Vicki Urquhart | Dana Frazee

TEACHING READING IN THE
CONTENT AREAS

If not me, then who?

Introduction

"New focus on reading, writing: Improving literacy offers gains in all subjects."

—Taryn Plumb, *The Boston Globe*

As a middle school or high school teacher, or even as a parent of a "tween" or teen, it's likely that you are not shocked by any part of the above news headline; however, you certainly may be dismayed. How and when did we stop expecting students to go to school and read and write in all of their classes?

Rediscovering the impact that reading in the content areas has on learning is the primary goal of this book. The second goal is to provide the latest research, tools, and guidance necessary to ensure that reading is a part of every young person's daily learning experience.

Rationale: An Abundance of Compelling Reasons

The following short anecdote comes from the previous version of this book, which was written in 1998. We return to it now because, in many ways, students' attitudes about reading haven't changed much in the intervening years. This exchange is just as likely—and relevant—today as it was then. Perhaps you can sense the alarm one of the authors felt after hearing this response from her daughter's boyfriend, Brian, when she asked him about reading: "No, I don't read much; actually, I haven't read a book all summer. . . ." Knowing that he was valedictorian of the senior class, she asked him about the reading involved with his assignments in school. "Oh, I read what I need to in order to get by, but nothing more. I know I should read," he admitted, "but I just don't get into it."

The authors of the second edition of this book had plenty of data showing Brian to be a typical student. A long-term assessment of academic progress, the *NAEP 1998 Reading Report Card for the Nation and the States*, had found that nearly half of the 9-, 13-, and 17-year-old students they surveyed reported reading ten or fewer pages each day, including material read in school and for homework (Donahue, Voekl, Campbell, & Mazzeo, 1998). The same report revealed 36 percent of 9-year-olds, 48 percent of 13-year-olds, and 39 percent of 17-year-olds watched three to five hours of television per day.

More data analysis revealed that a shocking percentage of our adult population—from 15 to 30 percent—had difficulty reading common print material such as news articles, report cards, coupons, recipes, or even the directions on prescription medicine bottles (Barton, 1997; Stedman & Kaestle, 1991). There was also the stark pronouncement that some adults, much like Brian, simply chose not to read. According to Bernice Cullinan (1987) of New York University, approximately 80 percent of the books read in the United States were read by about 10 percent of the people. This was a startling revelation about the reading habits of one of the most advanced countries in the world. Could it be that the American intellect was in free fall? These kinds of statistics suggested to some that it was. Finally, two Kent State University education professors came to the disturbing conclusion that many preservice teachers disliked reading and avoided it whenever possible (Manna & Misheff, 1987).

Fast forward to 2012, and although there are still many students who opt out of reading, there are many others who choose to opt in. Key findings from consumer research provide a hopeful glimpse into young readers' attitudes and behaviors (Scholastic, 2008):

- A majority of kids say they like to read books for fun, and reading books for fun is important.
- Most kids perceive a correlation between reading and success.
- One in four kids aged 5–17 reads books for fun every day (high-frequency reader), and more than half of all kids read books for fun at least two to three times a week.

These findings are reportedly based on more than 1,000 interviews, including 501 children aged 5–17 and their parents or guardians, in 25 cities across the country. In another report, however, we can see the other side of the proverbial coin—a return to the belief that most young people are choosing not to read.

The authors of *To Read or Not To Read* (National Endowment for the Arts [NEA], 2007) describe their data collection and analysis process as encompassing data from large, national studies regularly conducted by federal agencies and supplemented by academic, foundation, and business surveys. NEA chairman Dana Gioia considers the findings especially important because they go beyond literary implications to social, economic, and cultural ones. "Although there has been measurable progress in recent years in reading

ability at the elementary school level, all progress appears to halt as children enter their teenage years. There is a general decline in reading among teenage and adult Americans. Most alarming, both reading ability and the habit of regular reading have greatly declined among college graduates" (NEA, 2007, p. 5).

Although the question of whether today's students are reading seems to depend on whom you ask, Gioia suggests that there are a few "truths" that emerge from the data:

- Reading is declining as an activity among teenagers.

- College attendance no longer guarantees active reading habits.

- Even when reading does occur, it competes with other media.

- American families are spending less money on books than at almost any other time during the past two decades.

- Among high school seniors, the average reading proficiency score has declined for virtually all levels of reading.

- Reading proficiency rates are stagnant or declining among all adults.

