

PART

I

01

The Knowledge Gear

“We are evolving from being cultivators of personal knowledge to being hunters and gatherers in the electronic data forest.”

—Nicholas Carr, *The Shallows: What the Internet is Doing to Our Brains*

Twenty-first century science offers a new way of looking at and understanding the workings of the human brain. We now know, for example, which areas of the brain activate when we decipher a written word, that a genetic variation might be at the root of dyslexia, and that the recycling of neural networks in our brains may be what allows us the uniquely human abilities of reading and writing. Neuroscientist Stanislas Dehaene (2009) refers to this new way of looking at reading and learning as the “neurocultural approach.” Although these theories and understandings are just now materializing, there have long been five basic principles with implications not only for the learner but also for the content-area teacher who wants to plan instruction that helps students improve both their reading comprehension and their content learning.

Revisiting the Five Basic Premises of Teaching Reading

As columnist, author, and cultural observer David Brooks observes, we experienced a scientific revolution during the last 30 years that revealed more about the human brain than had had been discovered in the previous 3,000 years. He asserts, “Brain research rarely creates new philosophies, but it does validate some old ones” (2011, p. xiii), and we agree. Using today’s lens of brain-based research to look at the five premises that cognitive science previously identified as basic to teaching content-area reading skills, we find they still hold true.

Premise 1: The reader constructs the meaning of a text

A reader actively constructs meaning by making seemingly logical, sensible connections between new information and existing knowledge about a topic (Duke & Pearson, 2002). Researchers believe that what we know from prior knowledge and past experience is stored in knowledge “frameworks” called schemata. One way to think of schemata is to visualize mental maps that provide a structure or guide for understanding new material. Schemata are not distinct from one another; rather, they are highly interrelated and significantly impact comprehension. Learners draw on these schemata to make inferences and predictions, to organize and reflect on new information, and to elaborate on that content (Vacca & Vacca, 1993).

The brain is a dynamic organ, shaped to a great extent by our experiences. When learners are confronted with new information, they try to make sense of it by seeing how it fits with what they already know. For example, we use the schema of “driving a car” the first time we try to operate a boat, jet ski, or snowmobile. Alternatively, we might use the familiar schema of our local neighborhood’s grid of streets to get our bearings in a new city. To further illustrate the power of these schemata, try reading the following passage:

I cdnuolt blveiee that I cluod aulacly uesdnatnrd what I was rdanieg. The pha-
nomneal pweor of the hmuan mnid, aoccdrnig to a rscheearch at Cmabrigde
Uinervtisy, it dseno’t mtaetr in what oerdr the ltteres in a word are, the olny
iproamtnt tihng is that the frsit and last ltteer be in the rghit pclae.

How did you do? This simple exercise illustrates the fact that deriving meaning is not just a matter of reading words on a page. In order to comprehend, the reader selects a schema that seems appropriate and connects it with the new information, filling in gaps so the text makes sense. “Teachers have a critical role in assisting learners to engage their understanding, building on learners’ understandings, correcting misconceptions, and observing and engaging with learners during the processes of learning” (Bransford, Brown, & Cocking, 2004).

An interesting display of this phenomenon is in the experiments of Dutch clinical psychologist Christof van Nimwegen. In 2003, while studying computer-aided learning, he found that participants using “helpful” software programs with features that provided lots of clues designed to more easily solve a puzzle did not do as well as participants who struggled to solve the puzzle with a “bare-bones” program. After eight months of repeated experiments, van Nimwegen concluded that participants who did not rely on their computers to handle cognitive tasks built knowledge structures, or schemata, in their brains to apply to new situations (van Nimwegen, 2008). In the long run, the home-grown schemata beat out the fancy manmade technology. There isn’t always a “winner” in technology versus human brain competitions. In February 2011, IBM’s supercomputer Watson handily beat

two former *Jeopardy!* champions on the nightly quiz show, providing not only entertainment but also further encouragement to learn more about the brain's machinations.

Premise 2: Prior knowledge plays an important role in learning

Prior knowledge includes the content knowledge and personal experiences that readers bring to any learning task. According to Vacca and Vacca, “the single most important variable in learning with texts is a reader’s prior knowledge” (1993, p.13). By activating prior knowledge and generating interest, a teacher creates a context for students to approach reading with purpose and anticipation (Vacca & Vacca, 2005). Strategies that help readers “take out and dust off” prior knowledge before reading enable them to make more connections and learn more while they read. Those readers whose prior knowledge is accessible and well developed remember more from their reading than do readers whose prior knowledge of the topic is limited. Research and common sense tell us that the more a reader brings to a text in terms of knowledge and skills, the more he or she will learn and remember from it (Anthony & Raphael, 1989; Dole, Valencia, Greer, & Wardrop, 1991).

Nevertheless, accessing prior knowledge is not always easy. If information in the text is unclear, disorganized, or does not make sense to students, they may struggle to call up relevant prior knowledge. In addition, their purpose for reading will influence how they use their prior knowledge to make connections to the new information; this, in turn, affects comprehension. In one study, students who were told to read a description of a house as if they were home buyers were able to recall its location and number of bathrooms, whereas students who were told to read the selection from the perspective of a burglar remembered information about security systems and the number and location of windows (Jones, Palincsar, Ogle, & Carr, 1987).

Students may also have difficulty activating prior knowledge if that knowledge is what some researchers refer to as “inert knowledge”—knowledge students have but can’t access because they lack the appropriate strategies that help learners retrieve what they know (Bransford, Sherwood, Vye, & Rieser; 1986). As classrooms grow more diverse, it’s important to remember that no two students bring the same backgrounds and experiences to class, and no two students will comprehend a text passage in the same way. The same classroom may include students whose families are highly educated and encourage reading of all kinds from an early age, students whose experience of the world is limited to what they see on television, and students for whom English is a second—or even a third—language. You can help all students prepare for reading by incorporating prereading strategies, such as brainstorming, providing analogies, or using advance organizers, all of which serve to activate and assess learners’ prior knowledge. Eliciting this knowledge gives readers a structure on which to attach new knowledge. Building and activating prior knowledge, particularly in a content-area classroom, is a powerful predictor of comprehension.

Premise 3: Reader comprehension depends heavily on metacognition

Metacognition is the ability to think about and control the thinking process before, during, and after reading. Students who have learned metacognitive skills can plan and monitor their comprehension, adapting and modifying their reading accordingly. Depending on the type of written material, the delivery medium (electronic or print), and their reasons for reading, students will decide whether to skip, skim, and flip or to read carefully. Throughout this process, students monitor the meaning they are constructing, and when the text (e.g., an editorial in an online news magazine) does not meet their purposes—such as reading for evidence to support their own opinion or argument—they may switch to another text that fits their needs and allows them to complete their assignment.

Ineffective readers, on the other hand, often don't realize they should be doing something while reading except moving their eyes across the page. They are unaware of the complexities of reading and have never been taught to think about what they are reading, create mental pictures, or ask questions (e.g., *Do I understand this? What should I do if I don't understand? Do I get the author's point? How does it fit with what I already know? What do I think the author will discuss next?*).

A student who hasn't been taught how to think about what he or she is learning might say something such as, "No, I didn't finish reading the homework. It was way too hard. I mean, I have no clue about chromosomes, or whatever the chapter was about. How can you expect me to read the chapter if it doesn't make any sense?" Alternatively, you might hear something such as, "What did we read yesterday? Well . . . uh . . . I think it was something about . . . Bosnia, no, wait . . . um . . . maybe it was Botswana? I don't know . . . it was about some foreign country that started with a B." Of course, there is always this all-too-familiar comment: "But I *did* read the assignment. I just don't remember it. I never do. I can read something three times and still not remember what I read."

Students who struggle while reading often give up and lose confidence. To them, reading comprehension is something of a mystery. Unaware that they have an active role to play in their learning, these students think comprehension simply happens, and when they aren't successful at understanding what they read, they tend to blame the text or themselves. The key to helping students take control of their own processes while reading involves deliberate attention to text content. McKeown and Beck (2009) suggest that teachers deliberately ask questions, use prompts, and encourage students to elaborate on what they read. Low-achieving students, in particular, need to be taught appropriate methods to monitor their understanding and how to select and use appropriate "fix-up" strategies when needed (Caverly, Mandeville, & Nicholson, 1995; Pogrow, 1993). Fix-up strategies include the think aloud, wherein students practice verbalizing their thoughts, and text coding, whereby students use symbols to mark up materials while reading (see Strategy 35 in Part II). The former helps students recognize their reading and thought processes; the latter helps them track their thinking.

One of the most important things a teacher can do to increase student readiness to learn is plan prereading activities. A particularly apt term for this method of prereading instruction is *frontloading*. By practicing frontloading techniques (e.g., building background knowledge of the topic, preteaching critical vocabulary concepts, setting a purpose for reading, focusing students' attention on the topic, cueing students about relevant reading strategies), we not only help increase readiness to learn but also foster strategic reading behavior.

Premise 4: Reading and writing are integrally related

Despite a decades-long debate about the specific connections between reading and writing processes, researchers agree they are inherently connected. Laflamme (1997) describes the reading and writing processes as being analogous and complementary because each involves generating ideas, logically organizing them, revisiting them several times until they make sense, and then revising or rethinking them as needed. Given this connection, it's easier to understand why avid readers tend to be good writers, and vice versa.

Teachers should know about this connection because they will, without question, have students who don't like to do either one—read or write. This situation presents the perfect teachable moment. When students resist reading and writing, you have an opportunity to share your knowledge and show them how to think like readers. Demonstrate how effective readers use a repertoire of strategies, such as reading aloud, rereading, and asking questions, to clarify ideas and make sure they understand what they read.

Of course, writers also contribute to how well readers are able to read and understand a text. Describing the relationship between reading and writing, Harvey and Goudvis simply say, "The reader *is* part writer" (2000, p. 5). They therefore advise teachers to have students read with a pencil or pen in hand in order to take notes, create individualized symbols and codes, and write down questions that arise as part of the process. By interacting with a text in these ways, students begin to grasp that reading and writing are active processes that require them to be engaged with the text if they are to comprehend, remember, and apply their learning. Harvey and Goudvis (2007) also, somewhat radically, recommend that students throw out their highlighters, which can fool them into thinking they are reading actively when they, in fact, are not.

Several researchers have found that improving students' writing skills, in addition to their reading skills, improves their capacity to learn (e.g., Buerger, 1997; National Survey of Student Engagement, 2008; Report of the National Commission on Writing, 2006; Tierney & Shanahan, 1991; Tynjala, Mason, & Lonka, 2001). A writer's language choices and knowledge of the topic, as well as his or her skill in using written language for a particular purpose, influence the reader's ability to construct meaning.

The degree to which readers and writers share the same understanding of the language and the topic of the text influences how well they communicate

with each other. . . . For example, through reading readers learn the power of a strong introduction and eventually use such knowledge as they write their own pieces. Conversely, writing develops awareness of the structures of language, the organization of text, and spelling patterns which in turn contributes to reading proficiency. (Commission on Reading of the National Council of Teachers of English, n.d., para. 6, 14)

Graham and Hebert call writing an “often-overlooked tool for improving students’ reading, as well as their learning from text” (2010, p. 4). They recommend that students write about the texts they read, teachers teach the skills and processes that go into creating text, and schools increase the amount of time students write. The results of their studies suggest that writing has the potential to enhance reading in at least three ways:

1. As functional activities, when reading and writing are combined, they facilitate learning (e.g., writing about information in a science text requires a student to record, connect, analyze, personalize, and manipulate key ideas in the text).
2. They each draw upon common knowledge and cognitive processes; therefore, improving students’ writing skills should lead to improved reading skills.
3. They both are communication activities and vehicles for better comprehension (i.e., writers gain insight about reading by creating their own texts, which leads to better comprehension of other texts).

Indeed, teachers who integrate reading and writing in content-area instruction often view it as a natural fit:

- They are reciprocal processes, where writers learn from reading, and vice versa.
- They are parallel processes—both are purposeful and dependent on background knowledge, and both focus on the construction of meaning.
- They naturally intersect in the process of learning.
- Both are social activities driven by a need for communication.

Further underscoring this connection is research that shows students who are taught how to write and edit different forms of expository text demonstrate improved comprehension of content-area textbooks (Pressley, Mohan, Raphael, & Fingeret, 2007; Raphael, Kirschner, & Englert, 1988). Research also has shown that when students have opportunities to write in conjunction with reading, such as when they write summaries of material they just read, they are better able to think critically about what they read (Marzano, 2010).

Similarly, many related writing skills, such as grammar and spelling, reinforce reading skills. However, research also indicates grammar instruction is not effective and may actually be harmful to writing development. Grammar, when taught in isolation, tends to

stay in isolation; students fail to integrate the rules of grammar into their writing. When they view grammar as a tool for writing, however, they are more apt to find the rules useful and will more readily apply them to achieve their writing purpose. Alternatively, teaching students sentence structure, summarizing techniques, and writing strategies (e.g., brainstorming, outlining) significantly improves their writing (Kolln & Hancock, 2005). Many teachers have success teaching students the multistep learning process (i.e., discovering, drafting, revising, editing, proofreading), and Biancarosa and Snow (2006) concur that learning the writing process is helpful, as long as the practice writing tasks are similar to those students will encounter and be expected to perform in high school, college, and future careers.

Donna Alvermann (2002), an expert in adolescent literacy, urges all teachers, regardless of their content-area expertise, to encourage students to read and write in different ways. Doing so, she believes, challenges students to solve problems and think critically, thus raising the so-called cognitive bar. There are many creative ways teachers can connect reading, writing, and content. The best part, of course, is that you are limited only by your imagination. Here are a few examples of assignments that help students make reading-writing-content connections:

- Students read about, analyze, and write about one of their favorite athlete's abilities and achievements.
- Students read biographies of historians, scientists, and artists to understand the genre, and then each student interviews a family member and writes a biography about that person.
- Students read primary source documents about a specific historical event from the National Archives website, and then each student writes a story as if he or she were present at and part of that event.
- Students read the scientific explanation for how planets form, identify and read a myth (from any number of various cultures) that explains how Earth was formed, and then write their own myths about the birth of a planet.
- Students research and read about a famous painting, sculpture, or building and then write about the feelings it evokes in themselves and others.

Researchers agree that improving students' reading and writing skills improves their capacity to learn (National Institute for Literacy, 2007). Therefore, effective adolescent literacy programs must include an element that helps students improve their writing skills, but it is not enough simply to ask students to do more writing. Students must receive intensive writing instruction that has clear objectives and expectations and consistently challenges them, regardless of their ability, to engage with academic content at high levels of reasoning (Biancarosa & Snow, 2006). Harvey and Goudvis recommend that teachers

should encourage students to jot down their thinking in logs or notebooks (or e-logs or e-notebooks) as they read. Their point is that “writing about reading should enhance engagement and understanding, not interrupt it and bring it to a halt” (2007, p. 59).

A final thought—and perhaps the most concisely stated one about the reading-writing-learning connection—comes from Vacca and Vacca (2005), who observe that when students write, they explore, clarify, and think deeply about the ideas they read. This, ultimately, is the essence of the reading-writing connection.

