene, 1979; Opitz & Rasinski, 2008; Searfoss, 1975). Only the teacher and the readers have a copy of the scripted text. Those that are participating as the audience (the other students in the class) for the radio show will not have the script to preview. The readers can rehearse at school, home, or both. It may be helpful to have students listen to expressive radio announcements as models for Radio Reading.
2. Have the student radio announcer prepare open-ended questions and statements about the selection. This will allow for dialogue with the audience after the performance.
3. When the radio show is ready to air, hold up a red sign to signal the beginning of the show. The student radio announcer reads the selection (using a microphone if one is available) expressively and meaningfully to capture the listening audience. It is the radio announcer's responsibility to render a clear, comprehensible message.

Suggested Teacher Talk: *How can you make your reading sound more exciting?*

4. Invite the audience into a discussion about the selection using the questions and statements the student radio announcer provides. Discussing the questions and statements requires the listening audience to demonstrate if they derived meaning from the reading.
Suggested Teacher Talk: *What message can the volume of your voice send to the audience?*

Fluency:
Expressing

Readers Theatre

Purpose: To explore expressive language use through oral reading of scripts

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Texts, scripts; Optional: microphones

Procedure:

1. Provide students with a dialogue-rich script of a story derived from text that may be prepared for Readers Theatre (Hoyt, 1992; Shepard, 1994; Sloyer, 1982). You might select a text right from a story, have students generate a script based on content text, or provide a script you created. There are numerous websites available from which you can download a script you created. The students need to have a clear understanding of the types of adjustments (e.g., punctuation, dialogue, Readers Theatre script) that were made to change the text into a play.
2. Assign the students roles in the play. Highlight the text for each reader's role on a separate copy of the script. Give students the option to read the original text and then the newly scripted version to help them compare and contrast the dramatization that they will need to perform the Readers Theatre. These selections should contain interesting characters, appealing themes, and stimulating plots that enhance language.
3. Discuss with students the meaning of the text and the importance of the use of language.
Suggested Teacher Talk: *How would the character say that line? Change your voice to sound like the character you are portraying. Try to make your reading sound as real as it can be.*
4. Allow students many opportunities to rehearse their parts before "going public" by reading aloud. Encourage reading with expression. Remind them that they do not have to memorize their parts prior to the performance. They will be holding the script and reading directly from the text. It is each student's responsibility to bring the character to life with prosodic features.
5. After several rehearsals, have students, individually or in small groups, perform a dramatized presentation, expressively reading their parts in front of a live audience. Following the performance, give feedback on how the students portrayed the characters with their expressions.

Suggested Teacher Talk: *Did you use the proper tone to convey the meaning? Why or why not? How did the tone of your voice set the mood for your statement?*

Motivation/Engagement: *Logical/mathematical.* Invite students to adapt a piece of literature into a script for Readers Theatre. Have them create guidelines or criteria for reading expressively, which the group can use while preparing for their Readers Theatre. Criteria might include the following: work cooperatively as group prepares and rehearses, speak clearly and use an appropriate volume, read the text accurately and with proper expressions.

Fluency Strategy: Pacing



Appropriate pacing is vital to a fluent reader's ability to bring meaning to the text. Pacing includes the reader's *rate*, *flexibility* with the text to *alter* the pace as needed to comprehend, and the reader's *automaticity* while encountering words. "Show me a thoughtful reader who adjusts his pace according to prior knowledge and text structure, and I'll show you a real reader" (Marcell, 2010, p. 1). When readers slow down to attend to unfamiliar words, they lose meaning of what has already been read, and their comprehension decreases (O'Connor et al., 2007; Rasinski, 2000; Vadasy & Sanders, 2008). Recent practices have encouraged readers to "speed" read text to increase their words-correct-per-minute rate. However, in order for proper pacing to enhance proficient reading, it is important to avoid reading too fast (being a word caller) and instead to read at a pace that *flows* as meaning is formulated. Text that is at the student's independent or instructional level is needed when applying the pacing strategy.

Key Vocabulary for Pacing

- Alter: to adjust pacing to bring meaning to the text
- Automaticity: instant word recognition with accuracy and flow
- Flexibility: ability to adapt rate to determine meaning
- Flow: to move consistently, smoothly, and freely from word to word
- Rate: speed, tempo, or time in which words are read automatically
- Speed: number of words read correctly per minute (WCPM)

Assessment for Pacing

Use the following behaviors as a guide as you assess students' abilities to pace. Do students exhibit these behaviors never, rarely, often, or always?

- Distinguishes appropriate rhythm in reading
- Adjusts reading rate
- Tracks and observes the flow of reading



Teacher Talk: Statements, Questions, and Prompts for Pacing

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the pacing strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking	Teacher Talk
Creating	<ul style="list-style-type: none"> How does the speed at which you are reading make a difference for you?
Extended Thinking	<ul style="list-style-type: none"> Formulate a plan to adapt your pacing as you read.
Evaluating	<ul style="list-style-type: none"> What criteria do you use to determine if you are pacing appropriately?
Strategic Thinking	<ul style="list-style-type: none"> How effective is your rate of reading?
Analyzing	<ul style="list-style-type: none"> Listen to these sentences being read aloud and track the pace of the reading in your copy of the text. Is it easy or difficult for you to keep up with the pace being modeled—that is, with the tempo?
Strategic Thinking	<ul style="list-style-type: none"> Try to follow the light I'm shining on the text as I read and maintain the same pace to increase your rate.
Applying	<ul style="list-style-type: none"> Explain how hearing yourself read and tracking how long it takes you to read helps you to pace better.
Skill/Concept	<ul style="list-style-type: none"> How does increasing your rate help you?
Understanding	<ul style="list-style-type: none"> What is your reading rate?
Skill/Concept	
Remembering	
Recall	



Techniques for Pacing

Rate/Record/Reflect

Fluency:
Pacing

Purpose: To self-monitor flow of reading

Multiple Intelligences: Visual/spatial, verbal/linguistic

Materials: Methods for Determining Developmental Reading Levels (see Appendix), texts, photocopies of text, stopwatch, audio recorder (e.g., iPhone, voice recorder), graph paper

Procedure:

1. **Rate:** Have each student read aloud a text at his or her developmental reading level while you or a volunteer time the student with a stopwatch. On graph paper, chart the time it took the student to read the text (Allington, 2001; Ellery, 2009). Use Table 4.1 to determine

TABLE 4.1. Reading Performance Levels and Accuracy Rate

Reading Performance Levels	Accuracy Rate
Independent	95–100% (able to read without assistance)
Instructional	90–94% (able to read with some assistance)
Frustration	89% and below (unable to read even with assistance)
<i>Note. Word accuracy rate = number of words read – number of errors ÷ number of words read.</i>	

TABLE 4.2. Oral Reading Fluency Rate, Grades 5–12, Words Correct Per Minute (WCPM)

Grade	Percentile	Fall WCPM	Winter WCPM	Spring WCPM
5	90	169	184	194
	50	117	131	137
	10	61	74	83
	90	177	195	204
	50	127	140	150
	10	68	82	93
	90	180	192	202
	50	128	136	150
	10	79	88	98
6	90	185	199	204
	50	133	146	151
	10	77	84	97
7	(silent)	180	190	214
	(silent)	190	214	224
	(silent)	214	224	237
	(silent)	224	237	250
10	(silent)	190	214	224
11	(silent)	214	224	237
12	(silent)	224	237	250

Note. Words correct per minute = number of words in the passage ÷ reading time (in seconds) × 60.

Adapted from an electronic aggregation using AIMSweb Norms 2003–2009; Hasbrouck & Tindal, 2006; Johns & Berglund, 2006.

^aThe oral reading rates are listed only to eighth grade. Typically, oral reading rate does not increase beyond eighth grade. Therefore, the rates listed for grades 9–12 are for silent reading and percentiles are not included.

the student's accuracy rate and Table 4.2 to find the reading rate that correlates with a grade level.

Suggested Teacher Talk: *Explain how increasing your rate will help your reading.*

2. **Record:** Have each student record the same reading on an audio recorder and time his or her reading. The student should play the recording while following along using a photocopied version of the text. Have the student note miscues, which represent a

departure from the text, on the photocopy and score their errors. Reflecting on miscue analysis allows the reader to examine the type of miscues (e.g., omissions, mispronunciations, repetition). Reading errors are specific miscues that are scored that alter the meaning of the text (e.g. insertions, substitutions). Chart the time for the second reading on graph paper.

Suggested Teacher Talk: *How does hearing yourself read and tracking how long it takes you to read help you to pace better?*

3. **Reflect:** Ask the students to compare their reading times and continue the previous steps as needed. Share with students that they should expect an increase in their reading rate as they are rereading the passage.

Motivation/Engagement: *Intrapersonal.* Have students reflect on and self-assess the reading and the graphed results. Repeat the process two more times. Have students create goals for themselves as they note their progress. Additional fluency assessments can be used to determine not only their reading rate but also reading level. The following are a few examples of fluency assessments for secondary readers:

- Qualitative Reading Inventory-4 (Leslie & Caldwell, 2005)
- 3-Minute Reading Assessments: *Word Recognition, Fluency, and Comprehension, Grades 5–8* (Rasinski & Padak, 2005)
- Developmental Reading Assessment, 4–8, second edition (Beaver & Carter, 2003)

Beam Reading

Fluency:
Pacing

Purpose: To use an instrument to visually guide reading and gauge flow

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Texts, laser-beam pen or flashlight

Procedure:

1. Use a laser-beam pen or flashlight to shine on words in a selected text. Move the light along the words at a steady pace. Students can also have their own flashlight for individual reading.

Suggested Teacher Talk: *Try to keep up with the light to increase your rate.*

2. Encourage students to follow along with the light as they read aloud. Increase the rate at which the light shines on the words with each rereading of the text.
3. Have students practice this technique with partners, taking turns beaming light on the sentences and reading silently or aloud at the pace of the light.

Suggested Teacher Talk: *Is it easy or hard for you to keep up with the pace being modeled? How does the speed at which you are reading make a difference for you? Formulate a plan to adapt your pacing as you read.*

Sprints and Stamina

Sprints and Stamina in the Classroom:

Mandy Kersey, a high school reading teacher, uses Sprints and Stamina as a technique with every ability range, from the struggling special needs student or ESOL student who is practicing basic reading skills to the gifted student who is getting prepared for Advanced Placement exams or college entrance exams. Mandy shares with her students the terms *sprints* and *stamina* as used by runners: Sprints help them run faster and increase stamina, or endurance, in their track training. She explains that students are going to use a similar technique in their classroom for fluency training. She lets her students know that just as runners must use specific practices to increase their ability levels, good readers must also train their brains with effective reading strategies.