The young people you know and teach probably fall somewhere between the extremes; they might not openly profess to a love of reading, but they do sometimes love a particular book or series of books—as witnessed by the way many adolescents (and adults) have devoured the *Twilight* and *Harry Potter* books. Although some young people may not be reading the so-called classics, they are finding and reading funny, contemporary stories about people their own age.

However, no one can deny that data shine a spotlight on real and legitimate concerns. We know, for instance, that reading for pleasure correlates strongly with academic achievement; that employers rank reading and writing as top deficiencies in new hires; and that good readers generally have more financially rewarding jobs, whereas less-advanced readers report fewer opportunities for career growth (NEA, 2007). It is, in the eyes of some, a crisis of epic proportions. Nevertheless, as within every crisis, cooler heads and calmer voices do exist. Vicki Jacobs sees "opportunities ahead for researchers, policymakers, and practitioners who are positioned to respond to the adolescent literacy crisis and improve adolescent literacy achievement" (2008, p. 7). There are opportunities enough to go around, but perhaps none is as great as the opportunity (and challenge) the classroom offers.

New Challenges

"There are approximately 8.7 million 4th through 12th graders in America whose chances for academic success are dismal because they are unable to read and comprehend the material in their textbooks" (Kamil, 2003, p. 1). To help all students become better readers,

educators must understand the premise that guides the teaching of reading in their discipline, how to choose the best reading strategies from the vast array available, and how to put it all together and positively impact student learning. The greatest challenge, though, may be in understanding the learning process from a wider perspective, especially as it relates to variables such as technology, changing student demographics, and a national set of common standards for academic achievement.

Technology promotes skimming, scanning, and flipping

Technology's explosive growth over the past few decades has fueled much speculation about the future of the book as we know it and, of course, of reading. In the early 1990s, Microsoft, Hewlett-Packard, and IBM conducted web usability studies, some of which included an examination of how people read while online. Their conclusion was . . . they don't. Instead, when they look at text on a screen, people tend to skim, scan, and flip—they don't read deeply or for an extended period of time. Some Internet users even warn others that content is long and takes too much time to read, simply by communicating "tl;dr," which stands for "too long; don't read" (Fernando, 2011).

Even the perception of reading is changing. This is becoming more and more evident as we find that when we mention an interesting book to colleagues, many respond along the lines of "I'm really a Kindle kind of person," suggesting that "Kindling" and reading are distinctly different activities. Although e-readers now sit among the stacks of hardbacks, paperbacks, and magazines in many homes, some people no longer think of themselves as "book readers." This situation sounds fairly ominous, but even Jeff Bezos, founder of Amazon and a passionate Kindle promoter, remains a fan of the printed book, calling it an "incredible device" that is "highly evolved" (Levy, 2007). In truth, the only thing certain about the future of reading is that it is changing—new rituals (sitting down at your computer, searching the e-library, and downloading your e-book) replace existing ones (sitting in your favorite chair, adjusting the light, and turning to a dog-eared page), but reading remains an active and demanding process that requires effort on our parts.

The question is whether our students see it this way. If they don't, what can we do about it? They are, after all, "digital natives," which is how Marc Prensky (2001) refers to the generation of students who have been exposed to technology since birth. For them, it is completely natural to skim, scan, and flip through reading materials.

Therefore, it should come as no surprise that parents still worry about the effects of all this technology use. The *2010 Kids and Family Reading Report* (Scholastic, 2010), based on a nationally representative sample of 1,045 children aged 6–17 and their parents, reports that parents believe the use of electronic or digital devices negatively affects the time children spend reading books, doing physical activity, and engaging with family. In addition, when asked about the one device parents would like their children to stop using

for a one- or two-week period, parents most often cite television, video game systems, and cell phones.

Not surprisingly, the kids surveyed see things a little differently. It appears that they even define the term *reading* differently than their parents do; for example, they expand it to include reading text messages. Nonetheless, 66 percent of children aged 9–17 report in the Scholastic study that they won't abandon printed books, even though e-books are available. Faced with the ubiquity of technology, what's a teacher or parent to do?