Premise 5: Learning increases when students collaborate

Students learn by interacting with others in the classroom, by generating and asking questions, and by discussing their ideas freely with the teacher or one another. Conversation not only sparks new ideas but also provides an opportunity for the speaker to deepen his or her understanding of an idea or topic. Well-known literacy expert Judith Langer (2000) notes that in schools where students outperform expectations, learning English (both content and skills) is a social activity with a depth and complexity of understanding that results from skillful conversations and interactions with others.

Class discussions—large group, small group, or online group—are chances for students to compare their thinking with others’. Teachers can provide support during group discussion by moving from group to group, modeling questions and comments that deepen the analysis, and encouraging the use of challenging questions that cause students to think deeply (Langer, 2000). As students begin to teach one another, they assume more responsibility for their own learning and for the learning of others in the class.

Over the years, specific structures and elements have been developed to foster the positive effects of social learning while avoiding the negative effects, such as uneven student participation. These structures are realized as cooperative learning, a subset of collaboration. A new research synthesis further supports the same positive effects found within many previous studies that looked at both academic and emotional outcomes of cooperative learning. Specifically, researchers who conducted a meta-analysis of 20 studies found the average effect size was 0.44 (Dean, Hubbell, Pitler, & Stone, 2012).

Of course, simply putting students into cooperative learning groups is not enough to improve learning. Understanding the following three implementation principles is key to making cooperative learning work:

1. **Teach group processing and interpersonal skills.** Skills that effective teachers model for students include making eye contact, asking probing or clarifying questions, using wait time effectively, and using summary statements as comprehension checks. How teachers and students respond to one another is also vitally important. Giving and receiving constructive criticism is a skill students can learn by focusing on the quality of the work, rather than on the individual, and by identifying in equal measure the strengths and weaknesses of another student’s work.

2. **Establish cooperative goal structures within groups.** One way teachers can establish cooperative goal structures in their classrooms is by linking outcomes among group members. Grades should not be considered outcomes; instead, an outcome can be as simple as the successful completion of an experiment.
3. **Provide mechanisms for individual accountability.** There are several ways to establish individual accountability. One technique is to keep groups small (i.e., three to five students). Small groups often police themselves since loafing by any single member puts larger burdens on the others. Another technique is to have groups determine nonredundant roles and responsibilities upfront. Each group member might learn a particular aspect of the lesson and teach it to teammates, or each may take on a particular role within the group, such as materials manager or timekeeper.

Intriguingly, brain imaging studies have shown that the amygdala, a portion of the brain associated with memory and emotions, is active and engaged when we learn new material. For example, students who struggle to solve a problem or deduce an answer independently will experience heightened anxiety and a reduction in the flow of new information. When working with others, however, the anxiety level is much lower and allows for free flow of information (Willis, 2007).

Lessened anxiety is one of the reasons cooperative learning groups are beneficial for ELLs. In addition, such groups “allow for the repetition of key words and phrases; require functional, context-relevant speech; and are ‘feedback-rich’” (Hill & Flynn, 2006, p. 56). Working in small groups not only provides ELLs with opportunities to speak but also requires them to adjust their meaning as they speak, so other members of the group comprehend what they are saying.

A Final Thought on the Knowledge Gear

Couple what we are now learning with what we have long known about reading, and the power of reading grows exponentially. Take, for instance, the results of a recent study in which researchers, who wanted to know what really happens inside people’s brains when they read fiction, examined brain scans and discovered that as readers encountered new situations, their brains captured the text and integrated it with their personal knowledge and past experiences (Speer, Reynolds, Swallow, & Zacks, 2009). Furthermore, the activated regions of the brain mirrored those involved when people see, perform, or imagine real-world activities. Such findings confirm that reading is anything but a passive process. Indeed, writer Nicholas Carr seems to agree; he describes a particular point many people experience when they become fully immersed in the reading matter and “the reader becomes the book” (2010, p. 74). That idea, in itself, is fascinating.

02

The Strategies Gear

“However beautiful the strategy, you should occasionally look at the results.”

—Winston Churchill

We think the National Reading Panel would agree with Churchill—they took quite a serious look at strategy instruction, and in their final report, they described it as being highly successful overall: “Readers acquire these strategies informally to some extent, but explicit or formal instruction in the application of comprehension strategies has been shown to be highly effective in enhancing understanding” (National Institute of Child Health and Human Development [NICHD], 2000, p. 14).

One of the seven questions guiding the research of the panel and its subgroups was *Does comprehension strategy instruction improve reading? If so, how is this instruction best provided?* To answer the second part of the question, panel members closely examined the findings of two major approaches: direct explanation (when a teacher explicitly explains the reasoning and mental processes behind a reading strategy) and transactional strategy instruction (when a teacher explicitly explains the thinking process and further emphasizes it by facilitating student discussions and collaboration). Among the panel’s salient findings is the revelation that teachers can learn these methods, but they need extensive formal instruction in teaching reading comprehension, modeling thinking processes, encouraging student inquiry, and keeping students engaged.

The larger message here is that all teachers can learn these skills, and content-area teachers must consciously plan to teach reading. This book contains several strategies to help you do just that. Before introducing and using these strategies in the classroom, however, we suggest discussing the benefits of strategy use directly with your students.

We know students are more motivated to learn when they recognize personal value in the material or lesson. Consequently, it's helpful to explain that all students can benefit from using reading strategies, especially if they have had trouble with reading comprehension in the past (Barton, 1997). As for students like Brian, our non-reading valedictorian from the introduction of this book, it can be best to address the issue directly, asking a student his or her reasons for not reading. If, for instance, students tell you they begin reading but eventually "get bored" and set the reading assignment aside, you might probe a little further. Alternatively, you could ask them to journal about their reading experience and identify the point at which they get bored. Together, you can then brainstorm some ways to continue reading. Through journaling, students gain insight into their reading hurdles, and teachers gain insight into their students' needs, whether it's for structured reading assignments or the need for greater variety in reading materials.

Instructional Frameworks

Instructional frameworks are particularly helpful tools that provide structure to teaching and the learning environment (Richardson, Morgan, & Fleener, 2009). Over the years, several such frameworks, all of which share similar assumptions, have emerged. Richardson and Morgan (1994) developed a simple three-phase framework for content reading instruction known as PAR, which stands for

- **Preparation:** Before reading, teachers motivate students by arousing their curiosity and need to know. In this phase, teachers should anticipate text problems and consider students' background knowledge.
- **Assistance:** During reading, teachers help students make connections and monitor their understanding. In this phase, teachers should select strategies that will guide students as they read and maintain their motivation to read.
- **Reflection:** After reading, teachers encourage students to reflect on the key concepts and ideas they read about. In this phase, teachers should provide students with thinking, talking, and writing opportunities in order to fully understand the material they are learning.

The PAR approach suggests that teachers incorporate learning activities at each stage and explain to students why each activity is essential for reading comprehension. For example, during the first phase, you might use techniques to activate and assess prior knowledge and to build background. During the second phase, you would select and model reading comprehension strategies for students. In the third phase, you might ask students to use the Learning Log strategy to encourage reflection on what they have read and how well they have understood it (see Strategy 16 in Part II). Alternatively, you could have students talk in small groups about the reading passage and why they think the

content is important to learn. Though all three PAR phases are important and should be completed, the second one—assistance—is the most critical in aiding student reading comprehension (Richardson et al., 2009).

Strategy instruction is particularly important for those students who are completely unprepared to read and understand printed text; invariably, there are always students who match this description. These students aren't likely to develop effective cognitive and metacognitive strategies on their own, so they need numerous opportunities to practice and apply the strategies you introduce. Of course, some students will already have and use some efficient strategies for learning a skill or given type of content. If students are confidently using strategies—but in ways that are different from how you might recommend—then allow them to continue using their methods. There is no reason to inhibit students' success if they have identified an approach that is comfortable and works for them.

After all, the ultimate goal of strategy instruction is independence. We want students to recognize which strategies work best for them in the different content areas, and we want them to practice those strategies until they can use them naturally while reading, much like this former Brockton High School graduate who is now in college: “You wouldn't think I'd still be using the literacy strategies I learned [at Brockton], but I am” (Murthy & Weber, 2011). Anything you do to foster this kind of independence will benefit your students.

In Part II of this book, we have categorized strategies according to when they are the most effective: before, during, or after reading. We've done this to reflect the underlying concept of PAR and other instructional frameworks that acknowledge learning occurs in phases. For example, one such framework refers to the three phases this way (Buehl, 1995; Costa & Garmston, 1994):

- Phase 1: Preactive thought, or preparing for learning
- Phase 2: Interactive thought, or processing that occurs during learning
- Phase 3: Reflective thought to integrate, extend, refine, and apply what has been learned

The preactive phase sets the stage for learning. During this phase, students prepare for learning by activating prior knowledge. They may preview a text to determine its organizational structure and identify which subject-specific reading skills might be needed; skim the text, prewrite about the topic, or mentally review what they already know; or identify a purpose for reading (e.g., to take away information or to imagine oneself as a character in an unfolding story) and approach the text with that purpose in mind. During this phase, students may also make predictions (see Strategy 20) and use anticipation guides (see Strategy 2).

During the interactive phase, learners are actively engaged in processing what they read. For example, while reading a social studies text, they select what they think is most

important—the main causes of the Cold War—and undertake some method to organize this information, such as chronologically ordering major events that led up to the Cold War. They evaluate their earlier predictions in light of new information read, revising them as needed. What Jones and colleagues (1987) term the “start/pause” nature of the learning process is especially evident during this phase. That is, readers monitor their comprehension and adjust their progress, sometimes rereading and reviewing material for clarification or developing a mental summary of what was read and evaluating new information in light of prior knowledge. Just as you might rewind a television show or movie and then rewatch a scene to make sure you understood it before moving forward, readers literally pause to think of questions, look back for answers to those questions, and think ahead to possible upcoming topics. Thus, although learning occurs in phases, it is not a neatly linear process.

Rather than simply describe the reflective phase, we’d like for you to do some reflecting of your own. Because you are an experienced reader, the three phases are probably second nature to you, and you may not even be aware that you are strategically processing information before you read, as you read, and after you finish reading. Take a few minutes to look over and answer the following questions. You might gain new insights into your own reading practices.

Reflective Questions for Strategic Processing

Before you begin a reading assignment, what do you do to develop a plan of action?

Do you

- Understand the purpose for reading the text selection?
- Ask yourself what you might already know about this topic?
- Preview the text by looking at headings, bold print, illustrations, graphics, and maps?
- Make any predictions about what this selection is about?
- Consider what skills you will need to read and comprehend the text?
- Think about how to eliminate any distractions that would impact your reading?

When you are reading, do you monitor your thinking by asking yourself the following questions?

- Does the information make sense to me?
- Am I revising my predictions as I read?
- Am I using a graphic organizer to take notes on important information as I read?

continued

- Am I asking questions or writing down questions to ask later?
- Am I looking for patterns in the text that will help me understand what I have read?
- Do I know what to do when I come to a word I do not understand?
- Do I stop and think about passages I have just finished?
- Do I think about my attitude and habits of mind as I am reading, and do I adjust them to successfully complete the work?

After you finish reading, do you

- Know if you learned what you were supposed to?
- Reread or review to seek clarity?

After you finish reading, are you able to

- Summarize the major ideas?
- Give your opinion of the selection?
- Discuss how the text supported your prior knowledge?
- Discuss how reading in this class is different from reading in other classes?
- Find more resources about this topic?

Source: From *Teaching Reading In Social Studies: A Supplement To Teaching Reading in the Content Areas Teacher's Manual* (2nd ed.) by J. K. Doty, G. N. Cameron, and M. L. Barton, 2003, p. 44. Aurora, CO: McREL. © 2003 McREL.

We encourage you to use these questions with your students and to lead a discussion about your own reading awareness, sharing what you've discovered about your reading behaviors. Because you will want students to use these questions while they read, this is a great opportunity to model how to use them. Using a think aloud, tell your students that you *always* preview the text and that you like to read acknowledgments and dedications when reading a book for pleasure because it helps you feel like you personally know the author, which heightens your interest. You might explain that you visit author websites and read online book reviews—all before you ever read a word in the book, which not only prepares you to read but also heightens your enjoyment once you begin reading and motivates you to continue reading. You might tell students that you read with a dictionary or computer nearby or that you use the dictionary feature on your e-book. You also might describe your frustration at not understanding a difficult passage and describe how rereading it helps you. Finally, you might explain that you'll read several books and articles on the same topic once you've gotten interested in it. Let's now take a closer look at the differences among the three phases or categories of strategies.

Prereading Strategies

Using prereading strategies in science, history, or mathematics classrooms can benefit all students—both those whose prior knowledge is well developed and those whose backgrounds are more limited. When students work together to apply prereading strategies, such as making predictions or creating concept maps, they learn from one another. For example, while using the PLAN strategy (see Strategy 19), students begin by creating a graphic organizer using titles and subtitles from a chapter. During the next step, they use check marks or other symbols to identify which concepts, names, and facts they already know something about. At this point, it becomes clear to students, whether they are working alone or in small groups, that their prior knowledge (as a group or on their own) is either strong or limited. By incorporating prereading strategies into your instruction, you not only help students access prior knowledge but also gain valuable information to use while planning further instruction.

When preparing your students to read, it's best to keep in mind that what seems straightforward to you may seem complex to them, especially if you have any students in your classroom with limited English skills. As students talk about what they already know, you should listen carefully to determine which students need a more thorough grounding in a specific topic before reading. In addition, prereading strategies can reveal whether the information students think they know is accurate. Studies show that readers who have misperceptions about a topic often do so because they have overlooked, misinterpreted, or didn't remember information that contradicted their preexisting—though incorrect—background information (Barton, 1997). Prereading strategies provide teachers with opportunities to correct misunderstandings before exposing students to new knowledge and ideas. For example, in the KNFS strategy (see Strategy 15), students first identify the facts they know from a mathematics problem they are trying to solve. Before moving on to the next three steps (identifying information that isn't relevant, asking what the problem wants them to find, and selecting a strategy to use to solve the problem), the math teacher can see whether students successfully identified information from the problem or if they transferred inaccurate information or faulty assumptions to the new problem.

When explaining to students the impact prior knowledge has on learning, you might also discuss how people's experiences shape perceptions and influence judgment. Literature, history, current events, and even television programs contain a wealth of illustrations—both comic and tragic—of how people's past experiences color the way they view the world. Students can reflect on times when their own background and experience caused them to misjudge another person, group, or situation. When students recognize that perceptions are not facts and that schema can be revised as they learn new information, they also recognize that they have the power to control what they think and learn.

Reader aids

Vision trumps all other senses. According to brain researcher John Medina (2008), when we receive information orally, we only remember about 10 percent of the content three days later. Pair that information with a picture, and we remember 65 percent of it. Thus, it is crucial that students inspect texts or reading selections before reading, looking for reader aids—pictorial, typographical, graphic, and structural elements that represent and reinforce content.

Reader aids aren't just limited to pictures and other graphics. They also include lists, maps, charts, sidebars (information that is adjacent to, but graphically separated from, the main content), and quotes. Previewing texts for reader aids reveals clues about important concepts and provides a mental framework for organizing ideas, which helps with retention and recall. For example, to prepare students for reading, you can ask them to locate and read sidebars that include author-provided questions or reading tips in the textbook. Frequently, such questions and tips appear as eye-catching, colorful graphics. Learning to pay special attention to bold print, heading size, italics, bulleted material, colored textboxes, and lists helps students become more effective readers (Ficca, 1997).