Purpose: To be flexible with reading rate to enhance meaning and endurance

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal, intrapersonal

Materials: Clipboard, whistle, content area leveled text, paper; Optional: stopwatch or timer

Procedure:

1. Distribute text to each student for reading. Explain to the students that the sprint concept relates to running a short distance at a fast pace. The goal of sprints is to get the students to practice reading as quickly as they can in a short time period. The range of time can be one-, two-, or three-minute increments. The reading is timed. Students will read as quickly as they can, then record their word correct per minute (WCPM) rate. The goal is to increase speed while maintaining a certain level of accuracy in comprehension. (The accuracy level can be moved based on specific ability, but should be at least 70%).
2. Demonstrate the sprint concept applied to reading by asking the students to use several strategies that support pacing their reading without sacrificing meaning of content.

Variations of sprints:

- **Relay Sprints:** Students are in a group of four. They read a short passage, and when one minute is up, they must pass the paper to the next person. At the end of four minutes, they discuss the four passages as a group and work together to answer a list of questions about the passage without looking at the passage.
- **Interval Sprints:** Students read for one minute, then for two minutes, then for three, then for four (and the time can go back down). At the end of each interval they have a brief rest to answer the questions. They then compare their WCPM and accuracy at each level.
- **Who/What/When/Where/Why Sprints:** Students read the passage as before, but instead of having predesigned questions, the students must simply answer Who/What/When/Where/Why about the passage to show they comprehend the meaning.

Fluency:
Pacing

- **Vocabulary/Review Sprints:** Create a template with the vocabulary, terms, or characters that the students need to study or remember. Make several different versions of the template, with the terms in a different order on each version. Time the students for one minute as they read as many of the terms as they can before time is called. After time is called, students rotate papers so that they have a new sheet with the terms in a different order. Repeat two to three times to help study and increase reading speed.
 - **Oral Sprints:** Students read a passage aloud in one minute to see how many words they can read verbally. The teacher circles on his or her own paper any mistakes that are made during the reading and documents how the student read. Questions of comprehension immediately are given verbally.
3. Explain to the students the concept of stamina by relating it to running a long-distance race. The goal of stamina is to help students endure longer reading passages and be able to recall information from longer texts, while still reading at a certain pace. Passages for stamina need to be at least 500 to 750 words and can be up to 2,500 words. The number of words is directly tied to how strong a reader the student is, and it should increase over time.
4. Model several stamina ideas applied to reading by asking the students to use several strategies that support pacing reading without sacrificing meaning of content.

Variations of stamina:

- **ACT Preparation:** Choose passages that are 750 words and create 10 questions about them. The passages must include one relating to prose fiction, one to social science, one to the humanities, and one to natural science. Students will need to be able to complete each passage and respond to the 10 questions in less than 8½ minutes, because that is how long they will have on the actual ACT test.
- **Novel Stamina:** This can be done in class or at home. Students time themselves reading a chapter in a novel that is at an appropriate reading level. They can count four lines and then create an average based on the total number of lines. This may help them get through a book that they are having a hard time reading.
- **Low-Level Stamina:** These are shorter passages at a reading level one grade level below the student's actual ability. This is done to increase confidence in reading and to help them increase flow.
- **Prepared Stamina:** Students preview the passage and have the opportunity to skim the passage and look for any unfamiliar or unknown words before reading. Students may use several resources to help them (e.g., dictionary, translation dictionary) before beginning the passage. Students are given a predetermined amount of preparation time as needed. They will then be timed and tested as usual.

Commercial Programs

Purpose: To practice smooth reading using technology and other resources

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic

Materials: Texts, computer, computer-based program

Procedure:

1. Select an appropriate computer program (see the following list). The programs listed are supplemental and may be used for immediate, intense intervention in several of the areas of reading noted in Chapters 3–6.
2. Incorporate one of the following computer-based fluency programs into your comprehensive literacy-based classroom.

Suggested Teacher Talk: *Does the computer program help you pace yourself as a reader? Why or why not? How does the speed to which you are reading make a difference for you?*

- **Great Leaps Reading Program** (K–12; Campbell & Mercer, 1998) is a tutorial program divided into three major areas: (1) phonics, which concentrates on developing and mastering essential sight–sound relationships or sound-awareness skills, (2) sight phrasing, which supports students in mastering sight words while developing and improving focusing skills, and (3) reading fluency, which provides age-appropriate stories specifically designed to build reading fluency, reading motivation, and proper intonation.
- **Inside: Language, Literacy, and Content** (4–8; National Geographic School Publishing, 2008) provides daily practice in routines for developing reading accuracy, intonation, phrasing, expression, and rate.
- **QuickReads** (Hiebert, 2005) is composed of high-interest nonfiction texts at the second- through sixth-grade levels. QuickReads develops automaticity by using text that is composed of 98% high-frequency and decodable words. The program combines leveled texts with speech-recognition technology. The program provides instant feedback and corrects errors by prompting repeated pronunciation of unknown words.
- **REWARDS** (Reading Excellence Word Attack and Rate Development Strategies; Archer, Gleason, & Vachon, 2000) is intended for intermediate to secondary students. It supports students in decoding and reading multisyllabic words in context, increasing reading accuracy and fluency, and improving comprehension. The first 12 lessons support the skills necessary to learn multisyllabic words (blending syllables and pronunciations of affixes and vowel combinations). The last 7 lessons focus on helping readers use fast and accurate decoding to increase reading rate.



Fluency Strategy: Wide Reading

Students need an opportunity to read a variety of genres and structures as they discover the joy of wide reading to contribute to improved fluency. Wide reading stems from a need for a variety of literary genres to increase *motivation*, fluency, and comprehension. The more exposure readers have to text, the more opportunities will arise for them to engage with a text that motivates them to read. The practices of providing students with access to appropriate texts as well as opportunities to read texts that are engaging and age appropriate are essential for effective fluency instruction (Tatum, 2008). Wide reading exposes the readers to a plethora of words, increasing *word consciousness* and accuracy for fluency development. Content texts often contain specialized terms that may be unfamiliar to readers and therefore slow their reading. Using the strategy of wide reading draws students' attention to new vocabulary as they become aware of the precise word usage. Research by Nathan and Stanovich (1991) indicates that

[if students are] to become fluent readers, they need to read a lot. Our job as educators is to see to it that children want to read, that they seek new knowledge via the written word and derive satisfaction and joy from the reading process. (p. 179)

Key Vocabulary for Wide Reading

- Discover: to find interest in text
- Engage: to actively attend to text
- Motivation: the desire, passion, and reason to read
- Variety of Genres: different categories of types of text
- Word Consciousness: awareness of words being used



Assessment for Wide Reading

Use the following behaviors as a guide as you assess students' abilities to employ wide reading techniques. Do students exhibit these behaviors never, rarely, often, or always?

- Chooses to read independently
- Self-selects books based on reading level
- Determines purpose for reading

Teacher Talk: Statements, Questions, and Prompts for Wide Reading

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the wide reading strategy. Try using some of these statements, questions, and

prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating
Extended Thinking

Evaluating
Strategic Thinking

Analyzing
Strategic Thinking

Applying
Skill/Concept

Understanding
Skill/Concept

Remembering
Recall

Teacher Talk

- Create an organizational chart or guide of traits that you look for when selecting a book. How do you determine if the text is aligned with your reading level?
- How do you feel when you are reading a book that is at your level?
- Why is it important to independently read books at your appropriate level?
- Distinguish the characteristics of a book that is considered a challenge for you, compared with a book that is more in your comfort zone.
- Try to select a book that interests you and is in your comfort zone.
- Record in your reading logs the variety of genres you are reading.
- What are signs that a book is too easy or too difficult for you?
- Identify several genres you are reading.

Techniques for Wide Reading

Volume Reading

Purpose: To be exposed to a variety of reading for extensive independent reading

Multiple Intelligences: Visual/spatial, verbal/linguistic, intrapersonal

Materials: Pass the Book Reflection Guide reproducible (see Appendix), multigenre content area leveled texts (e.g., varied genre formats of relevant trade books, reference materials, Web resources, newspapers, magazines), notebooks or three-ring binders

Procedure:

1. Select relevant, multigenre texts that support and enhance the current content theme or topic of study. Students should have easy, frequent access to these resources to encourage extensive engagement with level-appropriate texts (e.g., comic books, trade books, fiction, nonfiction).
2. Engage students in a "pass-the-book" process to pique their interest and desire to read. Arrange the classroom in a small-group environment and place a sampling of the selected text resources at each group table. Ensure that a diverse sampling of genres is included for each group.



Fluency:
Wide Reading

- Suggested Teacher Talk: *Try to select text that interests you and is at your comfort zone. Record the variety of genres you are reading.*
3. Model the process for digging into a text resource by determining the genre, reading the book jacket, previewing the first few pages of the text, and determining the match between the text and the reader.
 4. Provide each student with a Pass the Book Reflection Guide for listing the titles and authors of books they would want to read. The Pass the Book Reflection Guide can be maintained in a journal or notebook for accountability and self-regulating of the reading volume. Students should be reminded to refer to their journals for new titles and additional reading.
 5. Students move from table to table to peruse the book selections, noting on their Pass the Book Reflection Guide titles and authors of books of interest. Depending on class size and room arrangement, an option is for students to work in small groups. In this case, provide six to eight books for each group to explore. After exploring the available books (for approximately 8–10 minutes) groups can pass the books to another group and repeat the process with a different sampling of books.
 6. Periodically revisit the pass-the-book process to encourage students to update and increase their volume of reading selections and share both new titles and recently read selections with their group.

Suggested Teacher Talk: *What are indicators or signs that a book is too easy or too difficult for you? Why is important to independently read books at your appropriate level?*

Motivation/Engagement: *Interpersonal.* Market the books by periodically featuring selected content text resources. Model how to highlight books and resources by reading a dramatic text excerpt, sharing illustrations, or doing both. Students can replicate this process of marketing books and titles they found particularly interesting.

Scaffolding

Fluency:
Wide Reading

Purpose: To use support when aligning reading level with appropriate text difficulty

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Methods for Determining Developmental Reading Levels (see Appendix), variety of leveled texts (e.g., content book excerpts, journal articles)

Procedure:

1. Select a group of students to work in a small-group setting at or slightly above their independent reading levels. Group students who have similar needs or interests. Use the Methods for Determining Developmental Reading Levels reproducible to determine students' levels for grouping.

2. Choose texts that are accessible on the basis of appropriate grammar, rhetorical structure, vocabulary, and background knowledge of students and texts that are engaging and interesting.
 3. Model how to select a book or text that is just the right match for the student's level. Discuss why it is important to evaluate reading material to determine if it is at the appropriate level.
- Suggested Teacher Talk: *What are signs that a book is too easy or too difficult for you?*
4. Model the use of a reading strategy with the text (e.g., determining importance) and discuss why the strategy is appropriate for understanding the text.
 5. Have students read a selection from the text independently, practicing previously introduced teaching points for the strategy. Return to the text together and analyze the application of the teaching point. Students can reread text for fluency after scaffolding to increase independent wide reading.