One suggestion is simply to reembrace the maxim "if you can't beat 'em, join 'em." After all, there is some research to support such an approach. For example, in an effort to identify adolescents' motivation to read, 11 researchers (who also happen to be college and university teachers) interviewed teens from various school settings at eight sites (Pitcher et al., 2007). Aware of adolescents' use of technology, they adapted their questions and prompts in an effort to better understand how preteens and teens see themselves as readers. Here is a typical exchange with a 6th grader:

> Interviewer: How much time do you spend on the computer a day?
> Adolescent: Two hours every day.
> Interviewer: What do you usually do?
> Adolescent: Search and play games on the Internet. I go to Ask Jeeves and ask questions. Draw things and write e-mails, print them out and hang them up. Shop for my mother so she can go to the store and buy things. Read about things that are going on around the world. I read magazines and music on the Internet and about getting into college and things. (Pitcher et al., 2007, p. 378)

The researchers in this study concluded that these adolescents were reading and writing for many hours each day in "multiple, flexible, and varied ways and formats" (Ibid., p. 394), yet they didn't see themselves as readers or writers because they were using computer literacies, which they considered to be different from more traditional, school-based reading and writing skills. The primary recommendation for teachers, then, is to get to know your students, including their personal uses of literacy and what's important to them. Furthermore, the research team suggests that teachers model their own enjoyment of reading; find ways to incorporate multiple literacies into their classrooms; embrace engaging and interactive activities (e.g., book clubs, literature circles); include reading material that represents a variety of formats, levels, and topics; and incorporate elements of choice in reading and project assignments (Ibid.). The key point of this study is something most teachers agree with: by increasing students' motivations to read, you increase the odds of improving reading outcomes.

Consider also the striking headline that recently ran in *The Denver Post*: "It's old school—and it's the future" (Nix, 2011). The article profiles Thomas MacLaren School

in Colorado Springs, where single-sex classes, Latin classes, and reading the classics are the norm. All of the school's 110 students follow the same liberal arts curriculum, which includes learning how to play a stringed instrument. This is not an elite school, curriculum, or group of students. One-third of the students benefit from free or reduced lunch, and one-third belong to an ethnic minority group. School leaders say they simply aim to attract and keep students for whom the curriculum and approach are a good fit. Although a focus on liberal arts might sound "old school" to some, it is hard to believe that today's generation will be ready to lead globally until it has mastered the skills we most often need and use—not the ability to multitask with numerous electronic devices but the ability to read widely, think deeply, and question courageously.

An ELL population booms

You have probably heard statistics about how English language learners (ELLs) form the fastest growing segment of the U.S. school-aged population, yet many of these students continue to lag behind their peers on state and national achievement measures. "The students' levels of exposure to English, their educational histories, the socioeconomic levels of their families, and the number of books in their homes all play a role in their readiness to learn—and learn *in*—a new language" (Hill & Flynn, 2006, p. 3). Further complicating the situation, rigorous research into the instructional practices that target ELL literacy and language development remains scarce (Barker, 2010).

The National Clearinghouse for English Language Acquisition (n.d.) reports that in 2008–2009, approximately five million ELLs were enrolled in grades pre-K through 12. We can imagine the frustration teachers in general education classrooms must feel as they try to meet the needs of this growing population in their classes, knowing they should differentiate their instruction for ELLs yet not knowing how. With the right assistance and models, though, teachers can learn to integrate reading, writing, and content into their ELL instruction. Margarita Calderón, senior research scientist and professor at Johns Hopkins University, acknowledges that limited English language skills is a major contributor to low student performance. However, after conducting three five-year studies on expediting reading comprehension in ELLs, she confidently asserts that teachers can learn to craft their instruction in a way that accelerates ELLs' achievement and addresses their lack of background knowledge and vocabulary. "Teaching subject matter to ELLs requires direct, explicit instruction in the strategies students need to build vocabulary and comprehend grade-level texts" (Calderón, 2007, p. viii).

The really good news here is that the type of instruction Calderón proposes works for *all* students. Whenever instruction is intentional, research-based, and integrated, students benefit. Better still, teachers can learn which reading strategies are best suited to each discipline, how and why they work, and specific ways to adapt those strategies

for their students, content, and classroom. Not surprisingly, "quality teaching is critically important to ELL language development (and maintenance), regardless of program model" (Barker, 2010, p. 3).

The Common Core makes its entrance

In the summer of 2009, armed with and alarmed by data about a nationwide decrease in graduation rates, and resulting from an outcry among many in the business community that they were spending huge sums of money to remediate new hires in basic reading and writing competencies, three organizations came together united by one goal: build upon the most advanced current thinking on how to prepare all students for success in college and their careers. The Council of Chief State School Officers, a nonpartisan organization of the heads of departments of elementary and secondary education, together with the National Governors Association, the bipartisan organization of the nation's governors, joined to form the Common Core State Standards Initiative. By June 2010, this group had published two documents: *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects* and *Common Core State Standards for Mathematics.*

A closer look at the English language arts and literacy standards reveals four strands that comprise the College and Career Readiness anchor standards: (1) reading, (2) writing, (3) speaking and listening, and (4) language. Within each strand, standards are organized under a set of topics that apply across all grades (Kendall, 2011). The example in Figure A is based on the anchor standards for reading.