Science textbooks, in particular, can be problematic for students (Broughton & Sinatra, 2010). They commonly use lists to present related topics (e.g., plants, animals, cells) in a discrete manner. Although the topics are related, many textbooks fail to provide any supporting information to help learners connect them. A science text might provide a list and drawings of three types of protozoa, for example, but the language on the page may broadly describe microorganisms. If the relationship is not explicit in the discussion on the page, or if there is not a clear statement explaining that protozoa are single-celled organisms, students might not make the connection. For students who lack sufficient background knowledge, this approach practically guarantees they will not comprehend the main ideas of the text. However, if students outline a chapter using only the headings and subheadings or turn headings and subheadings into questions, then they are required to notice and work with text features before they begin reading. As they identify these types of reader aids, they recognize the simple concept that if a heading is bigger and more pronounced, it must be more important. Another conclusion they might reach is that lists appearing within the same section or chapter of a science text have something in common. This common feature can become a springboard for understanding new knowledge. A student might then ask whether the things discussed in that section or chapter are classified together, what type of classification system is used, and how that system can be applied to other material.

Regardless of what subject you teach—chemistry, business, history, or language arts—it is important to teach students not to skip over text features and reader aids. Emphasize the importance of this step by having students work together to paraphrase graphics from the textbook before they read the relevant section or chapter. Alternatively,

as a way of broaching the topic of being a savvy reader, you might ask students to complete the Metacognitive Reading Awareness Inventory (see Appendix A). One way to think about this inventory is as an informal data collection tool or formative assessment. Once students answer the questions, they could work in pairs or small groups to analyze the results and then, as a whole group, create a chart that shows the most popular responses. Identify students' responses that are different than the suggested ones, then solicit and discuss possible reasons why they might be different. Students can then write a summary of the results along with their explanations, and the class could develop an action plan to address needed areas of improvement.

Vocabulary

Vocabulary is terminology the author uses to express ideas and concepts. Robert Marzano (2003) conducted a meta-analysis of influences affecting student achievement, and he noted that much of the variance was attributable to three broad factors: home environment, background knowledge, and student motivation. Vocabulary is a pivotal component of a student's background knowledge, and research indicates direct instruction in vocabulary can effectively increase background knowledge in the content areas (Dean et al., 2012; Stone & Urquhart, 2008). Moreover, vocabulary instruction has been shown to play a major role in improving comprehension (Laflamme, 1997). Even though each content area has its own unique vocabulary or lexicon, there are many all-purpose words used within and across disciplines. These include words for thinking (*hypothesize, evidence, criterion*), classifying (*vehicle, utensil, process*), communicating (*emphasize, affirm, negotiate*), and expressing relationships (*dominate, correspond, locate*). So-called Tier Two words, which are useful across content areas and in many learning situations, "are high-frequency words for mature language users—*coincidence, absurd, industrious*—and thus instruction in these words can add productively to an individual's language ability" (Beck, McKeown, & Kucan, 2002, p. 16). By contrast, Tier One includes basic words (e.g., *baby, clock, happy*), and Tier Three includes content-specific words (e.g., *peninsula, habitat, metamorphic*).

Beyond the all-purpose words, however, is terminology that distinguishes disciplines, particularly labels that identify important content-area concepts—the Tier Three words. Armbruster and Nagy (1992) identify three aspects of content-area vocabulary that differentiate it from vocabulary used in literature-based lessons. First, content-area vocabulary often consists of words for major concepts that undergird a lesson or unit; therefore, it is critical students have a clear understanding of what these concepts mean. A student who cannot explain the meaning of *perspective* after an art lesson on that drawing technique has failed to grasp an essential portion of the lesson. By contrast, if a student does not understand a word such as *desultory* in a short story, his or her understanding of the story might not be affected. Second, content-area vocabulary is rarely associated with concepts that students already know. For example, a student who encounters the word

photosynthesis for the first time while reading a science text is confronting an entirely new concept. Without prior knowledge, the student has no context for understanding the word, and nothing in his or her experience can provide a synonym or related idea. Third, content-area terms are often semantically related. Students studying a unit on weather might encounter the words *cirrus*, *cumulus*, and *stratus*. How thoroughly a student understands the concept of cirrus clouds will affect what he or she understands cumulus clouds to be.

Students in the upper elementary grades and beyond encounter more than 10,000 new words, most of them multisyllabic, in content-area texts each year (Nagy, Berninger, & Abbott, 2006). Therefore, content-area teachers must incorporate systematic vocabulary instruction into their planning and instruction. Content-area vocabulary words often represent major concepts in a unit, so instruction needs to go beyond simple definitions. Many teachers would like to do more vocabulary instruction in their content-area classrooms but are unsure about how to tackle it. Prereading vocabulary strategies can help students learn the meaning of new concepts and recognize the connections between and among them. Rote memorization, on the other hand, will not provide students with any practical means of making logical connections.

Even though it is a common practice to preteach vocabulary at the beginning of a unit of study, researchers disagree about whether vocabulary terms should be taught prior to, during, or after students' exposure to text passages that contain them. Several studies have shown that intensive preteaching of vocabulary can improve comprehension (e.g., Blachowicz & Fisher, 2000; Harmon, Hedrick, & Wood, 2006; Laflamme, 1997; Merkley & Jeffries, 2000/2001). Others advocate teaching target vocabulary during or after reading: "An important goal of content area lessons is to help students learn how to learn from reading so that they can independently acquire information from text" (Armbruster & Nagy, 1992, p. 550). Both viewpoints have merit, and we suggest you experiment with each to find what works best for your students. One place for you to start is with the standards and benchmarks for your discipline, mining them for key terms that students must understand in order to grasp the content.

Students learn content-area vocabulary best through first-hand, purposeful interaction with the relevant concepts. Whenever possible, students should hear, read, and be exposed to the terms they are expected to learn and use. In addition, students should be exposed to new terms through contrived experiences such as demonstrations, field trips, and audiovisual examples. The most important thing a teacher can do is ensure direct instruction of academic terms and ample opportunities to use them. For students to gain a thorough understanding of technical concepts, teachers need to provide multiple opportunities for students to learn how the relevant vocabulary is conceptually related (Vacca & Vacca, 1993).

Marzano and Pickering propose the following six-step process for teaching content-specific vocabulary:

- Step 1: Provide a description, explanation, or example of the new term.
- Step 2: Ask students to restate the description, explanation, or example in their own terms.
- Step 3: Ask students to construct a picture, symbol, or graphic representing the term.
- Step 4: Engage students periodically in activities that help them add to their knowledge of the terms in their notebooks.
- Step 5: Periodically ask students to discuss the terms with one another.
- Step 6: Involve students periodically in games that allow them to play with terms.
- (2005, pp. 14–15)

Of course, you will not be able to teach every unfamiliar word students might encounter in their texts, so when you develop a unit and identify concepts on which you will focus, consider using an activity, such as the one that follows, that requires students to preview text and select their own words. Working in teams, students develop a list of unfamiliar terms they predict will be crucial for understanding the focus of the upcoming unit. They should be able to defend their lists and explain why they chose each term. The teacher then modifies the list by deleting terms deemed less important and adding terms students overlooked, clearly explaining his or her reasons for making these changes so students understand how to identify the most important terms. After vocabulary terms are agreed upon, content-area teachers need to determine which strategies will offer their students the best insights into concept meanings and the relationships among concepts.

During-Reading Strategies

To illustrate the benefits of teaching students to strategically tackle their texts, you might ask them to draw comparisons between textbook features and facial features. Just as a nose, eyes, or lips can distinguish one person from another, certain aspects of a page of text can differentiate it from others. Text features, literary devices, and word choice not only make printed pages unique but also significantly affect comprehension:

- Printed instructions for the assembly of a child's bicycle are much easier to comprehend if they are accompanied by detailed diagrams.
- Research articles in scientific and medical journals can be confusing to the average person because they contain specialized, technical terminology.
- A novel that jumps among settings and timeframes is harder to follow than one written chronologically.

Students need to recognize such features in their textbooks and understand that they vary from one content area to another. For example, mathematics textbooks require students to use math-specific reading skills, such as decoding symbols in an algebraic

equation. The Common Core State Standards for Mathematics gives equal weight to the content standards—which include such concepts as number and quantity, algebra, and geometry—and the eight standards for mathematical practice, which describe what students must learn to do and whose aim it is to deepen students' understanding:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning. (Kendall, 2011, p. 24)

For students to learn mathematics and be able to express their understanding of mathematical concepts, they must know how to use the various reader aids throughout their textbooks—diagrams, examples, and sidebars—as tools for learning. To anticipate and be prepared to assist students with any problems they may have with these unique features of their textbooks, take a step back from your area of expertise and imagine you are a student with relatively limited knowledge of the material. By “thinking like a student,” you might see various terms in chapter and section headings and realize that your students will need direct vocabulary instruction on these key words before reading. You might then select a categorization strategy such as Concept Circles (see Strategy 7) to help them make connections among the terms they will be learning. By looking at the mathematics textbook (which you probably know inside and out) with fresh eyes, you can better determine how to help students learn the reading skills they need to comprehend their assignments. You might even return to the Reflective Questions for Strategic Processing on pages 13–14 and try to answer those questions as your students might.

Figure 2.1 presents an example of a lesson that prepares students to better understand the features of a mathematics textbook, along with a sample list that students might create to post as a classroom reference.

Educators generally agree that once a student leaves high school, most of his or her reading will be informational reading, and much of it will be on complex or specialized topics. “Entry-level jobs today often have higher reading requirements than many of the more advanced positions in the same field” (Daggett, 2003, p.4). Work-related reading materials are diverse and include manuals, books, newspapers, journal articles, instructions and directions, and white papers, all of which are classified as expository (or informational) text. Preparing students to read and understand expository text seems like a reasonable expectation of our educational system. Nevertheless, the Carnegie Corporation points out that there still exist some very real reading challenges for middle and high school students, as seen in Figure 2.2 (Lee & Spratley, 2010).

FIGURE 2.1 → Sample Lesson for Understanding Reader Aids in Mathematics Textbooks

Getting Ready to Read

Analyzing the Features of a Mathematics Textbook

A well-designed textbook has a variety of features, or reader aids, that help organize main ideas, illustrate key concepts, highlight important details, and point to supporting information. Readers who understand how to identify and use these tools spend less time trying to unlock the text and more time concentrating on the content.

In this strategy, students go beyond previewing a textbook to analyzing and determining how its features help them find and use information for learning. They can use the same strategy with magazines, e-zines, newspapers, e-learning modules, and other reading materials.

Purpose(s)

- Familiarize students with the main features of their textbook so they can find and use information more efficiently.
- Identify patterns in longer texts.
- Create a sample template of reader aids to post in the classroom for reference.

Tips

- Text features (i.e., reader aids) may include headings, subheadings, table of contents, index, glossary, preface, paragraphs separated by spacing, bulleted lists, sidebars, footnotes, illustrations, pictures, diagrams, charts, graphs, captions, italicized or bolded words or passages, color, and symbols.
- Provide students with an advance organizer to guide them as they read (e.g., a series of prompts that ask students to preview particular features and note how they are related to the main body of the text).
- Teach students the SQ3R strategy (see Strategy 29).
- Model how students can use the features of computer software and Internet websites to help them navigate and read the program or site (e.g., URLs, pop-up menus, text boxes, buttons, symbols, arrows, links, color, navigation bar, home page, bookmarks, graphics, abbreviations, logos).

What Teachers Do	What Students Do
<p>Introduce the activity:</p> <ul style="list-style-type: none"> • Ask students to recall a magazine or informational book they recently read, or a website they recently viewed. Ask them to describe how the text looked and how they found information. Ask them what they remember about the content, and why they think they could locate and/or remember the information. 	<ul style="list-style-type: none"> • Recall something recently read or viewed and identify features of that particular selection, making connections between what they remember and the features.

continued

What Teachers Do	What Students Do
<p>Introduce the activity:</p> <ul style="list-style-type: none"> • Provide copies of a text to every student. • Organize students into groups of 3 to 5, assign two different sequential chapters to each group, and ask students to scan the chapters, noting both similar and different features. • Groups record their findings on chart paper (e.g., point-form notes, Venn diagram, compare/contrast chart). • Ask each group to send an “ambassador” to the other groups to share one thing they discovered, trading it for one thing the other group discovered before returning to their original group. 	<ul style="list-style-type: none"> • Quickly scan two chapters, and note similarities and differences of their text features. • Contribute to the group discussion and chart-paper note taking. • Share findings with other groups and their base groups.
<p>During the activity:</p> <ul style="list-style-type: none"> • Remind students that textbooks have many different elements or features to help them learn the material, and ask each group to report about the features of their text. • Create a textbook or chapter template on chart paper, indicating the common features and noting any unique features (see <i>Features of a Mathematics Textbook—Sample Class Template</i>). 	<ul style="list-style-type: none"> • Share the group’s findings. • Contribute to the class template.
<p>Following the activity:</p> <ul style="list-style-type: none"> • Assign a relevant reading task to small groups of students for practice using reader aids to locate information and help them understand and remember what they read. • Encourage students to use the template to make predictions about where they might find information. • Discuss how this strategy also helps navigate websites, e-zines, and online media. 	<ul style="list-style-type: none"> • Use reader aids to complete the assigned reading task, noting those that help them locate, read, understand, and remember information. • Refer to the template for future reading tasks. • Recall how they have used features of electronic texts to find, read, and help understand information.

Features of a Mathematics Textbook

Sample Class Template

Textbook Title: *Doing Mathematics*

Table of Contents: A list of the topics and subtopics in each chapter.

Chapters: These group big, important mathematical ideas.

Chapter Introduction: A brief overview of the important mathematics in the chapter and the curriculum expectations. The Chapter Introduction also poses a problem that can be solved by applying the mathematical concepts in the chapter.

Skill Review: Provides review material for mathematical skills learned in earlier grades. Proficiency with these skills is an aid to doing the mathematics in this chapter.

Chapter Sections: Focus on a smaller part of the important mathematics in the chapter. They usually include a “Minds On” activity, information and examples about the key mathematics in the section, and a brief summary of the key ideas and practices questions. There are 3–15 sections in each chapter.

Chapter Review: A summary of the mathematics in the chapter, additional examples, and extra practice questions that connect the mathematics in each section of the chapter.

Chapter Review Test: A sample test that you can use to self-assess your understanding of the mathematics in the chapter.

Cumulative Review Test: A sample test that you can use to self-assess your understanding of the mathematics in several consecutive chapters.

Technology Appendix: This section has specific instructions for graphing calculators, CBRs, spreadsheets, Fathom, and The Geometer’s Sketchpad. Technology icons throughout the chapter indicate this appendix contains more detailed instructions.

Icons: Technology, career, and math history icons that help quickly locate related text.

Answers: Answers to most practice questions, review, and review tests appear in the back of the textbook.

Glossary: An alphabetical listing of the new terms introduced throughout the textbook; italicized words in the text also appear in the glossary.