Literary Tours

Fluency:
Wide Reading

Purpose: To pique interest and motivation for reading a wide variety of content area text resources

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal, intrapersonal, naturalist/environmentalist

Materials: Multigenre, appropriate content area text resources (e.g., websites, magazines, newspapers, books) and other resources aligned with the current theme or topic, chart paper, whiteboard, or visual projection device

Procedure:

1. Encourage students to share varied locations (real-world or historical) relevant to the current content area theme or topic that they would like to tour virtually. Capture students' ideas on chart paper, a whiteboard, or a visual projection device.
2. Support students in brainstorming what they might see, hear, and discover on the virtual tour of their chosen destination (e.g., Independence Hall and Liberty Bell Center in Philadelphia, Pennsylvania: A visitor may see the Liberty Bell and crowds of visitors and hear the voice of a curator or tour guide. A visitor may discover the historical significance of the signing of the Declaration of Independence.).
3. Students brainstorm and identify multigenre print and online resources that can be used as references to extend understanding of their destination.

Suggested Teacher Talk: *Identify several multigenre text resources that you might read to extend your understanding as you tour your destination. What essential questions would you want answered during your literary tour?*

- Select content area text resources relevant to the current theme or topic. Encourage students to seek additional reading resources to extend their exploration.
- Guide students to transfer the tour concept to one or more of the nonfiction text resources they will be reading. Students tour their location through reading.

Suggested Teacher Talk: *Describe some of the key ideas as you are reading.*

Content Read-Aloud

Fluency:
Wide Reading

Purpose: To absorb key vocabulary through modeling of expressive, enthusiastic reading as well as to experience the pleasure of reading

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Level-appropriate, content-specific text, note cards

Procedure:

- Select multigenre, content-specific text resources (e.g., newspaper and magazine articles, textbook or literature excerpts, children's books) that you find interesting and read them aloud to students. Encourage students to focus on the vivid expression and tonality as you read and to absorb the content vocabulary from the read-aloud (Ellery, 2009; Kane, 2007).
- Instruct students to discuss with a partner the interesting words and phrases, tone, and expression heard during the read-aloud.

Suggested Teacher Talk: *How does the expression, tone, and pace of the oral reading support understanding? Why are our featured vocabulary words interesting to you?*

- Make the text accessible in the classroom for students to revisit and read independently. Maintain a list or chart of content text titles read aloud in class. Focus on providing read-aloud resources from a variety of genres.

Motivation/Engagement: *Intrapersonal.* Provide note cards for students to capture and record interesting vocabulary after the teacher has finished reading. This academic vocabulary can be used as seeds for discussion as well as for activating background knowledge of the topic or theme.

Chapter 5

Vocabulary: Making Meaningful Connections



Associating with Active Analogies



Contextualizing with Context Complex Clues



Associating with Academic Word Wall

The necessity for effective vocabulary instruction becomes increasingly evident in intermediate and secondary classrooms as readers engage with the specialized vocabulary presented in content area text. Secondary readers often struggle with the academic language (Marzano & Pickering, 2005) and require many opportunities for developing rich, expressive (speaking and writing), receptive (listening and reading), and technical (content area related) vocabulary. A report by the National Institute for Literacy (2007) confirms the complexity of understanding content area literacy for adolescent learners. A growing research base evinces the alignment of a rich vocabulary and a student's ability to make connections in reading. The intersection between vocabulary knowledge and comprehension is extended by presenting vocabulary as influencing comprehension and

- Googlewonderwheel.com—a graphical representation of related search items
- Visuwords.com—a site that creates a word map of connections and word families
- Eyeplorer.com—a colorful wheel that arranges topics by categories
- Shahi (blachan.com/shahi/)—a visual dictionary that combines wiktionary.org content with flickr.com images

3. Have students select three search engines and try out the same topical search in each.

Suggested Teacher Talk: *Describe which search engine provided the best response to your search and why. What keywords did you use to narrow your search?*

4. Students record in the vocabulary journal the keyword or phrase that supported their connection to the necessary information.

Resource Course

Vocabulary: Referencing

Purpose: To effectively use the glossary and thesaurus to analyze content vocabulary

Multiple Intelligences: Verbal/linguistic, interpersonal

Materials: Content text with glossary, text selection with key vocabulary emphasized typographically (e.g., bold, italics, color), dictionary, thesaurus, sticky notes, markers, student notebooks or journals

Procedure:

1. Prior to reading a content text, students can initiate their journey by skimming the selection and noting the text features that are used for emphasizing important vocabulary (e.g., bold print, italics, different colors). The emphasized terms often align with the word selections in the text glossary.
2. For the next steps on their journey, students work independently to select terms that are emphasized in the content text selection and brainstorm possible definitions, synonyms, and antonyms for each word. Students share their chosen vocabulary definition predictions with a partner.
3. Working in pairs, students confirm or modify their predictions through analysis of the words in a dictionary, glossary, or thesaurus. Students note the definitions (from the glossary or dictionary), synonyms, and antonyms on 3-by-5-inch cards or in vocabulary journals or notebooks. When applicable, encourage students to include a visual representation to enhance their understanding.
4. Wrap up the journey by leading students in a whole-group discussion about how the dictionary, glossary, and thesaurus support student learning and vocabulary understanding.

Suggested Teacher Talk: *How might these resource tools support the writing process?*

Motivation/Engagement: Visual/spatial. Encourage students to use online dictionary and thesaurus resources (e.g., www.dictionary.com, www.thesaurus.com, dictionary.cambridge.org). Use the Word-Net Wheel technique (see the Associating strategy in this chapter) as a tool for student application in organizing and displaying their dictionary or glossary definitions, synonyms, and antonyms.

Defining Moment

Purpose: To explore the dictionary features to sum up the meaning of a word

Multiple Intelligences: Verbal/linguistic, bodily/kinesthetic, interpersonal, intrapersonal

Materials: Defining Moment Feature Cards reproducible (see Appendix), Four Corners reproducible (see Appendix), dictionaries, technological support (e.g., online dictionary sources)

Procedure:

1. Preview content text and select essential academic vocabulary for students to explore for a deeper understanding.
2. Copy and distribute the Defining Moment Feature Cards (pronunciation, syllabication, parts of speech, etymology [history of the word], definitions, and synonyms).
3. Model the process for Defining Moment using a sample content word. Using a print or online dictionary, locate the sample word and read aloud each of the dictionary resource features noted on the Defining Moment Feature Cards. Select four of the cards as focus areas to create a Four Corners model (see the Visualizing strategy in this chapter) on notebook paper or chart paper. Use a think-aloud to demonstrate how each feature provides the reader with a deeper understanding of the word.
4. Initially, assign each group one of the focus content vocabulary words. In table groups of four or five, students collaborate to distribute the Defining Moment Feature Cards (there are six cards, so some group members may need to present two cards to their group), and locate their focus word using a print or online dictionary resource. Students use the information on their assigned card(s) as a guide for sharing their word feature(s) with the group.
5. Groups will need to identify four of the Defining Moment Feature Cards that would support understanding of the focus vocabulary to create their Four Corners model. Encourage students to be creative by using diagrams, models, or illustrations to share their focus vocabulary term.
6. Each group presents their vocabulary word to the whole class. Display the groups' work in the classroom during the theme or unit of study to revisit key vocabulary.
7. Guide students in a reflective discussion on how the multiple features presented in a print or online dictionary support readers in extending their understanding beyond a definition.

Motivation/Engagement: *Visual/spatial.* Encourage students to self-select their Defining Moment vocabulary in the text. Deepen word associations by having students craft an acrostic poem using the letters from their word. An acrostic poem takes a word and uses each of its letters as the first letter of a line in the poem (see www.readwritethink.org, search on keywords “acrostic poem” for a selection of lessons).

Comprehension: Frontloading and Downloading



Activating and Connecting with **Read and Say**



Determining Importance with **Highlighting the Highs**



Inquiring and Inferring with **Ripple Effect**

Effective comprehension instruction supports learners in becoming purposeful and reflective readers who are in control of their own reading comprehension. According to Brassell and Rasinski (2008), “Comprehension occurs when a reader is able to act on, respond to, or transform the information that is present in written text in ways that it demonstrates understanding” (p. 18). However, the cognitive process of comprehension often eludes many secondary readers. In addition, educators may find comprehension instruction to be a mystery (Gill, 2008; Lenski & Lewis, 2008; Onofrey & Theurer, 2007).

Frontloading comprehension includes assessing, activating, and building a student’s conceptual or procedural knowledge or both, which are necessary to successfully comprehend content text (Smith & Wilhelm, 2002). Before students begin reading, teachers

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set the stage for learning by motivating, setting purposes, and monitoring their students for the understanding of new content and use of new procedures or reading strategies.

"Comprehension is contingent on the ability to draw upon your previous knowledge base to meet the author's expectations; so that you can understand what the author assumes will be new knowledge to most readers" (Buehl, 2009a, p. 15).

Comprehension strategies that are planned consciously, taught explicitly, and founded on motivating and engaging instruction may support students in actively using a repertoire of strategies (Caskey, 2008). Lapp and Fisher (2009) state, "The goal is to produce readers who can automatically deploy the cognitive strategies" (p. 4). Strategic readers "download" content information systematically for long-term retention and understanding. Downloading comprehension strategies focus on multiple exposures to text, critical thinking, determining importance, summarizing, and synthesizing. Comprehension strategies support students in transferring and transforming content learning into meaning.

The frontloading and downloading comprehension strategies and corresponding techniques detailed in this chapter are designed as a framework for teachers to use to support students in securing background knowledge and clarifying the purpose for a reading task. To effectively use the comprehension strategies and techniques presented in this chapter, ample time should be allotted for teacher modeling, student engagement, and scaffolding of learning. This goal is to structure instruction to support independent application and student ownership of learning.

Teachers can use the Motivation/Engagement section within many techniques as an additional means of motivating the whole learner and creating 21st-century secondary learners (refer to Chapter 1 for a description of the whole learner and to Figure 1.1 for an illustration of the composition of a 21st-century secondary learner). The Motivation/Engagement section allows for differentiation within the technique as needed to meet the needs of all learners. This section identifies and uses a multiple intelligence other than those that are highlighted in the main procedure of the technique.

Educators should use these comprehension strategies and techniques within the lesson planning and instructional process. However, it is essential to understand that these strategies and techniques are multifaceted and can be interchangeable within the components of lesson planning (before, during, and after instruction). The comprehension techniques support secondary learners to sustain independence as readers and acquire the reading strategies.