The new common core standards require students to read considerably less fiction. Two objectives emphasized are: (1) engage students in increasingly complex texts as they move through school, and (2) help students conquer literacy skills specific to disciplines such as history and science (Gewertz, 2011). In general, research evidence supports this change, since there is a significant difficulty gap between texts used at the end of high school and those used at the beginning of college. One reason for the gap in students' ability to readily comprehend higher-level texts is that as college and workplace texts have become more complex, K–12 reading texts have become easier. Consequently, students leave high school without having developed the skills to comprehend challenging text, particularly when it comes to discipline-specific texts. In addition, K–12 reading usually favors narrative fiction over expository texts, yet the majority of reading required in college and the workplace is expository prose. According to David Coleman, one of the lead writers of the common core standards for English/Language Arts, by preparing students to succeed in college and build solid careers, text complexity and disciplinary/literacy skills become inseparable (Gewertz, 2011).

FIGURE A → Excerpt from the Common Core English Language Arts Anchor Standards for Reading

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Key Ideas and Details

- Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Craft and Structure

- Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

Integration of Knowledge and Ideas

- Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

Range of Reading and Level of Text Complexity

- Read and comprehend complex literary and informational texts independently and proficiently.

Source: From *Common Core State Standards: English Language Arts* Standards, 2010, Washington, DC: National Governors Association Center for Best Practices, Council of Chief State School Officers. Retrieved from http://www.corestandards.org

For students who may need reading remediation in college, the outlook is grim; they are the least likely to complete a degree (Kendall, 2011). Therefore, many experts agree that the goal of connecting K–12 standards with postsecondary education is the right one, as long as the standards are consistently revisited and updated according to students' education needs.

The Current Literacy Landscape

Although researchers began to scrutinize literacy practices in the 1970s, and they continued to do so throughout the 1980s and 1990s, it was the 2000s that some called, perhaps ironically, the "literacy decade." Although reading skills are only improving minimally, greater worldwide interest in the topic clearly has emerged. The United Nations, for example, proclaimed 2003–2012 the Literacy Decade and has stated its intent "to increase literacy levels and to empower all people everywhere" (United Nations Educational, Scientific, and Cultural Organization, n.d.).

The Programme for International Student Assessment (PISA) and the Progress in International Reading Literacy Study are the two leaders in global comparative studies in reading comprehension. Since 2000, PISA has administered standardized tests in reading, mathematics, and science to more than one million 15-year-old students in 41 countries, and it continues to collect and share test results. In reading, for example, questions focus

on the ability to read written text in real-life situations. These two organizations partnered to make the resulting test data available to countries around the world. In so doing, they ushered in an era of global literacy, during which a common foundation in reading comprehension instruction shone a spotlight on foundational instructional strategies (Block & Parris, 2008). However, according to national assessments, the reading skills of many U.S. students in general, and of high school students in particular, have shown little or no improvement, despite regular and substantial increases in federal and state funding over the past several decades for elementary and secondary education. According to a 2011 report on state test score trends from 2002–2009, high school scores on state English language arts and mathematics tests have risen modestly in most states since 2002, but progress made by high school students has been markedly less than progress made by students in 4th through 8th grades (Center on Education Policy [CEP], 2011). Furthermore, the authors of the study observe that "many states show a troubling lack of progress among high school students at the advanced achievement level" (CEP, 2011, p. 2).

Various skills-related issues contribute to the difficulties students have with reading and writing in the content areas. Many students have trouble understanding concepts in a science, history, or mathematics text because they haven't learned how to mentally organize information as they read or because they have little or no experience with the topic and don't know how to make meaningful and personal connections to new ideas while reading. When students lack the effective reading and self-regulation skills needed to persevere and succeed, they sometimes simply label an assignment as "too hard" or "boring." Additionally, research on school-level, teacher-level, and student-level influences on student achievement identifies vocabulary as a pivotal component of a student's background knowledge (Marzano, 2003). A lack of background knowledge is a hurdle for many students, and because vocabulary is a significant component of background knowledge, it is a particularly tough challenge for ELLs.