Index: A quick way to look up specific information or concepts using page references.

Source: From *Think Literacy: Cross Curricular Approaches, Grades 7–12*. Government of Ontario: Queen's Printer for Ontario. Copyright 2005 by Queen's Printer for Ontario. Adapted with permission.

Looking over the third column (Challenges to Comprehension), you may have been struck by how demanding reading really is for students, and for those students who are struggling, it can be daunting. The unspoken assumption among educators is that most students are proficient readers once they enter middle school, but it is evident that this is not the case (SEDL, n.d.; Shanahan & Shanahan, 2008). Unfortunately, few middle or high school students have the opportunity to sign up for a reading course. Miller (1997) notes that the science and social studies textbooks selected for a grade level are often above the reading level of many students in that grade. Similarly, an examination of mathematics textbooks reveals that even though the mathematical concepts may be grade-level appropriate, the reading level can be one, two, or even three years above grade level (Braselton & Decker, 1994; Lamb, 2010).

Who, then, could argue that teaching reading is solely the purview of English teachers? That belief has not served students well in the past, and it certainly won't serve them well in the future. Cross-curricular approaches to literacy, however, will.

Before asking your students to use any of the During-Reading strategies provided in Part II, you may want to intentionally introduce them to the concept of text structures—organizational patterns authors employ to express ideas.

In any discipline, a key concept for students to know and understand is that authors use expository text to organize information in several ways. One way effective readers construct meaning from a text is by identifying the most important information and organizing all of the ideas into a mental pattern or sequence that makes sense. Just as authors intentionally select a particular organizational pattern to best convey their ideas, readers can learn to look for one of these common organizational patterns: sequence, comparison/contrast, concept/definition, description, episode, generalization/principle, process/cause–effect (Marzano et al., 1997). Students who are familiar with these patterns are more likely to comprehend what they read because they use their knowledge of text structures to

- Locate information in the text.
- Differentiate between what is important and what is unimportant.
- Mentally sequence information in a logical order.
- Synthesize ideas that appear in different locations in the text or from a number of texts.
- Link new information to what is already known.
- Restructure and revise prior knowledge to account for new information.

The successful reader is familiar with different ways to organize information, able to recognize different organizational patterns, and able to impose patterns while reading. This is true of both informational and narrative text. A knowledge of organizational

FIGURE 2.2 → Characteristics and Challenges of Content-Area Texts

Content Area	Text Types and Characteristics	Challenges to Comprehension
Science	abstracts, section headings, figures, tables, diagrams, maps, drawings, photographs, reference lists, endnotes, complex technical terms	Requires <ul style="list-style-type: none"> • visual literacy, mathematical literacy, or an ability to understand mathematical tables and figures • extensive knowledge of meanings of technical terms
History	political and legal documents, newspaper articles, letters, diaries, primary and secondary sources, published proceedings, cartoons, photographs, density of ideas, ambiguous references	Requires <ul style="list-style-type: none"> • the ability to logically connect ideas and infer relationships • the ability to understand motivations for actions and reactions • the ability to connect causes, events, and consequences
Literature	fiction, science fiction, biography, autobiography, short story, novel, poetry, drama, allegory, fable, myth, mystery	Requires <ul style="list-style-type: none"> • knowledge of rhetorical tools (e.g., symbolism, irony, satire, point of view) and genres • the ability to compare and contrast among texts and understand character types
Mathematics	mathematical notation, stipulated definitions, examples of theorems and proofs, technical language, syntax, logic	Requires <ul style="list-style-type: none"> • mathematical modeling, repeated practice, and real-world examples

patterns can exist both “inside the head” as a conceptual framework and “outside the head” in printed text. Text type and purpose often determine organizational structure. Content-area teachers can help students improve their reading comprehension by teaching the organizational patterns typically used in each, how to recognize those patterns, and the kinds of questions each pattern is intended to help answer.

The early work of Anderson and Armbruster (1984) suggests that textbook organization is either considerate or inconsiderate, and a more recent look at this idea also

emphasizes the need for coherent text structures in classroom texts (Richardson, Morgan, & Fleener, 2009). Considerate text is easier to read because it is well organized and clearly written. Signal words cue readers to the author's organizational plan, and ideas appear in a logical sequence. By contrast, inconsiderate text is difficult to read because it is poorly organized and poorly written. The organization of ideas does not match the author's purpose, the sentence structure is complicated, and the vocabulary often is too difficult for the intended audience. When text is inconsiderate, students can rely on their knowledge of organizational structures to help them grasp the content.

Students benefit from being able to recognize a text's organizational pattern because they are able to read the information with specific questions in mind. That is, each organizational pattern suggests a series of questions that are answered within the text. Answering these questions helps students comprehend the intended message. Skilled authors incorporate certain signal words, linking expressions, or transitions that connect ideas. In order to identify different text patterns, students need to be able to recognize these signal words and transitions as clues.

Typically, expository text is written to inform or persuade, and the ideas expressed are usually organized in one of the following seven organizational patterns (see also Strategy 12) (Marzano et al., 1997).

1. **Sequence:** Organizes events in a logical sequence, usually chronological. **Signal words:** *after, afterward, as soon as, before, during, finally, first, following, immediately, initially, later, meanwhile, next, not long after, now, on (date), preceding, second, soon, then, third, today, until, when*
2. **Comparison/contrast:** Organizes information about two or more topics according to their similarities and differences. **Signal words:** *although, as well as, as opposed to, both, but, compared with, different from, either, even though, however, instead of, in common, on the other hand, otherwise, similarly, still, yet*
3. **Concept/definition:** Organizes information about a word or phrase that represents a generalized idea of a class of people, places, things, or events (e.g., dictatorship, economics, culture, mass production). Concept/definition text defines a concept by presenting its characteristics or attributes. **Signal words:** *for instance, in other words, is characterized by, put another way, refers to, that is, thus, usually*
4. **Description:** Organizes facts that describe the characteristics of specific people, places, things, or events. These characteristics can appear in any order. **Signal words:** *above, across, along, appears to be, as in, behind, below, beside, between, down, in back of, in front of, looks like, near, on top of, onto, outside, over, such as, to the right/left, under*
5. **Episode:** Organizes a large body of information about specific events, including time and place, people, duration, sequence, and causes and effects of particular

events. **Signal words:** *a few days/months later, around this time, as it is often called, as a result of, because of, began, when, consequently, first, for this reason, lasted for, led to, shortly thereafter, since, then, subsequently, this led to, when*

6. **Generalization/principle:** Organizes information into general statements with supporting examples. **Signal words:** *additionally, always, because of, clearly, conclusively, first, for instance, for example, furthermore, generally, however, if . . . then, in fact, it could be argued, that, moreover, most convincing, never, not only . . . but also, often, second, therefore, third, truly, typically*
7. **Process/cause–effect:** Organizes information into a series of steps leading to a specific product. Organizes information in a causal sequence that leads to a specific outcome. **Signal words:** *accordingly, as a result of, because, begins with, consequently, effects of, finally, first, for this reason, how to, how if . . . then, in order to, is caused by, leads/led to, may be due to, next, so that, steps involved, therefore, thus, when . . . then*

Expert readers not only recognize these patterns but also use them to impose meaning on text. For example, a reader might recognize text written in a descriptive pattern yet select a comparison/contrast pattern to frame the selection, thereby “making meaning” by connecting the new information to something familiar. Another advantage of text structure knowledge is that when textbooks are not well organized (and some of them are not), skilled readers are able to impose a structure of their own to organize the information into something that makes sense to them. Thus, organizational patterns can exist both on paper and in the mind of the reader (Jones et al., 1987).

One way to teach students about organizational patterns is to tackle them one at a time, through a series of minilessons. Here are some possibilities:

- Activate students’ prior knowledge of text structure and organization by posing a problem for them to solve. Examples include: How would you explain to your grandparent how to set the alarm on his or her cell phone? How would you teach your little brother or sister to dribble a basketball? How would you convince your parents to give you a credit card? After they share their responses, students should be able to explain how they organized their ideas and why they chose that particular approach.
- Introduce one of the organizational patterns used in expository text; explain its characteristics; and identify when and why writers use that pattern, related signal words, and any questions the pattern typically answers. Provide an example of the pattern in the textbook or another familiar book. Trade books offer in-depth information on a variety of content-area topics and often organize information more logically and coherently than content-area textbooks (Moss, 1991, 2004).

Model how to tell whether the example meets the criteria for the identified organizational pattern.

- Provide a graphic organizer for mapping out the information in the organizational pattern and demonstrate how to fill it in. Explain that a visual representation of a text's organizational pattern often aids comprehension and retention. Ask students to locate another example of this pattern in the textbook, a newspaper, a magazine, an online article, or a trade book. Students can then use a graphic organizer to organize the information in their selected example.
- To reinforce understanding, have students write paragraphs using the appropriate pattern. When readers write and edit different types of expository text, they improve their reading comprehension of content-area textbooks (Denti & Guerin, 2008; Raphael et al., 1988). Using a graphic organizer as a visual map, students can write rough drafts and add signal words where appropriate. Students can then edit one another's paragraphs, revise their drafts, and write a final copy.

After-Reading Strategies

Have you ever been asked to speak on a topic that you sort of—but don't really—know much about? Like most of us, you probably know a great many things (facts, anecdotes) on a superficial level, which is certainly adequate for friendly conversation, but not at an in-depth level where you could easily teach it to others and anticipate listener's questions. If you haven't said "I don't really know something until I teach it" at least once in your teaching career, we bet you know someone who has. The idea, of course, is that to thoroughly understand something, you have to use what you have learned about it, and to use it, you have to process that knowledge at deep levels. In turn, you must give yourself time to reflect on it, perhaps write about it, and try to apply it to various new situations. When you think of the role of reflection this way, it's easy to see why it is important for students to reflect on their reading.

Effective readers are rarely finished reading once they've closed their textbooks. They reflect on what they've read, and they

- Analyze how the material aligns with their prior knowledge and experience, measuring it against what they believe, what they know, and what they have experienced.
- Make inferences and draw conclusions about what they read.
- Revise their schema as needed, incorporating new learning into their knowledge base.

- Extend and refine what they have learned, deepening their understanding of the material.

Reflection activities you might ask students to do, such as writing in a journal or in response to a question you wrote on the board prior to reading, are ways for students to process what they've read. Although you may only invest a few minutes of class time on reflection activities, the reward—that students become aware of their new learning—is worth it. Reflection doesn't always have to be shared, though it can be affirming for students to discover that they are not alone in their perceptions or that classmates find merit in their thinking, but it should have a future outlet, perhaps in a later discussion when you call on students to think back to the assignment and recall their reflections. We suggest that you plan to include reflection activities in the majority of your lesson plans. For students to effectively use strategies, you must provide opportunities for them to exercise choice, execute deliberately, and reflect on their learning (Alexander, Graham, & Harris, 1998).

Reflective conversation

At one point or another, we've all found ourselves a bit embarrassed when someone has caught us talking to ourselves while thinking through a problem or issue. Reflective thought is not unlike having a conversation with oneself; it is an integral part of all learning. Successful readers reflect on what they read, which helps deepen their understanding of the text as a whole. Reflection also helps readers synthesize what they have read and integrate new learning into their existing schema. The intent of reflective conversation is to help students become ideal readers, but having reflective conversations in classrooms is less common than you might think. Similar to metacognition and metacomprehension, a reflective conversation can occur anytime during the reading process—before, during, or after.

When you first pick up a nonfiction book, all the information you really have is a title and an author's name, yet that often is enough to prompt reflection. Have you read this author before? If so, how do you feel about reading something else he or she has written? Are you dreading the task because the language is so dry, the vocabulary so academic, and the organization so confusing, or are you anticipating reading a fast-paced, fact-based story that reads like a novel because the author so skillfully reconstructs historical events and logically ties them all together? By reflecting on your own experiences, you can understand how students feel when assigned a mathematics or science text to read. Some of them might dread the idea of reading it because of their previous experiences with content-area reading, whereas others might have had positive experiences in the past and enjoy reading at many levels. Of course, most students will be somewhere between those two extremes.

We suggest allowing students to share their previous reading experiences with one another in small groups and in whole-group settings. Early in the year, for example, you

might create a reading habits survey, asking questions about past experiences. Where do they like to read? What was the last book they read? What reading materials do they keep around? Alternatively, you might simply ask students to rate themselves as readers on a scale of 1–5 (with 5 being a diehard reader!) and then share the results with the entire class.

While reading, students stop to reflect on their progress, thought processes, and perceptions of their own behavior (e.g., what they had to reread, what they skimmed). They also might indicate where they are in their reading and set goals for pages read by a designated day, describe their thinking up to that point and reflect on whether it is changing, and define alternative reading strategies they intend to pursue to complete an assignment while fully understanding the material. These practices increase students' awareness of their behavior and allow them to adjust accordingly. After reading, students can evaluate how well they read and understood the selection, how productive the strategies were, and whether alternative strategies would be more helpful in the future.

Of course, learning—for both student and teacher—is the overall goal of a reflective conversation. Reflective conversation requires teachers to use nonjudgmental verbal behaviors such as silence, acceptance, and clarification. When you take on the role of a reflective coach, you should wait silently after asking a question, providing students with ample wait time to respond. Teachers often wait only one or two seconds after asking a question before asking another one or giving the answer. By waiting, you communicate respect for the student's reflection and processing time.

Science teachers Jennifer Smith and Cynthia Martin emphasize the importance of a teacher's use of wait time for questioning to be effective: "Wait time 1 (a 3+ second pause provided after a question is asked) provides students time to contemplate the question and develop an answer. Wait time 2 (an additional pause provided following a student response) encourages more student responses and elaboration of previously offered ideas. The initial discomfort felt by students and teachers during wait time is often necessary to draw out student responses and ideas, and is essential to the discussion process" (2007, p. 18).

When you do respond to students, it should be in the form of a nonjudgmental acceptance. You might paraphrase by repeating, rephrasing, translating, or summarizing what students say. For example, "You're saying the selection is about. . ." Maintaining the intent and accurate meaning of what students say is important. The paraphrase is possibly the most powerful of all nonjudgmental verbal behaviors because it communicates the idea that "I'm attempting to understand you," which, in turn, says "I value you" (Costa & Garmston, 1994). Willingly listening until a student has finished speaking and using open-ended questions communicate that you are a sensitive and attentive listener.

Another option is to clarify a student's response. Clarifying indicates that you do not understand what the student is saying and you need more information. For example, "Please expand on what you mean by 'gas-permeable.' I'm not sure I understand." The intent of asking clarifying questions is to better understand the student's ideas, feelings,

and thought processes. Clarifying contributes to trust because it sends the message that students' ideas are worthy of exploration and consideration (Costa & Garmston, 1994).

Once students learn about and practice how to “listen to hear,” to paraphrase what’s been said, and to ask nonjudgmental questions, they can effectively combine these strategies and conduct a reflective conversation. It is then that they will have learned how to learn.