The following are the strategies and techniques in this chapter:

- Previewing: Text Traits, Constructing Structure, Skim and Scan, Implanting Vocabulary
- Activating and Connecting: Read and Say, Text/Concept Connections, Two-Column Entries
- Predicting: Initial Sentences, Passage/Concept Impressions, Prediction Boxes, Anticipation/Reaction Guide

- Inquiring and Inferring: Reflect on Questions, Authentic Questions (3Rs), Text Inquiry, Save the Last Word, Ripple Effect
- Determining Importance: Main Idea Wheel, Narrative and Nonfiction Pyramids, Highlighting the Highs
- Summarizing and Synthesizing: Diverge/Converge, Somebody Wanted But So, Get to the Point

Comprehension Strategy: Previewing



Previewing can set the stage for active reading by establishing a purpose. Data about adolescent readers from Graves and associates concur that previewing text before reading increases students' learning by a significant and impressive amount (Chen & Graves, 1995; Graves & Cooke, 1980; Graves, Cooke, & Laberge, 1983). Previewing enables students to *skim and scan* the potential text to determine the "why" for reading further. Previewing can create a desire and *mental hook* necessary to motivate students to read the text. This strategy is "beneficial when reading expository materials, because these texts often have explicitly marked structures (e.g., introduction, supporting details, conclusions, etc.) that help readers identify the goals of the reading" (McNamara, Ozuru, Best, & O'Reilly, 2007, p. 475). As a result of previewing, students use the *text traits* to engage them with the text and begin to discern the meaning of what they are reading. This *frontloading comprehension* process *constructs structures* to get their minds ready to read a particular type of unfamiliar text. Readers build their foundation of learning as they augment information they understand through their reading. Building background knowledge of unfamiliar vocabulary supports learners' academic achievement within specific content areas (Marzano, 2004). It is vital that teachers are cognizant of concepts in which students have little or no background knowledge so that they can build essential understandings through scaffolding previewing techniques (Fisher, Frey, & Lapp, 2009; Jensen & Nickelsen, 2008; Strickland et al., 2002).

Key Vocabulary for Previewing

- Construct Structure: to build foundational background knowledge
- Frontloading Comprehension: facilitating attention in the early stage of interacting with the text to motivate, set purpose, and prepare the readers prior to reading the text
- Mental Hook: a vivid mental image tied to something you will remember; an image to which you can attach a piece of information for recall
- Skim and Scan: to glance quickly (skim) to get the general idea of the text, and to peruse (scan) looking for specific details within the text



- Text Traits: text features, supports, and structures such as lists, headings, diagrams, and bold font

Assessment for Previewing

Use the following behaviors as a guide as you assess students' abilities to preview. Do students exhibit these behaviors never, rarely, often, or always?

- Augments background knowledge
- Uses text features and supports to preview purpose
- Applies text structures to determine purpose

Teacher Talk: Statements, Questions, and Prompts for Previewing

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the previewing strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating

Extended Thinking

Evaluating

Strategic Thinking

Analyzing

Strategic Thinking

Teacher Talk

- | | |
|--|--|
| | <ul style="list-style-type: none">• Reflect on the significance of the title. Create an alternative title.• Think about what comes to your mind when you hear the words or phrase in this heading, and propose and your own heading for this section.• How do the text supports help you question the author prior to reading? |
| | <ul style="list-style-type: none">• When you have finished reading, what new information might you have learned? How does this information align with what you have learned before?• Describe your purpose for reading this selection.• Would you consider this source to be a valid resource to help you extend your knowledge and reflect on the content? Justify your response. Why or why not? |
| | <ul style="list-style-type: none">• Think about what you read and reflect on this thought: "I have read other books by this author. I think this book will also be good because...." Explain your response.• What features help you when previewing the book? |

Applying Skill/Concept

- Identify how you supported your thinking—with the text, background knowledge, or both.
- Which details or clues from the selection did you use to frontload the content?
- Think about the topic or concepts of this selection. Explain what you already know about this topic.
- Read the title or opening paragraph, and name a book similar to this one.
- What do you notice about the text's layout?
- What are the signal words that may provide clues about what this text will explain?

Understanding Skill/Concept

- Think about what you read and reflect on this thought: "The title makes me think the book will be about...." Explain your response.
- Think about what was read and reflect on this thought: "Perhaps the pictures will provide clues about...." Explain your response.
- What does the text seem to be about?
- How is the text structured?
- Finish these thoughts: "The illustrations help me to...."; "I noticed...."
- What else do you notice from the picture or captions? What is the significance of the title?

Techniques for Previewing



Text Traits

Purpose: To identify and use text features, supports, and structures to help determine the purpose and organization of a text

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Text Traits reproducible (see Appendix), text

Procedure:

1. Preview specific text traits (Ellery, 2009) using the Text Traits reproducible to support the students' ability to anticipate what the text is about and discover the organizational structure.

Suggested Teacher Talk: *How is the text organized? What features help you when previewing the book?*

Comprehension:
Previewing

2. Have students work with a partner to investigate the various text traits.

Suggested Teacher Talk: *Which details or clues from the selection did you use to frontload the content?*

3. Have students pause throughout the reading to apply the text traits and explain how they support their understanding.

Motivation/Engagement: *Logical/mathematical.* Students create a preview guide or a scavenger hunt (Allen, 2004; Kane, 2007) to have other classmates explore, compare, and contrast the various text traits. Guide features may include text features, supports, or structures; purposes of text traits; title of book; type of genre; and page number.

Sample Preview Guide Questions:

1. Write the page number where you located an example of a political cartoon.
2. Find a chart that clarifies the data and explains reasoning.
3. Describe the gist of what you will be reading, as you peruse the table of contents.

Constructing Structure

Comprehension:
Previewing

Purpose: To generate and augment background knowledge to prepare to read for meaning

Multiple Intelligences: Visual/spatial, verbal/linguistic, intrapersonal

Materials: Constructing Structure Guide reproducible (see Appendix), print or online content text or both, highlighters or small sticky notes

Procedure:

1. Initiate the Constructing Structure process by identifying a nonfiction text or portions of texts that include examples of the author's use of text supports.
2. Guide the students to develop their Constructing Structure Guide. Students independently skim the title, illustrations, and headings to determine what they think they will learn from the selection. In notebooks or journals, students list three to five things they predict they will learn.
3. Encourage students to share their ideas with a partner.

Suggested Teacher Talk: *When you finish reading, what new information might you have learned? How does this information align with what you have learned before?*

4. Revisit the text, focusing students on subheadings, signal words, text layout, graphs, charts, and illustrations. After revisiting the text, students record the title, heading, subheadings, and other text supports in their Constructing Structure Guide or notebook.

Suggested Teacher Talk: *What do you notice about the text's layout? What are the signal words that may provide clues about what this text will explain?*

5. Guide the students to use the title, headings, and subheadings to create three prediction questions that they will try to answer while reading the text.

Suggested Teacher Talk: *How do the text supports help you question the author prior to reading?*

Motivation/Engagement: *Interpersonal.* Encourage students to work in groups to share their Constructing Structure Guides. As a whole group or in small groups, list, organize, and label categories of information students know about the topic and questions they would like to have answered.

Skim and Scan

Comprehension:
Previewing

Purpose: To process information before reading by looking for clues, searching for specific information, or reviewing information

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic, interpersonal, intrapersonal

Materials: Print or online content text or both

Procedure:

1. Use an analogy of panning for gold to help students craft a mental image, or mental hook, to clarify the technique Skim and Scan. Gold panning involves sampling an area for evidence so prospectors might know where to dig deeper to recover more gold. During the California Gold Rush of the 1800s, prospectors would sample an area with their pan by scooping up soil or gravel from a stream bed into the pan and then shaking it to encourage the heavier gold to settle to the bottom of the pan. After skimming or sampling the stream bed, the prospectors then needed to dig deeper to look for nuggets of gold. It was a painstaking but beneficial task, as there is nothing like finding gold in the bottom of the pan! The strategy of previewing text is similar, as readers skim to capture the main ideas of a text and then scan to search for specific vocabulary, ideas, or topics that will help them get ready to read and take in more detailed and complex information.
2. Have students skim the content selection they are preparing to read and have them note their initial impressions.

Suggested Teacher Talk: *Move your eyes down the page. What specific words and phrases provide clues and help you figure out what you might learn from your reading? Readers may scan a resource to determine whether they think it will answer their questions.*

3. Explain to students that after initially skimming the text, you might decide to dig deeper and scan for specific information. Encourage students to scan the text supports, such as subheadings, diagrams, charts, graphs, and any other portions that provide clues, to help clarify the content of the text.

Suggested Teacher Talk: *How does the author use text traits such as numbers, letters, and transition words to develop your understanding? What other traits are evinced in the reading? These could be boldfaced words, italics, font style, color, and marginal notes. What strategies may be needed to comprehend this text?*

4. Discuss and record the varieties of accessible text that we use on a daily basis (e.g., electronic text, newspapers, magazines) and the benefits of Skim and Scan with various types of content text.

Motivation/Engagement: *Logical/mathematical.* Ask students to brainstorm possible content-specific research topics or essential questions. Model how to use Skim and Scan with various types of content text. Students can practice the Skim and Scan technique and identify multigenre resources that would help them gather information and evaluate and interpret findings to answer their research questions.

Suggested Teacher Talk: *Would you consider this source to be a valid resource to help you extend your knowledge and reflect on the content? Justify your response. Why or why not?*

Implanting Vocabulary

Comprehension:
Previewing

Purpose: To identify and focus on the main idea by previewing, defining, and sorting key concepts

Multiple Intelligences: Verbal/linguistic, bodily/kinesthetic, interpersonal, intrapersonal

Materials: Content area text, note cards or multipurpose paper cut into strips

Procedure:

1. Select key concepts in advance of reading a content area text passage, or have students brainstorm words and phrases related to the central content theme or idea (e.g., for *democracy*, Merriam-Webster online [www.m-w.com] suggests *republic*, *self-rule*, and *self-government*). Note that the technique Implanting Vocabulary, an adaptation of Concept-Definition Sort (Kelly & Clausen-Grace, 2007), can be used in conjunction with Word Splash (see the technique Mind's Eye in Chapter 5, "Vocabulary").

Suggested Teacher Talk: *Think about the topic or concepts of this selection. Explain what you already know about this topic.*

2. Capture keywords and definitions on note cards or paper strips. Each concept is written on one card or paper strip and the definition on a separate card or paper strip. You may want to put students into small groups and assign three to five concepts to each group. The groups define their terms (using a context definition, glossary, or print or online dictionary) and record the definitions on the cards or paper strips.
3. Distribute the completed concept and definition cards. If student groups wrote the definitions, make sure groups get different terms they haven't seen at this point. Students

are encouraged to use prior knowledge and group discussion to match the concept with the appropriate definition.