Timothy and Cynthia Shanahan, who prefer the term *disciplinary literacy*, have identified something of a catch-22 for teachers when it comes to teaching reading in the content areas: literacy professionals don't know enough about the content areas to help teachers in those subjects teach students with appropriate literacies, and teachers in the content areas don't know enough about the literacy demands of their specialized content areas to know what literacies to teach students (Shanahan & Shanahan, 2008). To successfully read texts in different content areas, students must develop discipline-specific skills and strategies along with knowledge of that discipline, including knowledge of the authors, the genres they use to reach their audiences, and their purposes for writing (Ibid.).

By focusing on the differences of how content-area experts read and reason, teachers can be better prepared to help students understand that the ways they read in Biochemistry are different from the ways they read in English, European history, or mathematics. In English, for example, students might read a short story in its entirety, then go back

and analyze its theme and structure for further discussion. In mathematics, though, they would benefit from learning to read as mathematicians do—reading and rereading the same few lines of text, which requires tolerance for the intensity of "close reading." (Gewertz, 2011)

There is no doubt that teachers continue to face tough odds in the ongoing effort to improve literacy nationwide. Given the complexities of the reading process, teachers deserve clear, research-based answers to their overarching questions about teaching reading in the content areas:

- What are the specific skills students need in order to read effectively in a particular content area?

- What strategies should I use to help my students become more effective readers and independent learners?

- What type of learning environment promotes effective reading and learning?

As with earlier editions of *Teaching Reading in the Content Areas*, this third edition aims to help you—the content-area teacher—by answering these questions. Before going any further, however, we want to assure you that an emphasis on reading and writing in your daily instruction works to strengthen students' ability to access and grasp the key concepts of your content area. Consider the story of Brockton High School in Brockton, Massachusetts, where 4,400 students from 50 countries—70 percent of whom are from low-income households and one-third of whom speak a language other than English—come to learn. And learn they do. In 2009, the Achievement Gap Initiative at Harvard University recognized the school as one of 15 exemplary schools in the United States. Thirteen years ago, though, Brockton High School had quite another story.

In 1998, when Massachusetts implemented standardized testing in reading and mathematics and tied it to graduation requirements, the administrators at Brockton High School received reports showing their students' abysmally low test scores and were told that more than 75 percent of their students would not graduate. In response, they joined forces with a small group of interested teachers at the school who wanted to spearhead a schoolwide literacy program to reinforce reading and writing in every class—including mathematics, science, and even band and physical education. This group, which eventually became a restructuring committee, asked one question: "What are the skills we want our students to have by the time they leave Brockton High School? Their answer: reading, writing, speaking, and reasoning (Ferguson, Hackman, Hanna, & Ballantine, 2010).

The restructuring group believed the path to success for their students would be through a schoolwide literacy initiative. Their first goal was to make the four core skills—reading writing, speaking, and reasoning—an integral part of the curriculum. They began by outlining the elements of each skill and displaying the elements on charts posted in

every classroom. They decided to focus on one of the elements every year, and the administration set up a calendar to reflect this expectation. The school provided professional development, and all teachers were asked to learn and use literacy strategies. One year, for example, the school tenaciously focused on active-reading strategies.

After one year, students' failure rate on the English language arts (ELA) portion of the state test dropped from 43 to 23 percent, and they continue to drop. "The transformation at Brockton has been remarkable: Failure rates for that state test have dropped to 6 percent for English" (Murthy & Weber, 2011). According to Jennifer Morgan, an instructional resource specialist and teacher coach at the school, after seeing such powerful results, teachers were willing to implement the next element of the literacy initiative. Results continue to impress. In 2008, students' ELA test score gains from 8th to 10th grade ranked the school above the 90th percentile when compared to other high schools in Massachusetts (Ferguson et al., 2010). In 2009, 77 percent of the 882 graduates planned to attend two- or four-year colleges (Bolton, 2010).

Five Research-Based Recommendations for Content-Area Teachers

In the report *Bringing Literacy Strategies into Content Instruction,* Kosanovich, Reed, and Miller (2010) make five scientifically based recommendations they consider pivotal to improving adolescent literacy. Their recommendations provide an instructional focus and suggest improvements that content-area teachers can make to improve reading comprehension among adolescents. They call for the recommendations to be implemented in a thoughtful, planned, and systematic manner: "When implemented widely and effectively, [the five recommendations] will likely lead to significant long-term improvement in adolescents' literacy abilities" (Kosanovich et al., 2010, p. 9). In addition, they realistically point out that teachers and administrators may need high-quality professional development to successfully implement the recommendations. As you continue through the rest of this book, you will likely recognize the recommendations reflected in the various literacy-related topics we discuss.