A Final Thought on the Strategies Gear

Effective readers are amazing strategists. They attack the material by consciously making a plan before they begin, they monitor what they read during the process, and they evaluate how well they understood the selection once they finish. On one level, they are actively engaged with the content, making mental notes about important concepts, revising predictions, answering questions, and noting main and subordinate ideas. On another level, they are observing and assessing their attitude toward the task and their reading style and whether each is helping accomplish the purpose. They adjust their attitude and style as needed to improve comprehension—perhaps slowing their pace, restraining any impulsive desire to stop reading, redirecting their focus, or selecting fix-up strategies (e.g., rereading confusing selections and examining the context of unfamiliar words to ascertain meaning). They summarize the text’s main ideas, and if needed, they reread or review certain selections. They appraise their learning in terms of their original purpose, and they strategize how they might demonstrate their understanding if asked to do so. We think that’s pretty awesome!

Just as awesome is a teacher who is purposeful and thoughtful about planning instruction. Unfortunately, studies reveal that teachers devote most of their time to presenting new content, which does little to prepare students to read text assignments or internalize what they read (Meltzer, 2001; Wood & Muth, 1991). Instead, teachers should teach students how to prepare for learning through prereading activities, ensure comprehension through the use of metacognitive strategies during reading, and extend and refine the new knowledge they acquire.

Teaching strategically means analyzing how every aspect of a lesson contributes to the instructional goal or objective. It means selecting teaching and learning strategies that enhance student learning, and it means helping students acquire the skills they need in order to be self-directed, independent learners. Content-area teachers can accomplish this by sharing a variety of strategies with students, by explaining their value, and by repeatedly modeling and having students practice these behaviors. In this way, students learn the content they need to master and how to read effectively. Ultimately, though, they come to value reading. (With this in mind, Appendix B presents a 10-point checklist to assist in your strategic planning.)

03

The Goals & Dispositions Gear

“The secret to high performance isn’t rewards and punishments, but that unseen intrinsic drive. The drive to do things for their own sake. The drive to do things ‘cause they matter.”

—Daniel Pink, *Drive: The Surprising Truth about What Motivates Us*

Daniel Pink, a career analyst, studied the science of human motivation before writing and speaking about the gulf that exists between “what science knows” and “what business does” about motivating workers. Specifically, he credits social science with revealing the truth about using contingent motivators (i.e., telling someone “if you do this, then you will get that”) for 21st century tasks: not only do they not work, they often cause harm (Pink, 2009a). Pink argues that the best approach revolves around three elements: autonomy, or the urge to direct our lives; mastery, or the desire to get better and better at something; and purpose, or the longing to do something that relates to a greater purpose. He proposes these as the building blocks of 21st century business. It then follows that they should also be the building blocks for 21st century education.

To understand what is unique about 21st century education, we should begin with a look at the “then” and “now” of educators’ views on reading and learning. Figure 3.1 provides a convenient look at just a few of the ways that education has changed.

Developing Goal-Directed, Motivated Learners

Throughout the past couple of decades, as offices transformed into cubicles and conference rooms became collaboration rooms, schools began to reflect the larger cultural influences

FIGURE 3.1 → Our Changing Views of Reading

Reading is . . .	A Fixed Ability (traditional view)	A Dynamic Relationship (new definition)
<i>Research base:</i>	<ul style="list-style-type: none"> • Behaviorism 	<ul style="list-style-type: none"> • Cognitive science
<i>Goals:</i>	<ul style="list-style-type: none"> • Focus on mastery of isolated facts and discrete skills. • Meet stated achievement goals. • Study and learn information. 	<ul style="list-style-type: none"> • Focus on self-awareness and regulation. • Move toward deeper understandings. • Make meaning within a discipline.
<i>Classroom expectations:</i>	<ul style="list-style-type: none"> • Rote memorization. • A single instructional approach. • Teachers ask questions with predetermined answers. • Broad content coverage. 	<ul style="list-style-type: none"> • Reading as an interaction among the reader, text, and context. • Students experiment with multiple problem-solving approaches. • Students grapple together with ideas. • Students use reading and writing to access complex disciplinary content.
<i>Learner experience:</i>	<ul style="list-style-type: none"> • Passive process. • Knowledge relies on external sources. • Students work alone answering superficial questions. • Discussion is based on teacher prompts. • Students drill on subskills of reading. 	<ul style="list-style-type: none"> • Active and social process. • Students know and use strategies; make connections across lessons, classes, and grades; and apply vocabulary, comprehension, and study skills. • Students regularly engage in discussion and conversations. • Discussion is a learning tool for stimulating thinking and helping students extend and refine their understanding of the content. • Support is differentiated to meet individual student needs.

continued

FIGURE 3.1 → Our Changing Views of Reading (*continued*)

Reading is . . .	A Fixed Ability (traditional view)	A Dynamic Relationship (new definition)
<i>Assessment:</i>	<ul style="list-style-type: none"> • Test preparation is set apart from regular class time. • Students regurgitate facts from text. • Teachers check to see if students have learned what they “should have” learned. 	<ul style="list-style-type: none"> • Test preparation is integrated into class time as part of ongoing learning goals. • Activities clarify, reinforce, and extend knowledge.

and changes in the workplace. Once a passive and solitary experience for students, learning has become social, collaborative, and, at times, customized to reflect societal changes and what cognitive science has revealed about how we learn.

Today’s business environment isn’t a place for graduates who are good at only one thing. Of course we want students to be good mathematicians, scientists, linguists, and historians. Nevertheless, they also need to be strong communicators who can think critically about problems and issues, express ideas fluently in writing and speech, and adapt to a variety of work environments. “In today’s knowledge-based society, our students need to be expert readers, writers, and thinkers to compete and succeed in the global economy” (Kamil, 2003, p. 30).

As we’ve discussed, readers read for different purposes—sometimes for pleasure and sometimes for information. Wherever students find information—be it online or in a textbook—their goal remains constant: *learning*. Teaching reading in the content areas means more than learning the content relevant to each discipline; it also means helping students think as if they were members of the discipline’s community of experts and learners. This is one reason why it is so important to communicate explicitly what students should learn by verbally stating learning objectives, displaying them in writing, and calling attention to them throughout a unit or lesson. In 2010, McREL completed a study that demonstrated the positive impacts that setting objectives and providing feedback can have on student achievement (Dean et al., 2012).

Two sets of goals are better than one

Fundamental to goal setting is the process of establishing direction and purpose. Research on cognition (the mental process of acquiring knowledge) and on metacognition (the act of thinking about and controlling one’s thinking process) reveals that learners have two goals: to understand the meaning of learning tasks (often referred to as constructing meaning) and to regulate their own learning (Center for Development and Learning, 1997; Jones et al., 1987).

For students, goal setting is a way to focus on what's important to learn, and as we've mentioned before, taking charge of their learning is a new idea for many students. To increase their comfort level with this process, help students understand that you regularly set instructional goals while planning units of instruction by modeling your own process. Similarly, students will learn to write personal learning goals related to those instructional goals. Since instructional goals are relatively narrow, take care not to set goals that are too specific, otherwise students may ignore information that is not directly related to the goal and thereby limit their learning (Dean, Doty, & Quackenboss, 2005). When you develop instructional goals, keep in mind that you will be asking students to write their learning goals based on the instructional goals you identify. Therefore, you want your instructional goals to be specific enough to guide students yet still flexible enough for them to set their own learning objectives, as illustrated in Figure 3.2.

FIGURE 3.2 → Levels of Specificity in Learning Objectives

Too Broad	Too Specific	Appropriately Specific
Students will read about and understand the cultural contributions of various regions of the United States and how they help to form the national heritage.	After reading, students will be able to list three differences between games from the Colonial era and from today.	Students will read to learn the differences between games that children played during the Colonial era and games played today.
Students will read about and understand the concept of checks and balances.	After reading, students will be able to create a detailed comparison matrix of the tasks handled by each branch of the government.	Students will read to learn about the roles and responsibilities of the legislative and executive branches.
ELLs will learn vocabulary related to weather.	After five practice sessions, ELLs will be able to connect 10 pictures with the matching vocabulary terms with 80 percent accuracy.	ELLs will be able to predict meanings of weather-related vocabulary while reading and demonstrate their understanding by drawing a representative picture of each term.

In addition, it is good practice for teachers to form contracts with their students in order to develop appropriately specific learning objectives or goals (Dean et al., 2005). Opportunities to personalize teacher-created learning objectives can increase students' motivation to learn by giving them a greater sense of control over the process (Dean et al., 2012). To help students write personal learning goals that are attainable, provide sentence starters such as "I want to know. . ." or "I wonder. . ." which can help establish their individual interests

related to the topic. When content is new and challenging, students can skim through the textbook chapter or preview other relevant resources before they write their goals. The act of previewing serves as an advance organizer—a well-known and widely used technique for organizing and interpreting new information that is especially effective when students have limited or no prior knowledge of the material (Mayer, 2003).

Encourage students to write concrete and measurable goals. For example, if a student writes “I want to be a good artist,” then encourage revision to something along the lines of “I want to learn how to use perspective in my drawings.” Likewise, “I want to learn what the chapter says about the causes of the Civil War” is a better goal than “I want to read the whole chapter in one sitting.” When teachers set clear learning goals and students have opportunities to personalize them, students are more likely to be able to explain what they are learning and be more interested in learning in general (Dean et al., 2005).

Motivation makes a difference

We have established that reading comprehension improves when teachers foster the development of vocabulary, comprehension skills, and related writing activities, but what about motivation? Motivation alone does not help students acquire these abilities, but an unmotivated student isn't going to develop them at all. Many reading researchers have noted that student motivation is an important concept that continually surfaces in adolescent literacy, and some view it as one of the primary determiners of adolescent literacy (Collins, 1997; Kamil, 2003; Moore, Alvermann, & Hinchman, 2000; Schunk & Zimmerman, 1997). It thus appears that motivation is an essential aspect of reading comprehension—one that teachers must consider when planning for instruction.

Guthrie and Humenick (2004) examined a variety of frequently used classroom practices (e.g., reading aloud, posing questions, modeling curiosity) that are likely to foster student motivation for reading, and they identified experimental evidence to support the effectiveness of at least four strategies:

1. Using learning goals to guide and support reading instruction.
2. Providing a range of choices in reading activities.
3. Providing students with interesting texts for reading instruction.
4. Ensuring collaboration among students in the classroom.

Naturally, it is possible (and advisable) to combine or merge these strategies, such as offering choices among interesting texts. Guthrie and Humenick also found that when students set personalized learning goals, they are more intrinsically motivated. For example, when introducing a lesson on the ecology of wetlands, teachers might ask students to develop their own questions about the topic that are both personally interesting and related to something they are doing in class (e.g., an upcoming field trip or a book they are

reading). Once students have written their questions, they can be posted on a class chart. Therefore, as individual questions are answered, all students learn.

The motivating power of choice

Another way to increase student motivation toward literacy is to provide a variety of reading material options and allow students to self-select the texts they read. Providing a range of reading choices is easy to do if you already incorporate independent reading time in your classroom or maintain a classroom library. Greenleaf and colleagues (2001) found that students were more motivated to read when they were allowed to choose among a variety of genres that offered multiple perspectives—particularly if those options included electronic and visual media.

Allowing for self-selection, whenever possible, provides opportunities for students to make valuable connections between texts and their daily lives. Therefore, it is important for students to be provided with research topics or writing assignments they find interesting and personally relevant. When teachers make an effort to learn about their students' interests and tailor assignments with those interests in mind, they are more likely to engage their students in reading about those topics, thereby motivating them to learn. "Self-regulation is only developed when students are given choices and the instructional support and aids needed to succeed at their chosen tasks" (Biancarosa & Snow, 2006, p.16).

Disciplinary literacy scholar Elizabeth Birr Moje (2008) advocates a more profound change: shifting textbooks to the back burner and replacing them with tools that historians, English professors, mathematicians, and scientists actually use, including new media, fan fiction, and mathematical and scientific models. She contends that by using primary, authentic texts more and textbooks less, literacy moves to the forefront of learning. According to Moje, simply using the same reading strategies in different content areas is too limiting, yet she acknowledges that her suggested approach places new demands on teachers—from identifying user-friendly materials to scaffolding instruction in order to teach primary source texts appropriately. Moje calls for more professional development to prepare teachers to model how to look back to texts and draw from them to make arguments and draw conclusions.

If your students quickly lose interest in the textbook you've assigned, consider relying less on the text and more on alternative sources: magazines, newspaper articles, and trade books that deal with the same subject. When selecting additional books and reading materials for your classroom, keep struggling readers in mind. In addition to high-interest topics and issues, look for the following supports that will encourage students, especially those who are struggling readers, to keep reading:

- A compelling storyline and credible characters (plausible plot and teenage protagonists).

- Supportive formatting that includes illustrations and appropriate text placement on the page (hyphenation is a problem for struggling readers, line spacing is more important than type size, and some type faces are more easily readable than others).
- Careful introduction and reinforcement of difficult vocabulary and concepts (difficult words should be used more than once, and every difficult word should be presented in such a way as to make its meaning clear).
- Straightforward plot development (flashbacks, time shifts, and confusing changes in point of view are not used).
- Simple sentence structure (the subject and predicate must be physically close to each other, subordinate clauses should follow the main clause or be clearly set off by commas, semicolons are avoided). (Rog & Kropp, 2001, n.p.)

Positive mental dispositions

When most people recall their experiences reading *Romeo and Juliet* in high school, for example, they remember not only the plot of the play but also how much they enjoyed or hated the experience itself. This is because the human brain stores memories in many different ways, but everything we learn has an emotional connection (McBrien & Brandt, 1997; Vacca, 2006). A student's mental disposition, then, refers to his or her affective response toward reading—toward the emotions and values involved—rather than just toward the facts and ideas presented. It includes the student's motivation to do what is required, confidence in his or her ability to succeed, and interest in actively pursuing meaning while reading. It also includes how much new learning the reader wants to integrate into his or her current schema and, of course, how he or she feels about the content (Frager, 1993; Giancarlo, Blohm, & Urdan, 2004).

In addition, students need to see value in what they are asked to do. Although content-area teachers are fascinated by their own subjects, their students may not immediately share that excitement. Enthusiasm can be contagious, but explanations about what students will gain by learning content material can also help motivate students. Explaining the role of statistical models in determining the winner of the Cy Young award or using the law of physics to explain why a head-first slide is faster than going for the bag feet first will peak many students' interests.

The power of "I can" beliefs

Our mental habits influence everything we do. For example, if a student has a negative attitude toward reading because of a self-perception that he or she is a poor reader who can't understand unfamiliar text, chances are that this attitude will become a self-fulfilling prophecy. "Whether or not a reader feels confident that he or she has the skills

to handle a given reading situation makes a difference in that reader's approach" (Vacca, 2006, p. 56). If a student has a defeatist attitude, that student will approach difficult text reluctantly, give up easily when encountering obstacles, and ultimately not understand the content covered in the reading assignment. An "I can" belief, or a belief that you can accomplish what you want to accomplish, is an important factor in successfully executing certain tasks or reaching certain goals.