4. Revisit key concepts to clarify any misconceptions, as these concepts will be encountered again through reading and class discussions.

Suggested Teacher Talk: *Confirm or modify your definitions during and after reading. How do the words connect with the content or area of study?*

Motivation/Engagement: *Visual/spatial.* Secondary students can create unique descriptions of new vocabularies by brainstorming song lyrics or titles that describe the concept (e.g., *convene* = "We Gather Together"; *mobile* = "Movin' on Out"). Have students craft and share their descriptions of new vocabulary. Students can craft lyrical descriptions in small groups or as a whole class or can maintain individual notes in their vocabulary notebooks. Encourage students to support their descriptions with nonlinguistic visual supports.

Comprehension Strategy: Activating and Connecting



When readers activate *prior knowledge* they begin connecting to their *schema*, tapping into previous experiences and knowledge to discern the meaning of what they are reading (Harvey & Goudvis, 2000; McKeown, Beck, Sinatra, & Loxterman, 1992; Schallert, 1982; Schmidt & Patel, 1987; Spires & Donley, 1998). This frontloading process allows readers to evoke relevant thoughts and memories relating to the text: "When information is read in isolation and not connected to existing knowledge, it is forgotten and deemed unimportant. Calling on existing knowledge and experiences is crucial if readers are to assimilate new information" (Tovani, 2000, p. 64). According to Keene and Zimmermann (2007), students make *text-to-self*, *text-to-text*, and *text-to-world* connections. These connections can be made from all the text traits prior to reading (frontloading) from the text features and supports, during reading (processing), and after reading (downloading). Students can also make connections to key concepts in the content areas using this structure.

Key Vocabulary for Activating and Connecting

- Prior Knowledge: previous understanding about a subject that supports gaining new information
- Schema: knowledge in memory that relates incoming information to prior experiences aligned to concepts, beliefs, expectations, and processes; prior knowledge
- Text/concept-to-self: connections made between the reader's personal experiences and the text being read

- Text/concept-to-text: connections made between other texts previously read and the text being read
- Text/concept-to-world: connections made between something occurring in the world and the text being read



Assessment for Activating and Connecting

Use the following behaviors as a guide as you assess students' abilities to activate and connect. Do students exhibit these behaviors never, rarely, often, or always?

- Activates prior knowledge to connect with text
- Identifies text/concept connections to self prior to reading
- Examines text/concept connections to other text prior to reading
- Explores text/concept connections to world prior to reading

Teacher Talk: Statements, Questions, and Prompts for Activating and Connecting

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the activating and connecting strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking	Teacher Talk
Creating	<ul style="list-style-type: none"> • Brainstorm a list of what you think of when you hear the words _____ (prevocabulary words).
Extended Thinking	<ul style="list-style-type: none"> • What do the words _____ mean to you?
Evaluating	<ul style="list-style-type: none"> • Prepare a case to present your view about _____.
Strategic Thinking	<ul style="list-style-type: none"> • Prioritize your knowledge about this subject.
Analyzing	<ul style="list-style-type: none"> • Reflect on the subject. What other content information or story do the text features or supports make you think about? What made that information or story so memorable?
Strategic Thinking	<ul style="list-style-type: none"> • What personal connection did you make when you were previewing the text? How are the events in the text traits related to your own experiences? What made the event so memorable? What are you reminded of as you preview this section?
Applying	<ul style="list-style-type: none"> • Read the title or heading to yourself and then tell me what you already know about any of the information.
Skill/Concept	<ul style="list-style-type: none"> • What comes to mind when you hear this topic?
Understanding	
Skill/Concept	
Remembering	
Recall	

Techniques for Activating and Connecting

Read and Say

Purpose: To construct meaning, self-monitor understanding, and make clear connections with complex content text resources

Multiple Intelligences: Verbal/linguistic, interpersonal, intrapersonal

Materials: Content text, highlighters or sticky notes

Procedure:

1. Students can work in groups of up to four to engage in the Read and Say process (Beers, 2003; Harste, Short, & Burke, 1988) by focusing and reflecting on what they are reading.
2. Small groups take turns reading a section, or "chunk," of text aloud. After one student reads aloud, the student to his or her right will respond using a text-to-self, text-to-text, or text-to-world connection. The student may also "say something" by making a prediction, asking a question, or summarizing.

Suggested Teacher Talk: *What puzzles you while reading? Predict what we will learn as we read the next section, or "chunk."*

3. Continue the process until groups have completed reading the text.
4. Debrief the process in a whole-group setting and continue the discussion, focusing on any challenging questions that surfaced during Read and Say.

Motivation/Engagement: Visual/spatial. Using nonlinguistic notes, encourage groups to capture and chart key ideas from the content reading passage. Groups can present their picture notes and post them in the room as a visual instructional tool.

Text/Concept Connections

Purpose: To make relevant connections between the text and self, text and another text, and text and world associations.

Multiple Intelligences: Verbal/linguistic, interpersonal, intrapersonal

Materials: Text/Concept Connections Prompts reproducible (see Appendix), content text, highlighters or sticky notes

Procedure:

1. Explain that a text/concept-to-self connection is made when something in the text or a concept reminds you of something in your own life. Use the Text/Concept Connections Prompts adapted from applying text connections (Ellery, 2009; Harvey & Goudvis, 2007; Keene & Zimmermann, 2007).

2. Using a think-aloud process, read aloud a few paragraphs from the content text or related text. Focus the students on “thinking” prompts, such as the following suggestions (also listed on the Text/Concept Connections Prompts reproducible):

Text/Concept-to-Self

- That is interesting to me because....
- This relates to my experiences....
- This reminds me of....

Text/Concept-to-Text/Concept

- The (character[s], setting, events) are similar to another text....
- This is (similar to, different from) another text I have read....
- This reminds me of another text that I have read....

Text/Concept-to-World

- This was significant in the real world....
- The reading related to the world around me....
- This text (compares, contrasts, or both) with current or historical world experiences....

3. Read the next section of the text together and have the students illustrate or write the events or information from the text on one half of a piece of paper and their personal connections on the other half.

Suggested Teacher Talk: *What made the event from the text so memorable? What are you reminded of as you preview this section?*

Motivation/Engagement: *Visual/spatial.* As they work on the Text/Concept Connections technique, students can work in groups of up to four and use the Read and Say technique structure (Beers, 2003; Harste et al., 1988) to help students focus and reflect on what they are reading. Students can refer to the posted Text/Concept Connections Prompts to support student discussion of the Read and Say.

Two-Column Entries

Comprehension:
Activating and
Connecting

Purpose: To make connections to background knowledge, reflect, infer, and clarify misconceptions before reading

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal, intrapersonal

Materials: Paper, text

Procedure:

1. Have students divide a sheet of paper into two vertical columns by folding it lengthwise. Students will use the folded paper notes as a form of Double-Entry Journals (Buehl, 2001).

This process encourages students to be active thinkers as they read, to organize knowledge, and to review materials.

2. In the left column, have students take notes on specific information from the text. On the right side, have students record their personal reactions and connections to the information. The students can label the right column “This reminds me of....” Variations for the right column of a Two-Column Entries may include the following:

- Questioning: “I wonder....”
- Making inferences: “I figured out that...because....”
- Clarifying: “I am confused about...because....”
- Determining importance: “This is important because....”
- Visualizing: “The picture I see in my mind is....”

Two-Column Entries may include other text structures such as cause/effect, concept/definition, problem/solution, compare/contrast, and proposition/support.

3. Have students share their connections and thoughts with a partner.

Suggested Teacher Talk: *How does your personal connection support understanding?*

Comprehension Strategy: Predicting



Predicting is a strategy that helps readers set expectations for reading and decide what they think will happen. Strategic readers make predictions using information from the text and their experiences to anticipate what they will be reading. Their predictions are a *forecast* of an early sign of understanding. Predicting is based on a variety of strategies, including previewing, activating background knowledge, and asking questions (Duke & Pearson, 2002; Fisher et al., 2009). Readers use clues in the title, illustrations, and details within the text to make their predictions. Creating an *anticipatory set* is a way to generate readers' interest. Anticipation guides elicit analytical thinking to develop a *hypothesis* about the type, purpose, or scope of a text as the students make a prediction on a given statement (Herber & Nelson-Herber, 1987; Readence, Bean, & Baldwin, 1981, 2008; Wood, Lapp, Flood, & Taylor, 2008). Predictions can be used before reading as a frontloading strategy and as a downloading strategy during and after reading to confirm whether students' predictions were accurate, and students can adjust them as needed.

Key Vocabulary for Predicting

- Anticipatory Set: attention-getter/curiosity hook that generates interest by tapping into students' reactions to content information
- Forecast: an estimate or logical guess by the reader about what he or she thinks will happen or what he or she knows about a subject
- Hypothesis: a tentative explanation whose merit requires evaluation



Assessment for Predicting

Use the following behaviors as a guide as you assess students' abilities to predict. Do students exhibit these behaviors never, rarely, often, or always?

- Analyzes text traits and observes clues about topic or events
- Forecasts what a text will be about
- Confirms or modifies predictions

Teacher Talk: Statements, Questions, and Prompts for Predicting

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the predicting strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking	Teacher Talk
Creating	<ul style="list-style-type: none"> • What do you think the text is going to tell you about? What makes you think so? What evidence supports your prediction?
Extended Thinking	<ul style="list-style-type: none"> • How did you formulate your prediction?
Evaluating	<ul style="list-style-type: none"> • Justify your hypothesis.
Strategic Thinking	<ul style="list-style-type: none"> • How did the processes of predicting, modifying predictions, and confirming enhance your motivation before, during, and after reading? • What are the benefits of previewing keywords and phrases before reading? • Justify your thinking as you confirm or reassess your original response to the statements.
Analyzing	<ul style="list-style-type: none"> • What makes you think _____ is going to happen?
Strategic Thinking	<ul style="list-style-type: none"> • Which predictions were confirmed by the text? • Which predictions need to be adjusted or revised? • What are you reminded of when you reflect on the vocabulary words and phrases? • Do you agree or disagree with the statement presented?
Applying	<ul style="list-style-type: none"> • Think about the text and imagine what is going on in the story. Which details or clues from the selection did you use to make your prediction?
Skill/Concept	

Understanding
Skill/Concept

Remembering
Recall

- What do you predict the author will reveal next, based on the first paragraph or chapter?
- What keywords supported you in making your prediction?
- What information do you expect to read in this selection based on the title?
- Finish these thoughts: "I wonder if _____"; "I want to know _____."
- Reflect on the keywords and phrases that you will see again in the text. What you think the text might be about?