Recommendation 1:
All teachers should provide explicit instruction and supportive practice in effective comprehension strategies throughout the school day

Graphic organizers and questioning techniques are two comprehension strategies used across content areas that have been studied broadly. Newer findings suggest that some comprehension strategies are specific to a content area or even a specific course. Even though science, mathematics, and social studies all demand distinct reading and writing skills, common features of strategy instruction that are particularly important for adolescent readers include

- Discussions to help students become more aware of their own cognitive processes and to help them set a purpose for using comprehension strategies.
- Teacher modeling of explanations for when, how, and why to use particular comprehension strategies.
- Many meaningful opportunities for students to use comprehension strategies and receive teacher feedback.
- A gradual transfer of responsibility for implementing comprehension strategies from teacher to student.

Recommendation 2:
Increase the amount and quality of open, sustained discussion of reading content

Research supports the frequent use of both teacher-led and small group discussions. Rich discussions about text have the potential to increase students' abilities to analyze what they read, to think critically, to engage students, and to improve students' conceptual understanding and learning—all of which can lead to improved reading comprehension over time. Discussing texts is a way to mine the shared knowledge of the class while simultaneously supporting students as they independently construct meaning. The impact of these experiences extends beyond a single lesson; it ultimately supports comprehension when students read text independently.

Recommendation 3:
Set and maintain high standardsfor text, conversation, questions, and vocabulary

Teachers need to use instructional methods that support student growth toward meeting the literacy standards of the school, district, and state. Regardless of how high the literacy standards might be, they will nevertheless have minimal impact if teachers do not buy in and are not "on board." For all students to reach high literacy standards, schools and districts need to implement evidenced-based instructional techniques such as those covered in this book.

Recommendation 4:
Increase students' motivation and engagement with reading

Although research does not identify specific motivational techniques for particular types of students, it does support using the following techniques:

- Give students more choices of text and assignments to build their autonomy.
- Create opportunities for students to interact with each other in pairs or in small groups with a shared focus on understanding text.

- Provide students with a variety of interesting texts that reflect the diverse interests of adolescents.
- Focus students on personally important and interesting learning goals.

Recommendation 5:
Teach essential content knowledge so students can master critical concepts

As students improve their knowledge in a specific area, their ability to understand the associated reading material also improves. As a content-area teacher, you are much more likely to improve your students' ability to independently comprehend relevant reading material when you use instructional routines that support their understanding of content-area vocabulary, concepts, and facts.

Three Interlocking Gears of Disciplinary Literacy

At its most basic, teaching reading in the content areas is about helping learners make connections between what they already know and new information presented in written form—either in a textbook or electronically. As students make connections, they create meaning and better comprehend what they are reading. Teaching reading in the content areas, therefore, is not about teaching basic reading skills; rather, it is about teaching students how to use reading as a tool for thinking and learning.

An approach that some literacy experts recommend is for content-area teachers to plan lessons that, initially, do not require extensive reading (e.g., Lee & Spratley, 2010). Teachers should introduce a variety of on-level texts that will allow students to use what they already know to tackle discipline-related problems presented in the text. Over time, teachers can steadily increase the complexity of the texts, moving students from on-level texts to above-level texts. You might find the information in Figure B to be a helpful reference when preparing lessons or units of study.

A dynamic relationship

The previous edition of this book identified three elements that work together to determine the meaning readers construct from content-area text: the reader, and what he or she brings to the situation; the learning climate, or the environment in which the reading occurs; and the text features, or specific characteristics of the written text. A simple Venn diagram illustrates this approach (see Figure C).

It is true that the interaction of reader, climate, and text is in play whenever readers read, but more recent studies describe the need to move beyond content-area reading and toward content literacy that reflects the essential literacy skills of a particular academic discipline (e.g., Lee & Spratley, 2010; Shanahan & Shanahan, 2008; Vacca & Vacca, 2005). With this in mind, we revisit and redefine the three interactive elements as follows:

FIGURE B ⇢   **Needs of Adolescent Struggling Readers**

Instructional Foci for Supporting Adolescent Struggling Readers in the Content Areas

Apply both generic and discipline-focused strategies and knowledge to the comprehension and evaluation of

- textbooks
- full-length books
- book chapters
- journal and magazine articles
- newspaper articles
- historically situated primary documents
- multimedia and digital texts