Psychologist Carol Dweck and her colleagues at Stanford University conducted research in which they identified two mind-sets, or ways of viewing intelligence and learning—fixed and growth—and the effect each has on school behaviors. Students who subscribe to a growth mind-set, however, believe they can develop their intelligence over time, and they see challenging work as an opportunity to learn. By contrast, students who view intelligence as fixed (an inborn trait) place an inordinate value on "looking smart" and are reluctant to exert effort beyond their comfort zone. They avoid activities that could possibly lead to failure, and they are more easily discouraged when they encounter the same obstacles that students with a growth mind-set find engaging. "Within a classroom culture that supports a growth mind-set, teachers can design meaningful learning tasks and present them in a way that fosters students' resilience and long-term achievement" (Dweck, 2010, p. 18). To reach all students, teachers should present challenges as fun and exciting, give students a clear sense of progress toward mastery, and grade on actual growth (e.g., use a grade of "not yet").

"I can" beliefs are particularly important in science and mathematics, where students who struggle or experience failure tend to adopt a permanent attitude of "I'm just not good at that, and I never will be." A belief that you either have a gift for learning science and mathematics or you don't can be quite harmful. Stephen Pellathy, a science curriculum specialist and physicist says, "The reality of science is you're basically always failing. . . . So if you don't have that mindset that your failures are setting you up for your subsequent success, you won't keep going" (Roth, 2011).

Of course, anyone can experience problems reading and understanding text in any discipline if they haven't developed effective mental habits. Indeed, you can probably recall a time when you easily breezed through a novel yet had difficulty trying to understand the instruction manual that came with a new computer. Technical material typically includes specialized vocabulary and requires some background knowledge. Motivated by the need to get your computer up and running, you most likely persevered through the material, acting out what you thought it was instructing you to do. In essence, you applied the mental habits of maintaining an open mind, pushing the limits of your knowledge and abilities, applying familiar strategies, and sticking to it. Over time, you probably got better at reading and comprehending technical instructions, and as your ability increased, so too did your confidence.

These mental habits are referred to as “intelligent behaviors” or “habits of mind” (Costa, 1991; Marzano et al., 1997; Paul, 1990; Perkins, 1993), and they help learners both in school and throughout their lives. Productive mental dispositions look like this:

- Be open-minded and flexible about ideas and solutions.
- Be aware of your own thinking, behaviors, and feelings.
- Be accurate and seek accuracy.
- Be clear and seek clarity.
- Monitor and control your behavior, learning, and work.
- Plan appropriately.
- Respond appropriately to feedback.
- Identify and use necessary resources.
- Restrain impulsivity.

How can teachers help students acquire positive habits of mind? First, they must explain that certain behaviors can enhance learning and what those behaviors look like in the classroom. This might sound obvious, but lower-achieving students often fail to realize that their attitude, mental habits, and frame of mind affect their learning. They also do not understand that they have the power to regulate these feelings, attitudes, and behaviors. Similarly, ELLs, who may become easily discouraged because they are at various levels of English acquisition, will benefit when their teachers make visible the thinking tools that experienced readers and writers use to construct meaning (Olson & Land, 2007).

Second, teachers must provide clear examples for students. They need to model productive habits of mind, discuss real-world examples that appear in the news or other popular media, and reinforce their use in class. Self-efficacy, text comprehension, and motivation work together to create a collective “I can” belief among students (Vacca, 2006). Students who practice these behaviors regularly become self-directed learners who are aware of their mental disposition, monitor it, and modify it as needed. Likewise, effective readers know that comprehension is not something that just happens; they take an active role in the reading process to ensure comprehension.

One teacher’s steps to success

Educator and author Cindi Rigsbee (2011) describes what she has learned about motivating students while working to increase their engagement and learning in her English classroom. Here are three steps she offers from personal experience:

1. *Establish an environment that celebrates success.* Be careful not to “overpraise.” Be sure to notice small victories for every student, but guard against effusive praise that may become meaningless.

2. *Establish an environment that supports struggling students, enriches the high flyers, and pushes those in the middle by offering activities that are appropriate for every student in the class.* In addition, try not to demand a “performance” in front of peers unless students have had adequate time to prepare and know what is expected of them. Providing students with choice in assignments and projects also is an optimal way to differentiate for all students while increasing buy-in and engagement.
3. *Establish an environment that says “we’re a community of learners in here.”* Make sure each student feels safe and can learn in an atmosphere that is nonthreatening. Activities that allow for social interaction ensure that students feel more comfortable sharing what they do (or don’t) know and understand. Have clear expectations for how students treat one another, and model the respect you want them to display.

This type of classroom culture “can only be attained when the teacher makes an effort to really *know* the students—their strengths, weaknesses, likes, dislikes, fears, and dreams” (Rigsbee, 2011, p. 2). A few ways teachers can get to know their students better are informal conversations, scheduled conferences, or by reading their opinions on assigned journal topics (e.g., free writing on a daily topic from current events at the beginning of class).

Sharing the Responsibility for Learning with Students

There is considerable research evidence to support the teaching of strategies that are geared toward developing students’ sense of personal responsibility. Results of a meta-analysis on classroom management showed a decrease in disruptive behavior when students were taught two kinds of strategies: (1) self-monitoring and control strategies, and (2) cognitively based strategies. Both strategies involve teaching students to observe and monitor their behavior, but the first one also emphasizes keeping a record of behavior, establishing a criterion level of behavior, and receiving rewards when the student achieves the criterion (Marzano, 2003).

Regardless of the evidence, teaching responsibility strategies is not a common practice among K–12 educators. Why is this so? Many teachers consider this “above and beyond” their role as educators, and, indeed, responsibility instruction can be a demanding task that often involves dealing with complex, longstanding problems. Nonetheless, teachers should be encouraged to recognize the value of such instruction and “rise to the occasion,” when needed. For instance, sharing the Reading Troubleshooting Chart (Figure 3.3) with students is one way to help them understand they have the ability to help themselves and have the power to respond to whatever reading challenges they encounter.

Aside from the sheer value of hard work, it is also important for students to learn how to analyze problems and figure out solutions—not just accumulate facts. Teachers can

FIGURE 3.3 → Reading Troubleshooting Chart

The Challenge	The Reading Lifeline
<i>You almost “get” it but not quite.</i>	Reread.
<i>You “get” the overall idea, but the details escape you.</i>	Discuss what you are reading with someone else, clarifying points that support the “big picture.”
<i>You don’t understand much of what you are reading or viewing.</i>	<ul style="list-style-type: none"> • Ask someone who understands the content to explain it to you and then reread. • Look up the topic online to build background knowledge.
<i>You can recite facts from the text, but you really don’t understand what the author is trying to communicate.</i>	<ul style="list-style-type: none"> • Go back and/or read ahead, looking at nonprint features of the text (graphs, charts, illustrations, chapter titles, words in bold). • Try to identify important parts of the text and skim through those passages again. • Read through the table of contents, the introduction, or the text on the back of the book. • Think of questions you would like to ask the author and continue reading to see if your questions have been answered.
<i>You are having trouble understanding because you don’t know enough about the subject to “put it all together.”</i>	Build your background knowledge by finding information from another text on the same topic, such as an online resource, a book, a magazine, or a video, or by talking to someone who is knowledgeable about the subject.
<i>You feel as if you are reading a foreign language.</i>	Determine key vocabulary you don’t know and find the meaning by using context clues, asking someone for meanings, or using a dictionary or glossary.
<i>You find yourself distracted or bored when you read and are unable to concentrate.</i>	<ul style="list-style-type: none"> • Read more quickly or slow down, forcing yourself to pay attention by stopping at intervals to think (or talk about) what you have read. • Take mental or physical breaks from the text. • Try to visualize what is happening, placing yourself within the text rather than reading as an observer. • Set a purpose for reading, even a small one to keep you focused.

FIGURE 3.3 → Reading Troubleshooting Chart (*continued*)

The Challenge	The Reading Lifeline
<i>You understand what you are reading up to a certain point and then you seem to lose it.</i>	<ul style="list-style-type: none"> • Summarize what you have read so far, either by talking to someone, reviewing it out loud, or writing about it. • Try to predict what might come next. Read to find out if your predictions are correct. • Try to pinpoint when the confusion started and go back and reread a few paragraphs before that point.
<i>You have difficulty because you disagree with the author or have strong feelings about the text.</i>	<ul style="list-style-type: none"> • Write to explore your feelings about the text and gain understanding of the author's viewpoint. • Return to the text and mentally engage the author in a conversation or debate about the issues. Think about what you would say to the author to change his or her mind. • Remember that you have the right to your opinion about a text. Allow yourself time to stop and think through what is bothering you.
<i>You've reread but you still don't get it.</i>	<ul style="list-style-type: none"> • Read the text orally or ask someone to read it to you. • Try to pinpoint what is confusing and ask your teacher or someone else to help you clarify.
<i>You are having trouble knowing what is important in the text.</i>	<ul style="list-style-type: none"> • Set a purpose for reading. Tell yourself that you will read a part of the text for a specific reason (such as to find out why something happened) and concentrate only on that purpose. • Use a double-column note-taking approach, "What's Important" on one side and "Why?" or "What's Interesting?" on the other. • If you are reading a textbook, look at chapter headings, words in bold, and captions for illustrations or charts.

Source: From *Literacy for Real: Reading, Thinking, and Learning in the Content Areas* (pp. 68–69), by R. C. Lent, 2009, New York: Teachers College Press. Copyright 2009 by Teachers College Press. Reprinted with permission.

provide direct and explicit instruction on the appropriate strategies, but it is up to students to focus their attention on the reading or learning tasks at hand. Here are some things teachers can do to help students make personal connections with the reading materials and read with a clearly defined purpose:

- Express confidence in every student's ability to access prior knowledge.
- Fill in any gaps in students' background knowledge before assigning reading.
- Demonstrate how to "chunk" assigned work into manageable pieces.
- Acknowledge small successes in addition to large ones.
- Encourage risk taking when students answer questions about what they have read.
- Validate responses and give credit for specific aspects of a response that are correct.

Give students the metacomprehension edge

Thus far, we have focused on ways to help students plan for reading, such as activating their prior knowledge, previewing the selection for reader aids, identifying unfamiliar vocabulary, setting purpose, and practicing productive habits of mind. However, monitoring the effectiveness of one's reading behaviors on comprehension means something more. It involves the abilities to observe and assess those behaviors and to select alternative behaviors and strategies, as needed, to improve comprehension.

Think about a particular activity in which you engaged recently—teaching a specific class, playing a game of tennis or golf, working out, preparing a meal, or even playing a video game. Create a mental visual of what you did, what you thought, and how you behaved as you engaged in this activity. Assuming that you wanted to successfully accomplish the task, you may remember how you thought about and evaluated your actions as you were doing them. Just as you are doing now, you stepped outside yourself to observe or monitor the effectiveness of your actions and attitudes at different points during the activity. As necessary, you adjusted your behavior so you would be more likely to achieve your goal. Ultimately, you were strategic and reflective as you performed the activity. Various researchers use the term *metacomprehension* to refer to this strategic and reflective approach to reading comprehension (e.g., Caverly et al., 1995; Gavelek & Raphael, 1985; Osman & Hannafin, 1992).

Some reading researchers distinguish among the terms *metacognition*, *metacomprehension*, *self-explanation*, and *self-regulation*, but the concepts expressed by each overlap significantly. "Metacognition as it relates to reading involves the reader being aware of the reading process and knowing what to do when the reader's level of comprehension is not sufficient, or does not satisfy the reader's goals and desires" (McNamara & Magliano, 2009, p. 61). Metacomprehension, on the other hand, refers to the ability to monitor one's own understanding of information, to recognize failures to comprehend, and to employ appropriate repair strategies. Self-explanation is the process of explaining text to oneself, either orally or in writing, and self-regulation refers to one's ability to make adjustments to the learning process in response to feedback.

Strategic and reflective learners are aware of their learning style and able to select and regulate their use of learning skills and strategies. For example, students are being strategic

(and using metacognition) when they keep track of the steps in a multistep problem and know which ones they've completed and which to do next; when they realize they have lost track of events in a text and turn back a few pages to reread; or when they recognize that using context clues to determine the meaning of an unfamiliar word isn't working, so they persevere and become motivated to find a strategy that will work.

Few teachers would argue with the importance of metacognition and metacomprehension skills, but acquiring these skills does require instruction and practice. An easy, effective tool for teachers in any discipline is the following metacognition checklist, which is composed of five simple questions students should ask themselves. As they answer each question, students begin to understand that they have the ability not only to understand how they learn best but also to improve in some areas. For example, if a student answers "no, I can't recall the details" to the first question, then you (and your student) have a place to begin improving. To help build memory skills, your student may need to look for key words from a list you provided, and read with a pencil and sticky notes nearby. With each key word encountered, the student can write out and place a sticky note on the page. In this way, students can recognize their unique learning needs and practice ways to effectively learn new knowledge.

After introducing students to the concept of metacognition, assign a reading/writing task. Afterwards, instead of grading it, ask students to answer some, or all, of the following questions:

- Can I recall the details from the reading assignment?
- Does my answer to the question make sense?
- Did I understand any new words?
- Did I read and follow directions?
- Did I give the number of required examples?

The importance of questions before, during, and after reading

Noted educator John Dewey is credited with saying that we learn by doing if we reflect on what we have done. Certainly, ideal readers reflect on content while they read, weighing it in light of what they already know, think, and believe. Guided, active reading requires teachers to pose questions at strategic points—questions that demand a certain amount of introspection and reflection from students while they are reading. Research on the role of questioning as it relates to reading and learning reveals the following (Graesser, Ozuru, & Sullins, 2010):

- Most students don't ask very many questions while in learning settings.
- Most student- and teacher-posed questions tend to be shallow, including those written by textbook writers.

- When teachers invest time in teaching students how to ask deeper questions, they are facilitating comprehension and learning.
- There are several psychological models that specify how to stimulate more and deeper questioning (e.g., teachers modeling deep questions; teachers presenting challenges that place students in cognitive disequilibrium, such as presenting obstacles to goals, contradictions, conflict, and anomalies).

Since questioning helps readers think about what they read, it is helpful to have a framework for developing and asking questions. You may want to share the table in Figure 3.4 with students and let them select and adapt questions they think will be the most helpful as they read.

A Final Thought on the Goals and Dispositions Gear

We know that students are more likely to learn when they feel capable of succeeding and when they recognize a purpose of the learning activities. Teachers can boost students' competence by helping them see relevance in what they are learning, pressing them to achieve at high levels, and providing adequate support. The results of a study by the Southern Region Education Board (SREB), an organization that has spent more than 20 years examining the high school experiences of students nationwide, provide insight into the power of high expectations that are coupled with the right supports (SREB, 2004).

Researchers at SREB studied 13 Georgia high schools where both test scores and student graduation rates were rising. Looking for the common factor among the schools, the researchers concluded, "These most-improved schools were not just about rigor; they were about students seeing a purpose in what they were being asked to learn" (Goodwin, 2010, p. 23). It is almost assured that the students in these Georgia schools are experiencing success because teachers deliver challenging instruction and set the bar high.