Techniques for Predicting



Initial Sentences

Comprehension:
Predicting

Purpose: To examine opening sentences from content text and record, justify, or modify predictions

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Varied content texts

Procedure:

1. Have students explore and record the opening sentences from content text prior to reading the entire section, chapter, or complete text. By focusing on first lines (Allen, 2004), students analyze the initial sentences as foundation for their predictions.
2. After reading the initial sentences, students predict subsequent learning.
3. Encourage students to share their predictions and the clues used to make these forecasts within small groups. Capture individual or group predictions on chart paper or using a visual project device.
4. As students read the text resources through their coursework, they can revisit their predictions to discuss, confirm, or modify them.

Motivation/Engagement: *Intrapersonal.* Have the students explore the opening lines of various content area text from different disciplines. Record and collect the opening lines and generate predictions based on the initial sentences.

Suggested Teacher Talk: *How does using the Initial Sentences technique help to predict what might be discovered in the text? How did using the Initial Sentences technique provide clues to the author's pattern of organization?*

Passage/Concept Impressions

Comprehension:
Predicting

Purpose: To generate, assess, and justify evidence-based predictions

Multiple Intelligences: Verbal/linguistic, logical/mathematical, interpersonal

Materials: Fiction or nonfiction content-related text, chart paper or visual projection device

Procedure:

1. Select 7 to 10 keywords that relate to significant information from the text you are studying, and display the chain of words or phrases in the order in which they appeared in the text. For nonfiction texts, choose 10 or 12 vocabulary words and have students work with partners to create possible sentences using the presented words. Students may craft content-related sentences on varied topics. For fiction texts, words should reflect the following story elements: main characters, setting, problem, goal, events leading to the climax, and resolution (Ellery, 2009; McGinley & Denner, 1987).

Suggested Teacher Talk: *Try to imagine what is going on in the text based on the keywords presented.*

2. Have students work in teams to predict a story line (fiction) or events (nonfiction) using the words presented.
3. After students have had time to discuss their predictions, have teams create a story or passage using all the keywords. One student in the class can be the recorder and write the teams' creations on chart paper.

Suggested Teacher Talk: *Present your story creations to the entire class. Which details or clues did you use to make your prediction?*

4. After all the teams have shared their versions of the story or passage, have students compare and contrast their stories or passages.

Motivation/Engagement: *Visual/spatial.* Have students create a visual representation in a graphic organizer like a Venn diagram to compare and contrast their story or passage predictions to the original text.

Prediction Boxes

Comprehension:
Predicting

Purpose: To use authors' clues, illustrations, and key vocabulary to brainstorm, categorize, predict, and make personal connections prior to reading.

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal, intrapersonal

Materials: Multipurpose paper, print or online content text or both, chart paper or visual projection device; Optional: Prediction Boxes Grid reproducible (see Appendix)

Procedure:

1. Provide students with a plain 8½-by-11-inch piece of multipurpose paper to create their Prediction Boxes Grid (Caldwell & Ford, 2002). Students should fold the paper to yield six numbered prediction boxes. Figure 6.1 shows the six boxes and describes what goes in each box.

2. From the content text the students are preparing to read, select five to seven key vocabulary words or phrases for Box 1: Convergent Thinking. Display the list of words or phrases on a chart or visual projection device. Ask students to reflect on the initial words or phrases and write their predictions about what the text might be about in Box 1. Encourage students to share their prediction with a partner.

Suggested Teacher Talk: *Reflect on the words and phrases that you will see again in the text. In Box 1, write what you think the text might be about. What keywords supported you in making your prediction?*

3. Based on the previewed vocabulary, their generated predictions, and partner discussions, guide students to make personal connections and capture their connections in Box 2: Making Connections.

Suggested Teacher Talk: *What are you reminded of when you reflect on the vocabulary words and phrases?*

4. Use an illustration or photograph that depicts the setting, topic, theme, or characters in the text. Have students use the picture to extend their predictions by reflecting on the visual image and enhancing or modifying their predictions in Box 3: Using Picture to Extend Prediction.

5. For Box 4: Revising Prediction, select an additional five to seven key vocabulary words or phrases. Display the list on a chart or visual projection device. Ask students to compare

FIGURE 6.1. Prediction Boxes Grid

Box 1: Convergent Thinking	Box 2: Making Connections	Box 3: Using Picture to Extend Prediction
Box 4: Revising Prediction	Box 5: Confirming Predictions	Box 6: Evaluating Performance

and contrast these additional words or phrases and with the terms in Box 1. Encourage students to identify and label some categories of information that surface from the words and phrases. Students should share their predictions with a partner.

Suggested Teacher Talk: *As you reflect on the words and phrases, modify or extend your prediction. What are some categories of information that help to organize the keywords and phrases?*

6. Read the text aloud or have students read independently. Remind students to focus on the keywords and phrases and to challenge or confirm their predictions.
7. After reading, guide students to confirm or challenge their predictions in Box 5: Confirming Predictions. Encourage students to share their predictions and confirmations with a partner after reading.

8. Have students reflect on the learning process in Box 6: Evaluating Performance.

Suggested Teacher Talk: *How did the processes of predicting, modifying predictions, and confirming enhance your motivation before, during, and after reading? What are the benefits of previewing keywords and phrases before reading?*

Anticipation/Reaction Guide

Comprehension: Predicting

Purpose: To confirm or reassess predictions based on text evidence

Multiple Intelligences: Visual/spatial, verbal/linguistic, intrapersonal

Materials: Anticipation/Reaction Guide reproducible (see Appendix), content area text, student notebooks or journals, sticky notes or highlighters

Procedure:

1. Identify the main topic, major ideas, and concepts of a text prior to meeting with students.
2. Create six to eight statements that will challenge or support students' preexisting beliefs or that may reflect common misconceptions about the subject, topic, or concept. Write these on the Anticipation/Reaction Guide and provide students with print or electronic access. A balance of known information and new ideas will support students as they respond to the Anticipation/Reaction Guide statements (Buehl, 2009; Ellery, 2009; Herber, 1978; Santa, Havens, & Valdes, 2004). Record statements that students may concur with as well as statements that focus on possible misconceptions.
3. Have students read each statement and note by writing an *A* if they agree or writing a *D* if they disagree, so that students have a clear understanding of the process of predicting. Encourage students to generate evidence-based predictions, as some content area statements may be more challenging.
4. Students are encouraged to work independently as they reflect and respond to each statement on the Anticipation/Reaction Guide. Follow independent work with paired, small-group, or whole-group discussions.

5. Guide students to focus on confirming, reassessing, or modifying their predictions while reading. Students should use sticky notes or highlighters to note specific statements that align with the Anticipation/Reaction Guide statements.

Suggested Teacher Talk: *Do you agree or disagree with the statement presented? How did you formulate your prediction?*

6. Have students return to the statements after they have read the text and engage in a discussion on how the textual information supported, contradicted, or modified their first opinions. Students then record the support or evidence they found in the text.

Suggested Teacher Talk: *Justify your thinking as you confirm or reassess your original response to the statements. Which keywords or statements in the text support your ideas?*

Motivation/Engagement: *Interpersonal.* Using a similar content text source or another excerpt from the same text, assign each group of students a section of the text to create three to five statements for their own Anticipation/Reaction Guide. Using a chart or visual projection device, groups share their Anticipation/Reaction Guide statements and repeat the process for reading and confirming.

Comprehension Strategy: Inquiring and Inferring

Inquiring and Inferring are strategies that help readers to review content and relate what they have learned to what they already know through their ability to *hypothesize* about the text. Generating and asking questions supports students to identify issues and ideas in all content areas, construct meaning prior to reading, enhance understanding, discover new information, clarify, and solve problems. Making an inquiry before reading allows readers to set purposes for reading and helps them to determine what they want to learn while reading. *Shared inquiry* (Wheelock, 1999) encourages readers to explore together as they interact with the text.

Inferring is a powerful strategy that permits readers to merge their background knowledge, ask questions, make judgments from textual clues, and *extrapolate* meaning when it is not directly stated by the author. When learners infer, they go beyond the exterior details to create unique understandings of the text and extend beyond literal understanding (Keene & Zimmermann, 2007; Zwiers, 2010). When learners gather ideas and *draw conclusions*, they are able to choose the most likely explanation from the evidence in the text. They infer by reasoning from known facts or evidence that seem to require that a specific conclusion be reached to form *implied meaning*. "Inferring is the bedrock of comprehension, not only in reading . . . inferring is about reading faces, reading body language, reading expressions, and reading tone, as well as reading text" (Harvey & Goudvis, 2000, p. 105). When learners are inferring the content, as well as inferring in their everyday lives, they use *implicit* information to give a logical guess or read between the lines: "Individuals constantly make inferences as they engage in conversations with their friends, watch movies, or participate in other aspects of life" (Nokes, 2008, p. 541).



Key Vocabulary for Inquiring and Inferring

- Draw Conclusions: to combine several pieces of information to infer the author's point of view
- Extrapolate: to draw and expand from what is known
- Hypothesize: to form a tentative assumption that needs evaluation
- Implicit: understood or stated indirectly
- Implied Meaning: an idea that is not stated outright but is hinted
- Shared Inquiry: with other readers, posing questions that do not have a preconceived answer



Assessment for Inquiring and Inferring

Use the following behaviors as a guide as you assess students' abilities to inquire and infer.

Do students exhibit these behaviors never, rarely, often, or always?

- Establishes a purpose for reading by asking questions
- Generates questions to discover new information prior to reading
- Merges background knowledge and textual clues to construct interpretations of text

Teacher Talk: Statements, Questions, and Prompts for Inquiring and Inferring

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the inquiring and inferring strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating
Extended Thinking

Teacher Talk

- Reflect on how asking questions helps the reader. How does forming a question about the text help you comprehend it?
- What is the author trying to tell us with the text supports and features?
- Create the story that you think is happening between the lines. What evidence does the author provide to support...?
- Try to think of a question that will support comprehension of the text.
- What do you understand now because of your questions?
- How does self-questioning support understanding?

Evaluating
Strategic Thinking

Analyzing Strategic Thinking

- How do you combine the clues in the paragraph with what you already know to draw a conclusion?
- What reasoning helped you draw your conclusion?

- What clues does the genre style provide for gaining insight prior to reading? What are some unanswered questions?

- What facts can you derive based on the following clues...?
- What does the author want you to realize from this section?
- What would happen if...? Why do you think that would happen?
- What questions do you hope this text will answer?

- Before you start reading, ask three questions about the topic that you would like the text to answer.
- What is the story beneath the story?

- What facts can you derive based on the following clues? Make a prediction.

- What are clues to help answer your inquiries?

- What clues did the author give that led to your conclusion?
- What details or evidence supports your conclusion?

- Finish this thought: "I wonder..."

- What is the main conclusion from...?"

- Finish this thought: "This statement means...."