Generic Reading Strategies	Discipline-Specific Reading Strategies
• Monitor Comprehension • Preread • Set Goals • Use Prior Knowledge • Ask Questions • Make Predictions • Test Predictions • Reread • Summarize	• Build Prior Knowledge • Build Specialized Vocabulary • Deconstruct Complex Sentences • Predict Main and Subordinate Ideas *(based on text structures and genres)* • Map Graphic Representations *(against explanations in the text)* • Pose Discipline-Relevant Questions • Compare Claims and Propositions Across Texts • Use Norms for Reasoning within the Discipline to Evaluate Claims *(i.e., What counts as evidence?)*

Source: From *Reading in the Disciplines: The Challenges of Adolescent Literacy* (p.16), by C. D. Lee and A. Spratley, 2010, New York: Carnegie Corporation. Copyright 2010 by the Carnegie Corporation of New York. Reprinted with permission.

FIGURE C ⇢   **Three Interactive Elements of Reading**
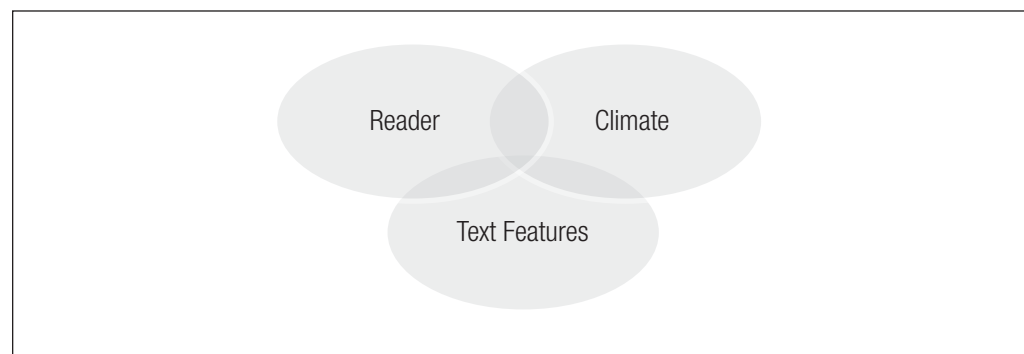
- The reader's **knowledge**, including experiences students bring to the classroom and the multiple ways in which they learn, in addition to how readers construct meaning while reading in specific disciplines.

- The reader's use of **strategies**, or ways of thinking and doing that reflect how experts in particular disciplines read and think.

- The reader's **goals and dispositions**, which include engagement, motivation, metacognitive skills, and teachers' expectations.

To fully understand how these elements affect the reading process, we examine them in light of findings and research results from the field of cognitive science.

About This Resource

This book should be a resource for expanding and refining your repertoire of teaching strategies as they apply to your subject. It also can serve as a guide for instructional planning and decision making as you meet with colleagues to consider your school's or district's curriculum objectives, the nature and needs of your students, and your personal teaching style.

In this book, we will

- Examine the dynamic relationship among three elements of the reading process that influence comprehension: knowledge, strategies, and goals and dispositions. These elements work together, much like the way that individual gears function as one assembly and for one purpose—to create forward movement.

- Explain how you can create a literacy-rich environment in your classroom and help expand that environment throughout the school and district. With a solid background in place, we look at the practical implications of integrating strategies on a daily basis and help you plan for instruction.

- Present teaching strategies that are proven to work best in certain content areas. Some strategies are most effective when they are adapted to a particular discipline by teachers who are experts in those fields. Teachers are able to maximize the effectiveness of the strategies they use by customizing those strategies with discipline-specific questions, vocabularies, purposes, and audiences (Shanahan, 2010). Thus, the strategies section of this edition has been fully revised to reflect this understanding.