FIGURE 3.4 → Questions for Reading Strategically

Prereading Questions
<ul style="list-style-type: none"> • What do I think the reading selection will be about? What predictions can I make? • What are some things I already know about the topic? • What are my reading goals? What concepts do I want to learn from reading this selection? • What is my purpose for reading? What will I need to do with the information I learn? (Take a quiz or a multiple-choice test? Complete a performance activity? Write an evaluative essay?) How will this affect the way I read the selection? • What strategies can I use as I read to understand the selection? What will I do if I encounter difficulty? • How will I know I understood the author's intended message?
During-Reading Questions
<ul style="list-style-type: none"> • What do I think the main ideas are so far? Why? • What kind of graphic organizer can I use to begin organizing these ideas? • What can I picture in my mind about these ideas? • Is the information in this selection similar to anything I have learned before? How? • What questions do I have at this point in my reading? (Write them down.) • What is my attitude toward reading the selection at this point? Do I need to modify any of my behaviors, attitudes, or resources to reach my goal?
After-Reading Questions
<ul style="list-style-type: none"> • Were my predictions about the main ideas accurate? • What other information do I want to remember? How will I remember it? • Did I accomplish my reading goal? • Which reading and learning strategies did I find most helpful? Why? • Which parts of the selection interested me most? Which ideas made me think? • How has my thinking changed as a result of reading this selection? What have I learned about myself? • What should I do differently next time I read a similar selection?

04

Creating Literacy-Rich Environments

“Outstanding reading education programs are grounded by content, powered by teaching, energized by apprenticeships, enriched by diversity, evaluated by assessment, and sustained by vision and good governance.”

—Susan Pimentel, *Teaching Reading Well*

Characteristics of Literacy-Rich Content-Area Classrooms

What does today’s classroom look like when teachers intentionally plan lessons that support adolescent literacy development? Research provides an answer: “School and classroom cultures that successfully promote the development of adolescent literacy skills are characterized by connections, interaction, and responsiveness, which lead to student engagement and reflection” (Meltzer, 2001). Though socioeconomic status, class size, and teacher credentials certainly are important, research indicates that collective efficacy—a shared belief among teachers that they can help students succeed—has the greatest impact on student achievement (Goodwin, 2010). The following examples present glimpses of literacy-rich classroom environments in three content areas where motivation, literacy strategies, and reading across the curriculum effectively come together (Meltzer, 2001).

In literacy-rich mathematics classrooms, language processes support students while they are learning new content and help them demonstrate what they have learned.

- The teacher models problem-solving techniques such as think alouds, and students talk and write about how they solve problems.
- Students actively develop concepts with their teacher.
- The teacher helps students make connections to real-life applications.

- Students actively construct mathematics-specific vocabulary and explicitly use reader aids to enhance their understanding of mathematics texts.
- Students work in varied, flexible groupings to present mathematical solutions to problematic scenarios.

In literacy-rich science classrooms, reading, writing, and discussion are a daily occurrence.

- Students use a variety of texts, including academic journal articles, scientific websites, science fiction, and essays.
- Students have access to electronic media, film, visuals, and lab experiences, which further support reading comprehension.
- Students actively construct science-specific vocabulary and explicitly use reader aids to enhance their understanding of science texts.
- Students frequently discuss, present, and write about possible hypotheses, predictions, analyses, findings, and ideas.
- Students include elements of the writing process in their lab reports, solutions to problem sets, and research findings.

In literacy-rich social studies classrooms, students' interests are taken into account, and students work in various groupings on different kinds of assignments.

- Students use various resources, including reproductions of primary sources such as diary entries, maps, film, historical fiction, and newspaper accounts.
- Students explicitly call out reader aids, use specialized vocabulary in spoken and written communications, and investigate the thinking and approaches of anthropologists, archaeologists, economists, sociologists, and social historians.
- Students actively explore essential questions and make frequent connections between and among eras, people, and events from the past and present.
- Students use research skills and examine how languages develop and how various cultures use them.

We don't mean to imply that content-area teachers should become reading and writing teachers. Rather, they should emphasize the reading and writing practices that are specific to their disciplines. All teachers should use the tools (e.g., graphic organizers, outlines, guided discussions) that research shows support all students—those who are experiencing success and those who are struggling. In addition, the idea of a reading apprenticeship has been proposed as a model for direct, explicit comprehension instruction (Biancarosa & Snow, 2006). In it, students act as apprentices to their teachers, who are the content-area

experts, and learn how to read and write in a particular discipline. Reading apprenticeship classrooms focus less on strategy implementation and more on creating an environment in which students become active and effective readers and learners. To accomplish this, teachers need to plan along four dimensions—social, personal, cognitive, and knowledge building—and encourage metacognitive conversations in their classrooms (Jordan, Jensen, & Greenleaf, 2001).

- The social dimension focuses on establishing and maintaining a safe and supportive environment in which all members' processes, resources, and difficulties are shared and collaboration is valued. One simple and effective way to do this is to use the “turn to your neighbor” technique.
- The personal dimension focuses on improving students' identities, their attitudes as readers, and their interest in reading. It also promotes self-awareness, self-assessment, metacognition, and ownership. Teachers should gradually release the responsibility for learning to students.
- The cognitive dimension is where students are given the reading tools and strategies they need to read like experts in the discipline. Students need to practice these skills and receive feedback. Ultimately, students must learn to transfer their skills to new learning situations.
- The knowledge-building dimension focuses on building content, topic knowledge, and knowledge of a discipline's typical text structures and styles.

Establishing Safe and Productive Learning Environments

Picture the following scenario: you are on a plane home after attending a conference on teaching innovations for the 21st century, and you have a binder full of conference material you want to read. In addition, you have a meeting scheduled with your superintendent an hour after your plane lands in order to share key ideas from the conference and a summary of the materials. It was raining when the plane took off, and the captain announces that the turbulence you feel will be getting worse. Everyone should remain seated for the duration of the flight, and seatbelts should remain tightly fastened. The young mother sitting next to you is trying desperately to soothe her 10-month-old baby, who is squalling and pulling at his ear. The woman apologizes for the noise, explaining that the baby has an ear infection. How well do you think you would be able to focus on your reading?

Truly, the environment in which reading occurs influences comprehension. When you ask young people about a good place to read, they respond with everything from “in bed” to “at the park,” “in the car,” or “by the pool.” Although teachers have little control over the environment in which students read outside of school, they are able to create an

environment in their classrooms that enhances learning. For example, research suggests students learn best in a pleasant, friendly climate where they

- Feel accepted by their teachers and peers.
- Feel a sense of safety and order because academic expectations, instructions, and purpose for assignments are clear.
- Feel confident in their ability to complete tasks successfully.
- See value in the learning activities. (Marzano et al., 1997; McCombs & Barton, 1998)

Ensuring acceptance, safety, and order

“In the classrooms of [the most successful teachers], also referred to as warm demanders, students actively participated in class discussions and were willing to work hard for their teachers, with whom they had developed a positive and mutually respectful rapport” (Goodwin, 2010, p. 10). Teachers can create a climate of acceptance in several ways. Even a simple, sincere gesture can help students feel connected to their teachers and to the school. Students report feeling accepted when their teachers listen to them and respect their opinions. Calling students by their preferred names, making eye contact, planning varied activities that address different learning styles and that capitalize on individual differences, encouraging even unassertive students to participate in class discussion—all of these help students feel as if they matter and their opinions count.

Many teachers find that standing at the classroom door at the beginning and end of each class is beneficial. As students enter or leave the room, teachers have a moment to gauge their attitudes, greet them with a warm smile, or praise contributions made that day in class. In addition, teachers communicate acceptance when they ask students about their performance in extracurricular activities such as sports, drama, or scouting.

Naturally, individuals need to feel safe from physical harm in order to be receptive to learning. Across the nation, teachers, administrators, and parents are working together to introduce and enforce schoolwide procedures aimed at violence prevention. Students also need to feel a sense of emotional safety—that is, that they are safe from emotional abuse. Within their individual classrooms, teachers can create a healthy climate by making it clear that any and all forms of put-down or abusive behavior will not be tolerated.

It should come as no surprise to hear that students are more receptive to learning if they feel accepted by their classmates and teachers. Successful language instruction is composed of social aspects that augment explicit teaching of syntax, grammar, vocabulary, pronunciation, and norms of social usage (Goldenberg, 2008). Collaborative learning activities require teamwork and therefore can be an excellent means for all students, whether native English speakers or ELLs, to learn about one another’s strengths, aptitudes,

and personalities. It follows that having ample opportunities to use language in meaningful and motivating situations is essential for all students.

Sometimes, students feel open to ridicule by their classmates when they are called upon to answer questions about classwork they don't understand. There are strategies that can help alleviate this problem, though. For example, a middle school mathematics teacher in Colorado reserves a large table in the classroom for students who need extra help during class. At the beginning of the school year, she explains to her classes that this table is "sacred"; it is a place where anyone can join her and receive help without worrying about what other students might say. Students quickly learn to regard this space with respect, knowing that there will be times when they need to use it. The teacher reports that, at times, there may be several students with her at the table; whereas at other times, there may only be one or two. However, all of her students treat those classmates who elect to be there with respect.

A sense of order is enhanced when teachers clearly articulate classroom rules and the purpose of each reading assignment. Students should be told ahead of time what they will be doing with the information they read (e.g., writing a summary, collaborating with others on an extended performance activity, participating in a discussion of the material). As we mentioned earlier, ineffective readers do not differentiate among reading assignments. They read all textbooks in the same fashion. Therefore, it is important for students to learn that a reader's purpose determines which strategies to employ, the pace at which to read, the type of mental questions to ask and answer while reading, and how to monitor comprehension.

Understanding the importance of a classroom library

"I believe a classroom library is the heartbeat of a teacher's environment. It is the window into an educator's own personality, and it reflects the importance of literacy in the classroom. I believe every teacher—no matter what subject he or she teaches—should have one" (Wolpert-Gawron, 2009, para. 1). Indeed, classroom libraries are as relevant today as they have ever been. In fact, they may be more important than ever before. Teachers would be well advised to weave libraries and the resources to which they provide access into their lessons, find creative ways to hold students accountable for reading (e.g., create book covers to decorate the classroom, design ads to persuade classmates to read a particular book, write and display reviews), and think of classroom libraries as interactive areas that students will use extensively. The following practical tips are invaluable (Ibid.):

- Require students to check out books by tracking titles on slips of paper that are filed in the library. When students return the books they borrow to the library, they file them on the correct shelves and then, with permission, tear up the appropriate checkout slips.

- Label every book in the library with genre-specific stickers to help categorize and organize the collection. As a class activity, students can decide which stickers to place on new books that are added to the library.
- Identify some high-interest books as noncirculating and for classroom reading only. Allow other to be checked out for seven-day periods.
- Perform classroom-library scavenger hunts with questions such as the following:
 - Which book has a map on the inside front cover?
 - Which author has written books in each of the genres in our library?
 - Which book series is a television show of the same name?
 - What is the title of the biography about the founder of Microsoft?

There are many types of readers in any given classroom—from reluctant readers to those who excitedly seek out favorite authors or genres—and it is the responsibility of all teachers to provide a safe and comfortable place where students can find appropriate reading materials. In addition, classroom libraries introduce students to the concept of short, teacher-monitored, and silent reading periods. Twenty minutes of silent reading is best followed by a five-minute open-ended discussion (Block & Parris, 2008).

Maximizing classroom discussions

Reading is a social act, which makes it ideally suited for adolescents who naturally want to be connected to others their age with similar interests. Discussion helps students clarify their understanding of what they read, refine their thinking, share their ideas, and explore related issues. In this way, reading (and writing) can become the driving force behind activism. Two forms of discussion—guided and reflective—can help students interact with the content, one another, and the topics about which they are passionate.

In guided discussion, the teacher uses questioning techniques and study guide materials to direct student thinking. Ultimately, the teacher's role is to encourage student questions about the content and provide additional information and clarification when needed (Vacca & Vacca, 1993).

When using guided discussion, teachers should take care not to let the discussion become a lecture. If the teacher is both asking and answering questions, then students quickly realize that it is unnecessary for them to speak up and share their thoughts. Another common pitfall in guided discussion is the tendency of teachers to allow a few bright, verbal students to monopolize class discussion. When this happens, other students feel self-conscious about participating, so they withdraw and don't feel comfortable sharing their ideas. Teachers should instead pose questions that require students to interpret the text, explore what the text means to them, and share these interpretations with one another. This independent construction of meaning requires students to interact with

one another (Brophy, 1992). Discussion allows students the chance to think through and paraphrase the content of any discipline and then “make it their own” by exploring the relationships between that content and their prior knowledge. Teachers can ensure more active participation if they clearly explain the purpose of the discussion, give explicit directions, and model the discussion skills of active listening, paraphrasing, and clarifying.

Mortimer and Scott (2003) explored classroom talk as it relates to the particular academic discipline of science by asking two research questions: Does it matter whether students are talking when they are directly engaged in science learning? Does it matter if a teacher’s style is limited to the presentation style? Their findings support the importance of classroom dialogue in secondary science classrooms: “It is through talk that the scientific view is introduced to the classroom. Talk enables the teacher to support students in making sense of the view. Talk enables the students to engage consciously in the dialogic process of meaning making, providing the tools for them to think through the scientific view for themselves” (Ibid., p. 3). They go on to identify four steps for teachers to follow when using their district’s science curriculum to plan discourse in their classrooms:

1. Identify the unique language that scientists use in the particular area of science you plan to teach.
2. Consider how students’ everyday social language reflects the concepts of this specific area of science.
3. Identify the learning demand by appraising the nature of any differences between steps one and two.
4. Develop a teaching sequence to address each aspect of this learning demand, identifying: (a) the teaching purposes for each phase of the sequence; (b) how those purposes might be addressed through an appropriate communicative approach; and (c) how this approach might be put into action through appropriate teaching activities, patterns of discourse, and teacher interventions.

By contrast, the purpose of reflective discussion is to help students extend and refine their knowledge by making judgments, defending their opinions, and thinking critically and creatively. Teachers guide students into being more independent learners by modeling productive ways of responding, reacting to diverse viewpoints and sensitive issues, and demonstrating how to think critically about difficult concepts (Alvermann, Dillon, & O’Brien, 1988; Phan, 2009). When students have a good grasp of the concepts they are studying, teachers should encourage reflective discussion and shift their role from leader/authority to participant. Here are a few general guidelines for creating a classroom environment that supports reflective discussion:

1. Arrange desks so students can see one another or easily break into smaller discussion groups.

2. Teach, model, and encourage active listening.
3. Clearly articulate the topic under discussion and the goal of the discussion.
4. Ensure that students stick to the topic of the discussion and don't go off on tangents.
5. Draw out students who are naturally quiet, shy, or reluctant to participate.
6. Avoid behavior that might stifle discussion (e.g., facial expressions or posture that betrays a personal judgment about students' opinions).

Prior to introducing a reflective discussion, the teacher should develop a main question to ask students and probable follow-up questions that students are apt to ask one another. A question to ask in a social studies classroom, for example, might be something such as this: Because the United States has a powerful and influential international status, should it be the world's "policeman"? Students should then spend time answering the question together, challenging one another's comments, and asking for clarification. As facilitator, it is important that the teacher refrain from dominating the discussion. Instead, the teacher should encourage students to explore as many aspects of the topic as time allows and to point out contradictions in one another's logic. In this way, the teacher shares the control and direction of the lesson with students, which further fosters students' interactions. For the conclusion, the teacher reasks the main question and lets students respond by stating either "Yes, the United States should police other nations because. . ." or "No, the United States should not police other nations because. . ." Finally, students might write a summary of the information they obtained from the discussion, what was learned, and why the discussion was useful. (Teaching Techniques, n.d.)