Applying Skill/Concept

Understanding Skill/Concept

Remembering Recall

Techniques for Inquiring and Inferring



Reflect on Questions

Purpose: To reflect on types of questions to establish a purpose for reading

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal, intrapersonal

Materials: Questioning Matrix, text

Procedure:

1. Teacher and students read a targeted passage of content text silently. When selecting the text, take into account its level of difficulty and vary the text to align it with student abilities. The selected passages may be one sentence or several paragraphs in length.
2. Revisit or explore the characteristics of varied levels of questions and sample questions (see Text Inquiry technique in this Inquiring and Inferring strategy section). Vary the questioning process by using an adaptation of the ReQuest (Kane, 2007; Manzo, 1969).

**Comprehension:
Inquiring
and Inferring**

Students ask the teacher comprehension questions relating to the content passage. Focus on the varied levels of questions (Goatley & Raphael, 1992) by providing access to Figure 6.2, Questioning Matrix. Model the process of generating questions by crafting a question from the text passage and justifying the type of question as well as your own thought process.

Suggested Teacher Talk: *Reflect on your thinking as you generated questions. Justify your choice of question starters (question words) to align with the levels of questions.*

3. Reverse roles so that the teacher asks the students varied levels of comprehension questions relating to the next section or passage in the text. Continue this process with subsequent sentences or passages.
4. Prior to completing the entire segment of content text, encourage the students to establish a defined purpose for reading by making a prediction about the remainder of the text.

Suggested Teacher Talk: *How does self-questioning help you establish a purpose for reading the rest of the content passage?*

5. Facilitate a postreading discussion comparing and contrasting the varied levels of questions and encouraging the use of higher order thinking and questioning.

Suggested Teacher Talk: *Describe the relationship between literal, interpretive, and evaluative questions and your thinking process as you generated comprehension questions.*

Motivation/Engagement: *Logical/mathematical.* Present examples of open questions (Small, 2010) like those in the following list, or a broader question that encourages choice and varied levels of responses. Provide students with answers to the content question and have the students respond with the questions.

- *The answer is _____. What might the question be? (The answer is c^2 . What might the question be?)*

FIGURE 6.2. Questioning Matrix

Levels of Questioning	Question–Answer Relationships	Descriptors
Literal	Right There	Answer is targeted in the text (<i>Where? How many? What?</i>)
Interpretive	Think & Search	Answer is in the text, but in more than one location (<i>What are the reasons...? Identify three causes for...?</i>)
Evaluative	Author and You	Reader makes connections to text (<i>The author suggests.... The text purposed to....</i>)
Critical	On My Own	Reader makes personal connections based on central themes, ideas, and emotions presented in the text (<i>My opinion is.... My experience leads me to believe....</i>)

Note. Adapted from Wood, Lapp, Flood, & Taylor, 2008.

- *How are _____ and _____ alike? How are they different? (How are immigration and relocation alike? How are they different?)*
- *Initiate a one-minute conversation with your partner using the concepts of _____, and _____. (Initiate a one-minute conversation with your partner using the concepts of mean, median, and mode).*

Authentic Questions (3Rs)

Purpose: To record, react, and reflect on real, authentic questions that surface during reading to move toward a deeper understanding of content text

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Student notebooks or journals, content text

Procedure:

1. Students can create their own 3R Question Logs (Ellery, 2009) by folding a piece of multipurpose paper lengthwise to make three columns. Label each column: *1R* for recording questions; *2R* for reactions; and *3R* for reflections. Students use their 3R Question Logs to capture key questions.
2. **Record:** Discuss and model types of authentic questions (Santa et al., 2004) that surface as you read (e.g., challenging concepts, historical events, steps or procedures, literary elements). Record example student-generated questions and facilitate a class discussion of possible answers to some of the questions.

Suggested Teacher Talk: *As you are reading, record any questions that surface. Which questions does the author address within the text?*

3. **Reactions:** As they continue to read, encourage students to note their reactions in the *2R* column.

Suggested Teacher Talk: *What did you wonder about while reading the text? What are some unanswered questions?*

4. **Reflections:** In the *3R* column, students record reflections and connections after reading.

Motivation/Engagement: *Intrapersonal.* Encourage students to reflect on the process of generating authentic questions while reading. They can record their thoughts in the final (*3R*) column of their question log.

Suggested Teacher Talk: *How does self-questioning support understanding?*

Text Inquiry

Comprehension:
Inquiring
and Inferring

Purpose: To understand and apply varied types of questions and stimulate thinking about the reader's role in answering questions

Multiple Intelligences: Visual/spatial, verbal/linguistic, logical/mathematical, interpersonal

Materials: Questioning Matrix (see Figure 6.2 in the Reflect on Questions technique in this chapter), content text, multipurpose paper, student notebooks or journals

Procedure:

1. Using the Questioning Matrix support students to explore the characteristics of varied levels of questions and sample questions. Focus student discussions to recognize that the levels of questions presented in Question–Answer Relationships (Raphael, 1986; Raphael, Highfield, & Au, 2006) and Learning From Text Guides (Wood, Lapp, Flood, & Taylor, 2008) can be aligned based on the levels of thinking needed to derive answers.
2. Using a familiar content passage, model crafting varied levels of questions and chart sample questions as a visual support.
3. Students will work in pairs or small groups to practice answering the different types of questions, which should be crafted by the teacher in advance. Encourage teams to craft questions representing the varied levels of questions and justify their responses in student notebooks or journals.

Suggested Teacher Talk: *How does the level of questions guide your thinking as you answer questions?*

4. Have students share their questions, levels, and possible answers with the whole group. Discuss any challenging areas and reread to confirm accuracy of answers.

Motivation/Engagement: *Intrapersonal.* Using sample content assessment questions and text questions, students use the characteristics presented in the Questioning Matrix to determine levels of questions.

Suggested Teacher Talk: *Which levels of questioning are most often noted in class assessment? Which levels are more frequently used in the content text questioning? How does understanding how to craft varied levels of questions support in effectively responding to questions?*

Save the Last Word

Comprehension:
Inquiring
and Inferring

Purpose: To make personal connections to information in the text, construct interpretations, and compare the interpretations with others

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic, interpersonal

Materials: Text, note cards

Procedure:

1. Choose a text that may elicit differing opinions or multiple interpretations. As students read the passage, have them select five statements that they find interesting or would like to comment on—statements they agree or disagree with or that contradict something they thought they knew.
2. Students write one statement on the front of each of the five index cards. On the back of each card, they write the comment they want to share with the group about that statement.
3. Place students in small groups. When students meet in their group, they select one person to go first. That person reads the statement from the front of one of his or her cards, but is not allowed to comment. All other students, in turn, respond to the statement, make comments, share what they think the quote or statement means, and agree or disagree.
4. When the discussion eventually moves around to the student who wrote the statement, that student flips over their index card and has *the last word* as he or she explain why it was selected. This student has an opportunity to adjust his or her comments and reflect on ideas before expressing them to the group.
5. The sharing process is repeated until everyone in the group has had *the last word*. This technique can be used as an after-reading activity in all subjects for almost any topic and offers reluctant speakers an opportunity to safely share their ideas and discover common elements.

Ripple Effect

Comprehension:
Inquiring
and Inferring

Purpose: To generate questions and stimulate dialogues based on the questions

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic, interpersonal, naturalistic/environmental

Materials: Text; Optional: a picture of a still lake or pond

Procedure:

1. Select a text, theme, or concept to introduce to the class.
2. Have the students visualize what happens when you throw a pebble into a still lake. There is a splash, and you may never hear the pebble hit the water. You will notice concentric circles rippling out from the entry point. Students may even describe other effects when the pebble enters the water (e.g., scare a fish, hit another rock, frighten someone near the pond). By throwing the pebble into the water, you have caused change through the ripple effect.
3. Connect this visualization to what happens in your head as you think about a story or idea. The pebble can represent a question that you form and toss out into the sea of unknown. A ripple of thoughts or a wave of thinking begins to spread and expand from the point of origin.

4. During a read-aloud, model for students when a thought or question occurs in your mind; stop and toss the pebble into the water. Share the question and let the “wave of thinking” ripple into the conversation about the text. Depending on how deep the concept, the waves can lead to further research and more reading. Students work independently or in small groups to initiate the ripple effect by posing a question aloud for others to respond to and discuss.

Motivation/Engagement: *Logical/mathematical.* It is important to teach students to ask inferential and applied-level questions. These higher level questions help students to think more critically. They will enjoy creating questions that cover the reading, along with the accompanying answer document.



Comprehension Strategy: Determining Importance

Determining importance enables learners to distinguish the most important information that highlights the *essential* ideas, concepts, or theme of a text. Readers determine what is important based on the purpose of reading and their ability to evaluate what are the most critical *details* to support the overall meaning. Strategic readers can determine the difference between an important detail and an interesting fact that supports the *main idea*: “Readers cannot store all the information presented in a text in their minds. *Sifting* [emphasis added] through information to determine the most important points ensures that working memory is not overloaded and continues to process information” (Fisher et al., 2009, p. 51). Before and after reading, *sensory language* supports readers to form appropriate mental images, providing a springboard for recall of descriptive details within the text. Determining importance allows reading to be an active process by stimulating the mental interchange of new ideas and experiences and creating sensory images. Forming these images during reading seems to increase the amount readers understand and recall for important details (Irwin, 1991; Johnston, Barnes, & Desrochers, 2008; Sprenger, 2005). Determining importance allows learners to process the value of information in fiction and nonfiction text in all disciplines by prioritizing the content for deeper understanding.

Key Vocabulary for Determining Importance

- Details: specific ideas and facts that are critical to the topic or content
- Essential: fundamental to bringing meaning
- Main Idea: the most important fact, concept, or idea of the text
- Sensory Language: words that convey the connections between the ideas and the five senses
- Sifting: evaluating and sorting details to find those that are important

Assessment for Determining Importance

Use the following behaviors as a guide as you assess students’ abilities to determine importance. Do students exhibit these behaviors never, rarely, often, or always?

- Determines essential information (key idea, theme, or concept)
- Uses supporting details from the text to clearly explain why information is important
- Uses senses to attend to text details

Teacher Talk: Statements, Questions, and Prompts for Determining Importance

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the determining importance strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom’s taxonomy and Webb’s DOK levels.

Level of Thinking

Creating
Extended Thinking

Evaluating
Strategic Thinking

Analyzing
Strategic Thinking

Applying
Skill/Concept

Understanding
Skill/Concept

Teacher Talk

- Think about the facts and create questions you have about the information presented.
- Generate evidence that the author used to support his or her case.
- What sensory details did the author use to help you create a picture of the story or information in your mind?
- What do you think the author is trying to tell you?
- Which facts are important or essential to the text? Why?
- Justify why you chose to highlight this part: “I chose to highlight this part because....”
- How did you know these details were more important than other details?
- Describe the difference between what you need to know and what is just interesting.
- What is essential?
- Which facts are important or essential to the text?
- What is the author’s message?
- Explain what the author offers as a theme or opinion.
- What does the author offer as a theme or opinion?
- Notice that the cue words are followed by important information. What are the most important in this reading?