The two approaches are equally beneficial; guided discussion is particularly useful in encouraging students to be active participants in their learning, and reflective discussion is especially appropriate when a topic calls for making a decision, such as whether purchasing stocks in a particular company is a good investment or whether global warming is an imminent threat.

Creating a Culturally Responsive Classroom

Ladson-Billings (2010) calls attention to the ways that some teachers in urban schools are positively affecting the literacy performance of African American children. Three major themes that emerge are immersion in text-rich environments, exposure to meaningful texts through both reading and writing, and meaningful links between literacy and real-life experiences. She asserts that teachers who link literacy activities to students' cultures and wider social contexts ensure that those students acquire the skills and understandings necessary to read and write well.

Culturally responsive teachers focus on academic achievement while maintaining and celebrating their students' cultural identities and heritages. When teaching literature, they

select stories that reflect multiple ethnic perspectives and literary genres. When teaching mathematics, they incorporate the economics, employment statistics, and consumer habits of various ethnic groups. Culturally responsive teaching, then, incorporates students' cultural knowledge, prior experiences, and performance styles to make learning more appropriate and effective by teaching to and through students' strengths (Gay, 2000). Specifically, culturally responsive teaching can be identified by the following characteristics:

- It acknowledges the legitimacy of various cultural heritages, both as legacies that affect students' dispositions, attitudes, and approaches to learning and as content worthy to be taught in the formal curriculum.
- It builds meaningful connections between home and school experiences and between academic abstractions and sociocultural realities.
- It uses a wide variety of instructional strategies that are connected to different learning styles.
- It teaches students to recognize, understand, and respect the variety of cultural heritages represented in their classroom.
- It incorporates multicultural information, resources, and material in all of the content areas.

Culturally responsive teaching has also been described as comprehensive, multidimensional, empowering, and transformative (Ladson-Billings, 2010). It is comprehensive when students see themselves as part of a collective effort to achieve academic and cultural excellence. When teachers are intentional about exhibiting the successful interpersonal relationships they expect from their students, students learn to be accountable to the larger group while also feeling supported and encouraged by it. It is multidimensional when teachers from various disciplines (e.g., language arts, science, social studies, music) collaborate and teach a single cultural concept. It is empowering when students believe they can succeed in learning tasks and have the motivation to persevere and when teachers demonstrate ambitious and appropriate expectations while supporting their efforts. Ultimately, it is transformative because it helps "students to develop the knowledge, skills, and values needed to become social critics who can make reflective decisions and implement their decisions in effective personal, social, political, and economic action" (Banks, 2001, p. 131).

Using Writing as the Ultimate Reading Strategy

Author and educator Mike Schmoker describes a research study conducted by the Leadership and Learning Center that reveals approximately 25 percent of students scored proficient or higher on state assessments in schools where writing and note taking were rare in science classes. By contrast, in schools where science teachers required writing and

note taking, 79 percent of students scored at the proficient level. In his words, “writing matters—hugely” (Schmoker, 2011, p. 192).

After giving a writing assignment, many teachers have heard questions such as these: Are you grading this? How long does it have to be? Does spelling count? Students ask these kinds of questions when they don’t connect writing to learning; rather, they think of writing as a separate assignment—one disconnected from usual learning activities. Students sometimes view writing in this light because teachers traditionally use it only as a product—an essay test, theme, or lab report to be completed at the end of a lesson or unit. However, the very act of writing requires deep thought and active engagement with the content. As students write, they construct meaning around the content, make connections, and discover what they do and do not know. Writing is a tool for learning; it is fundamental to acquiring, thinking about, and communicating knowledge in all disciplines (Bazerman, 2009; Fulwiler, 1987). Because of its value as formative assessment, writing should never be used solely as summative assessment. Rather, writing is a powerful vehicle for teachers to provide students with feedback and encouragement to further explore a topic and revisit their ideas.

When teachers do use writing as a culminating activity, it is usually to sum up a lesson or unit and to determine whether students have learned what was intended. Examples of lesson plans that include after-reading writing activities abound on the Internet, and first-person summary narratives are particularly popular. In a summary narrative, students retell events or a process from an imagined personal perspective. For example, following a social studies unit about the Texas Revolution, students write dramatic narratives based on historical facts pertinent to the Battle of the Alamo. Likewise, a science teacher might assign a narrative entitled “A Day in My Life as a Volcano,” or a health or physical education teacher might assign a narrative about the effects of exercise written from the perspective of a heart or pair of lungs. The summary narrative is a versatile and motivational tool because it requires students to process and make sense of expository text. Nevertheless, to emphasize the ways in which writing helps students learn, and to help students think of writing as a useful learning activity, teachers need to regularly assign writing-to-learn activities.

Writing-to-learn activities are informal writing tasks that help students think through key concepts or ideas that were presented in class. They differ from essays, reports, and themes in that they are exploratory. Although grammar and mechanics are still important, the purpose of writing-to-learn activities is to reflect on what’s been learned, develop some parameters around it, and make meaningful, personal connections between it and students’ life experiences.

Writing-to-learn activities work equally well as both in-class and homework assignments. Here are some basic tips for developing writing-to-learn topics in content-area classrooms:

- Keep assignments short (e.g., Give students “think time,” but ask them to write for only five minutes).
- Expect creative thinking and exploration of the content, and share expectations with students (e.g., Ask students to write about what the topic means to them).
- Identify the intended audience (other than you, the teacher) ahead of time.
- Display student writing—representative of all levels of quality—in the classroom. (Students will write more carefully if they think someone other than the teacher will be reading it.)
- Vary the types and formats of writing required (e.g., learning log entry, analogy, poem, editorial, letter to the textbook publisher or a friend, respond to reading).
- Encourage students to interact with their reading assignments by summarizing key points, clarifying confusing material, asking questions about material, recording observations over time, and defining key terms.

Some teachers are hesitant to incorporate writing-to-learn activities because they are wary of the additional work and paper load they might create. Assessing student writing means evaluating it in light of the depth of thought displayed, and there are many creative ways to keep it simple:

- Don't grade every single assignment.
- Use a rubric that has been previously shared with students.
- Use feedback forms with familiar sentence starters, such as:
 - I like what you said about . . .
 - When I read what you wrote, it reminded me of . . .
 - Have you thought about . . . ?
 - I'd like to read more about your personal experience with . . .
- Teach students to read and comment on one another's writing constructively.

Characterizing Literacy-Rich Schools and Districts

Biancarosa and Snow (2006) identify 15 key elements of effective adolescent literacy programs, which they divide into two categories—instructional improvements and infrastructure improvements. The three school-level structures we discuss next—(1) teacher teams, (2) teacher leadership, and (3) a comprehensive and coordinated literacy program—are identified as essential infrastructure improvements, along with extended time for literacy, professional development, and ongoing summative assessment of students and programs.

Teacher teams

Interdisciplinary teacher teams are supportive school structures because they ensure coordinated instruction and planning for all grade levels and content areas. When such teams are in place, teachers meet regularly to discuss the learning needs of students they have in common and to align instruction across content areas. The teams provide opportunities for language arts teachers to better support content-area teachers, and they create more consistent instruction by reinforcing reading and writing skills, such as note taking and comprehension strategies, in all content areas.

This is especially important in middle and high school because students in these grades have several teachers during discrete blocks of time devoted to different subjects. Too often in today's schools, one teacher has no idea what another is teaching; this is particularly true in high schools. Teacher teams can prevent a loss of consistency in literacy instruction or reestablish coordinated instruction once it is lost. In addition, teacher teams promote collegiality, which enhances communication and information sharing about areas in which students might need additional support and heightens the likelihood that no child will slip through the cracks.

Teacher leadership

Teacher leadership is a supportive structure because teacher leadership teams are responsible for clarifying the decision-making process and communicating decisions and actions to the rest of the staff. Teachers play a critical role in ensuring the success of curricular reform, and their involvement is all the more crucial if a principal or other administrator has not assumed the instructional leadership role. Of course, for any curricular or instructional reform to succeed, it needs a principal's clear commitment and enthusiasm. When teacher leadership teams are in place within a school, principals are less removed from classroom instructional concerns. By regularly participating in scheduled meetings of their teacher leadership teams, principals hear input that team members have solicited from the rest of the staff. Therefore they are more likely to know how students' needs differ and to understand how some struggle with reading and writing. In addition, a principal who is a true instructional leader attends professional development sessions along with teachers in order to obtain the same knowledge and skills and to understand how best to organize and coordinate changes in the school's literacy program. Such training provides principals with the proper foundation to make decisions that alter structural elements, such as class schedules and teacher planning periods, and to ensure opportunities for collaborative data analysis, collaborative examination of student work, action research, or similar programs that support literacy efforts and student learning.

A comprehensive and coordinated literacy program

A well-designed literacy program goes beyond teacher teams and includes other school personnel—such as librarians, reading specialists, literacy coaches, and resource room teachers—in truly comprehensive teams. An effective literacy program recognizes that creating fluent and proficient readers and writers is a very complex task and requires consistent and coordinated implementation of several unique elements—from direct, explicit comprehension instruction to intensive writing to ongoing summative assessment of students and programs in all classrooms. Because the literacy needs of adolescents are so diverse, the intensity and nature of instruction in a comprehensive and coordinated literacy program—as well as one in which teachers are involved—varies substantially.

Biancarosa and Snow (2006) call for funders, researchers, policymakers, administrators, teachers, parents, and students to join forces as common stakeholders in the improvement of adolescent literacy. In addition, they call on secondary schools to recognize adolescents' varying needs and develop schoolwide comprehensive programs that will successfully address those needs. Whereas some students need their content-area teachers to make only modest accommodations or adjustments, other students need learning strategies, explicit strategy instruction, or even instruction in basic literacy skills embedded within content-area material. Alternatively, entire schools may need to follow in the footsteps of San Diego's Hoover High School and implement a content-area Sustained Silent Reading (SSR) program.

One of the lowest-performing high schools in the state in 1999, Hoover embraced SSR as part of a larger schoolwide improvement effort that included professional development with literacy strategies; a focus on standards; block scheduling; administrative accountability; and a variety of writing classes, including a required class for freshman. Hoover's approach to SSR meant all students and most staff members stopped to read at designated times, a strategy that required buy-in from the entire staff and a ready supply of books (Strickland & Alvermann, 2004). After five years, reading achievement increased by an average of 2.4 years, and the school demonstrated the city's most significant gain on the state accountability test (Lent, 2009).

Many factors influence a school's decisions about literacy instruction. One thing teachers can do to better understand their school's approach to literacy development is to meet with other teachers to analyze and discuss the school's literacy environment. This might mean collecting and sharing writing rubrics and writing samples and then examining them in light of what the school defines as "good writing." It could also simply be asking, reflecting on, and actively discussing questions such as the following:

- What is working about our literacy program?
- Do others agree with us?

- What can we improve?
- What do we need to learn more about?

A comprehensive and coordinated literacy program must include initiating and augmenting collaborations with external organizations and the local community to provide broad-based interactions and greater support for all students. These collaborations further secure student motivation by providing them with a sense of consistency between what they experience in and out of school (Biancarosa & Snow, 2006).

Going Beyond Professional Development

Brozo and Fisher (2010) write that research allows us to know, with certainty, that teachers must participate in comprehensive staff development to significantly improve adolescents' literacy skills (e.g., Sturtevant et al., 2006). Nevertheless, many middle and high school teachers have not been adequately trained in the current theories of content literacy, and they are unable to make disciplinary knowledge accessible to all of their students because they lack the skills to do so. The following five principles should guide district-level leaders' decisions about professional development aimed at nurturing adolescents' content-area reading skills.

1. **Offer teachers a manageable number of new strategies.** Having a relatively small set of strategies allows teachers to build their expertise. When a district focuses its professional development efforts on ensuring teachers can effectively implement a few strong strategies, teachers and students alike are more likely to experience success, which, in turn, motivates them to want to do and learn more. Who isn't encouraged by "quick wins"?
2. **Move from workshop to classroom.** Team teaching and in-class modeling build teacher comfort and confidence. In addition to quick wins, districts should keep an eye on more distant goals, which requires an investment in sustained, job-embedded, and ongoing professional development.
3. **Establish forums for teacher empowerment.** Teacher focus groups or committees also are forums for brainstorming new ideas and approaches. Districts should encourage school-level teacher forums as a source for innovation and a way to better address the needs of students within a particular district's surrounding community.
4. **Vary the formats used in staff development.** Flexibility in formats, whether one-on-one or mini-coaching clinics, provides teachers with options and opportunities to share. For example, districts might explore purposeful learning communities, online learning groups, or regional consortia as ways to provide choice and more flexible professional development opportunities.

5. **Start with those teachers who are most eager, and then spread the learning.**

Enthusiasm is contagious, and those teachers who are early adopters of literacy reform efforts deserve recognition. Districts would be wise to recognize, support, and tap the excitement of those educators who build on successes.

Although providing high-quality professional development is a significant responsibility for districts, district leaders also play a considerable role in raising literacy expectations across grades and curricula by taking steps to help all educators understand real-world demands and the importance of promoting literacy rooted in academic disciplines.

For example, in Tennessee's Hamilton County Public Schools, the district superintendent led an effort to raise curricular requirements. The Public Education Fund (PEF) in Chattanooga and the Chattanooga Area Chamber of Commerce strongly supported the initiative. To make the case for more rigorous standards, district leaders, the PEF, and the Chattanooga Area Chamber of Commerce conducted surveys of local employment requirements. The surveys revealed a shrinking pool of local jobs that required only a high school diploma and substantiated the need to increase student achievement (National Governors Association Center for Best Practices, 2005).

Districts can also develop their own literacy plans, which can be extensions of school-wide improvement plans that include an explicit focus on literacy. Alternatively, schools and districts can use the same literacy plan template, and school and district leaders can attend the same training on how to develop a literacy plan. It is imperative that there is agreement on how to provide all students with reading comprehension instruction and embed literacy instruction in content-area classes. District-level plans should also

- Address ways to support students in meeting state standards.
- Be based on real-time school data.
- Draw on research-based teachers' practices and methods for teaching adolescents.
- Differentiate between instructional approaches (e.g., curricula, pedagogy, materials) and structural approaches (e.g., time, facilities, teachers' assignments).
- Detail ways to reach and support students who struggle with reading and writing.
- Identify training and other technical assistance resources that can help teachers, principals, and district administrators analyze performance data and use data to inform planning, practice, and professional development (National Governors Association Center for Best Practices, 2005).

A Final Thought On Creating Literacy-Rich Environments

Today, adolescent literacy is considered a hot topic in education, and there is a growing body of research to guide decisions at the classroom, school, and district levels. Even so,

it is hard to shake the feeling that something has long been awry and that change is long overdue. Some even call it a case of neglect (Heller, n.d.). Perhaps it has just been too easy to assume that children are learning to read in the early grades, but we now know that reading achievement is not finite—children don't attain proficiency and "hold" at an "acceptable" reading level for a lifetime; there is no ceiling for reading proficiency. Instead, children use language in various ways, as needed, throughout their lives and throughout their K–12 schooling. In truth, we should be aiming to create more than literacy-rich learning environments; we should be creating a literacy-rich world.