Remembering
Recall

- Use the margin to make notes. Highlight only necessary words and phrases.
- Answer this question: "What should I remember?"
- Look carefully at the first and last line of each paragraph.
- Tell me about some of the important ideas that struck you.



Techniques for Determining Importance

Comprehension:
Determining
Importance

Main Idea Wheel

Purpose: To identify the main ideas and important details in challenging content text

Multiple Intelligences: Visual/spatial, verbal/linguistic, interpersonal

Materials: Main Idea Wheel reproducible (see Appendix), text

Procedure:

1. Begin by modeling using a whiteboard or visual projection device. Choose a familiar text and read an excerpt aloud. Have students determine the main idea and record it in the center of the wheel. Students decide which details are most important or essential to developing the main idea. Model the process for recording the main idea and details on the main idea wheel.
2. Have students work with partners to create a Main Idea Wheel for a novel or nonfiction content text you are reading in class. Students will record the identified main idea and details on their own wheels. This makes a guide for small- or whole-group discussion.

Motivation/Engagement: Bodily/kinesthetic. Create a large Main Idea Wheel on chart paper or in an electronic format. Choose a content text and as a group determine the main idea. Divide students into groups with each being assigned a different section or chapter of text to determine the essential details. One member of each group will bring their piece of the Main Idea Wheel to a designated display area in the classroom. As each group adds their piece, a class Main Idea Wheel is created as a visual of the main idea and details in the text.

Narrative and Nonfiction Pyramids

Comprehension:
Determining
Importance

Purpose: To organize key elements from content text

Multiple Intelligences: Visual/spatial, verbal/linguistic, logical/mathematical

Materials: Narrative Pyramid reproducible (see Appendix), Nonfiction Pyramid reproducible (see Appendix), text, paper

Procedure:

1. Have students determine which pyramid they will be using based on either narrative or nonfiction text. If it is a narrative text, have them construct an eight-line narrative pyramid of words (Ellery, 2009; Schwartz & Bone, 1995) before using the Narrative Pyramid reproducible. If the text is nonfiction, they can use the Nonfiction Pyramid reproducible to process the information.

Suggested Teacher Talk: *Think of all the parts in the text and put them together as if you were to tell another person the "story" or key points of the text.*

2. The first line of the narrative will contain the character's name in a single word. For nonfiction, this will be one major idea.
3. For the second line, have students use two words to describe that character. For nonfiction, this will be two supporting details.
4. For the third line, students write three words to portray the setting, or they can add three different locations. For nonfiction, this will be a major idea, or a geographical location if applicable.
5. For the fourth line, ask students to explain the problem using four descriptive words or four specific conflicts occurring in the text. For nonfiction, if a conflict or problem isn't applicable, students write four words describing another supporting detail.
6. For lines five, six, and seven, students describe three different events that occurred and use the corresponding number of words for their lines. For nonfiction, if three different events don't apply, these lines can include author's purpose and vocabulary words.
7. For the eighth line, the student selects eight words to express the solution to the problem or conflict.
8. Have students use their pyramids to give an oral summary of the text.

Suggested Teacher Talk: *Using your pyramid, describe the detail in the content.*

Highlighting the Highs

Comprehension:
Determining
Importance

Purpose: To determine important information and ideas in text for understanding, discussion, or writing

Multiple Intelligences: Verbal/linguistic, interpersonal, intrapersonal

Materials: Varied content texts, highlighters or small sticky notes

Procedure:

1. Students should skim or preview the passage, focusing on text structure (e.g., boldfaced headings, subheadings, key vocabulary) and the author's purpose.

Suggested Teacher Talk: *What message is the author communicating in the passage?*

2. Model the process for highlighting important information. Use a think-aloud to model the following tips for effective highlighting:

- Be selective in highlighting; focus on key ideas, new vocabulary, and ideas that you find surprising.
- Highlight keywords and phrases rather than whole sentences.
- Use sticky notes or marginal notes to jot down your thoughts, questions, and concerns while reading.
- Read one or two paragraphs at a time and then highlight.
- You are probably highlighting too much information if your page appears fluorescent.

3. Encourage students to share their highlighted information and work with a partner to read, discuss, and highlight the highs in the next section of text.

Suggested Teacher Talk: *Justify your reasoning for selecting your highlighted information.*

Motivation/Engagement: *Visual/spatial.* With students in small groups, assign each group a section of text to read, discuss, and highlight the highs. Student groups collaborate to compare and justify their highlighted information as they prepare to “teach” the key ideas from their assigned passage to the whole class. Groups can use picture notes, webbing, or two-column note-taking to create a visual representation as they share their section with the class.

Suggested Teacher Talk: *Ask yourself, “How can I structure this information to make it my own?”*



Comprehension Strategy: Summarizing and Synthesizing

Summarizing is a strategy that enables the reader to identify and organize essential information by putting together key elements of what they are reading. Students continually organize these *key elements* throughout their reading of a text while filtering out less significant details. Research suggests instruction on summarizing can improve students' overall comprehension of text content (Duke & Pearson, 2002). Summarizing includes selecting important information, making *generalizations*, and succinctly reducing the passage into a compilation of facts. Text guides can support the readers to deconstruct the main ideas to form a summary (Montelongo, 2008).

Synthesizing merges the summary of new information with prior background knowledge to create an original idea. Strategic readers stop periodically while reading to digest what they have read, allowing them to make judgments that promote higher order, *elaborative thinking*. This thinking process combines the results of developing thoughts into a

conclusion to interpret or evaluate, and adds information to the summary (Fisher et al., 2009). The ability to synthesize when reading integrates all of the comprehension strategies described previously in this chapter—which itself, actually, is synthesizing.

Key Vocabulary for Summarizing and Synthesizing

- Elaborative Thinking: to expand from detail; concurs in conjunction with analysis of the information
- Generalizations: broad understandings reached by applying inductive reasoning
- Key Elements: brief and related ideas, events, details, structural clues, or other information that supports the reader in bringing meaning to the text

Assessment for Summarizing and Synthesizing

Use the following behaviors as a guide as you assess students' abilities to summarize and synthesize. Do students exhibit these behaviors never, rarely, often, or always?

- Identifies and organizes essential information
- Monitors and evaluates text for meaning
- Combines information and forms new thoughts based on that information

Teacher Talk: Statements, Questions, and Prompts for Summarizing and Synthesizing

The following are suggestions for teacher talk that encourages readers to think strategically as they employ the summarizing and synthesizing strategy. Try using some of these statements, questions, and prompts with your students as you work through the techniques in the following section. They are aligned with Bloom's taxonomy and Webb's DOK levels.

Level of Thinking

Creating

Extended Thinking

Evaluating

Strategic Thinking

Teacher Talk

- What new ideas or information do you have after reading this text?
- Create a new idea based on parts from this information.
- Propose an alternative to the situation.
- How can you use key ideas to condense the information in this story?
- How could you test your theory?
- What do you understand now that you did not understand before?
- How has your thinking changed since reading that part of the text?

Analyzing
Strategic Thinking

- How can you describe your overall understanding of the story in a few sentences?
- Which details are most and least significant to the overall meaning?
- Which words helped you describe the gist of the story?

Applying
Skill/Concept

- Think of all the parts in the story and put them together as if you were going to tell another person about the story. How could you summarize or say this using only a few sentences?

Understanding
Skill/Concept

- Complete this statement: "The text is mainly about..."
- What was the focus of the reading selection?
- What is the gist of the story?

Remembering
Recall

- What clues are within the text?



Techniques for Summarizing and Synthesizing

Comprehension:
Summarizing
and Synthesizing

Diverge/Converge

Purpose: To organize, capture key concepts, and summarize challenging content text

Multiple Intelligences: Visual/spatial, verbal/linguistic, bodily/kinesthetic

Materials: Note cards for each student, content text passages, chart paper or visual projection device, available technology resources; Optional: Get to the Point reproducible (see Appendix), Main Idea Wheel (see Appendix)

Procedure:

1. Group students into groups for the Diverge part of this technique. Assign each group a section of content text.
2. Model and review various summarizing tools, such as using the Get to the Point reproducible (see Appendix), Main Idea Wheel (see Main Idea Wheel technique in the previous Determining Importance strategy section), graphic organizers, or technology tools (e.g., SMART Board or Promethean interactive whiteboard)
3. Divergent thinking involves pulling a topic apart to explore its various components. To illustrate this process, each group is responsible for determining key information and ideas from their section of text and using a visual representation to "teach-back" in a whole-group setting. Each visual representation must include a written summary statement.
4. Post a large piece of chart paper or use a visual projection device to display the groups' visual representations. In the center of the chart, present the title of the chapter or article from which the groups' text sections were drawn.

5. To reassemble, or converge, the different ideas (convergent thinking) each group will present a 3–5 minute teach-back. Encourage students to question, discuss, and note key ideas from each group presentation.

Suggested Teacher Talk: *How did the groups' visual representations support you in creating a summary statement?*

6. As each group presents, they add their visual display around the chapter or article title.
7. Facilitate a whole-group debrief of the summarizing process.

Motivation/Engagement: *Logical/mathematical.* Encourage students to create a one-sentence summary statement capturing the gist, or key ideas, presented in the chapter or article by using all the groups' visual representations and summary statements. Share summary statements in pairs, small groups, or as a whole group.

Somebody Wanted But So

Purpose: To use a tool for summarizing information and ideas, making connections, and remembering important information

Multiple Intelligences: Visual/spatial, verbal/linguistic, intrapersonal

Materials: Fiction or nonfiction narrative text, Somebody Wanted But So (SWBS) organizer

Procedure:

1. Model using Somebody Wanted But So (Ellery, 2009; Schmidt & Buckley, 1990) to retell a life event or a movie. Write the SWBS framework on the board or overhead in a four-column chart. Students will identify the *Somebody* as the main character or historical figure, as you record it on the chart.
2. Explain that *Wanted* represents the plot or motivation that is occurring to the *Somebody*. Record the students' responses in the *Wanted* column.
3. Explain that *But* stands for the conflict or challenge the *Somebody* faces. Record students' responses on the chart.
4. Share that *So* represents the outcome or resolution. Record student responses in the *So* column.
5. Read aloud the summary statement that the SWBS framework creates.
6. Have students use the SWBS chart to summarize a narrative text that they all have read. Have them share as you record responses in the chart on the board.
7. Explain how students can use this SWBS framework to help them summarize any narrative text. If they are using this technique with a longer novel, they can write a SWBS for each chapter. It also helps students identify main ideas and details, recognize cause-and-effect relationships, make generalizations, and analyze points of view.

Comprehension:
Summarizing
and Synthesizing