FIGURE D ⟶   **Interlocking Gears of Disciplinary Literacy**
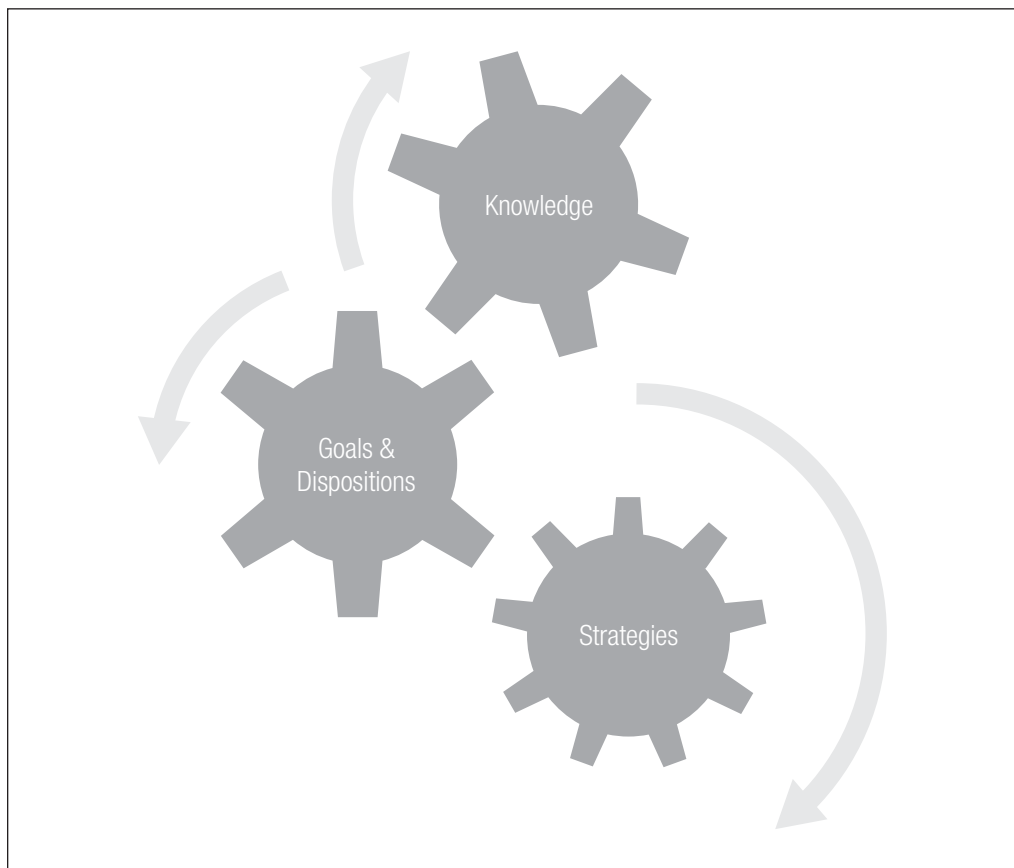
The Knowledge Gear

> "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 aulaclty uesdnatnrd what I was rdanieg. The pha-onmneal 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.

II

PART

Let's Get Started

Welcome to the strategies section of *Teaching Reading in the Content Areas*. Here in the 3rd edition, we have combined many tried and true strategies from previous editions with those from the mathematics, science, and social studies supplements. In addition, we've added some favorite strategies that emphasize rich discourse, writing, and collaboration—all of which are hallmarks of effective teaching and learning.

As is evident in this section, we think it is critically important for teachers to model every new strategy they introduce in the classroom. Regardless of your content area, we encourage you to use think alouds (Strategy 35). It's been our experience that many teachers and coaches view this particular strategy as the single most important one they use. Moreover, when we are in the field working with teachers and professional staff developers, we see over and over again that without explicit teacher modeling, students too often do not understand the essence of a particular reading or learning strategy.

We also want to remind you that new strategies are examples of procedural knowledge, which helps build automaticity and allows students to retrieve and use the facts, generalizations, and principles they have learned (Marzano & Brown, 2009). Research tells us that when building procedural knowledge, students must practice the relevant skills about 20–24 times before they really "get it." Therefore, don't give up if your students fail to understand or recognize the value of a strategy the first time it is used. Of course, many of these strategies enhance vocabulary development, and we encourage you to use the direct instruction five-step approach for the critical concept words and content you are teaching.

Direct Instruction Six-Step Approach for Vocabulary Development

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.

As You Begin

Neuroscience research has revealed that learning literally changes the brain by repeatedly organizing and reorganizing neurons, which actually changes the physical structure of the brain (Keil, Schmidt, Löwel, & Kaschube, 2010; Medina, 2008). We also know that different parts of the brain may be ready to learn at different times and that during the

learning process, nerve cells in the brain become more powerful and efficient (Wang, Conner, Rickert, & Tuszynski, 2011). These and similar findings suggest that the brain is a dynamic organ, shaped to a great extent by experience and by what a living being does (Bransford et al., 2004). Thus, we encourage you to use the strategies in this section with an understanding of what is happening in your students' brains.

The new knowledge we have gleaned from neuroscience, cognitive science, and developmental science applies to all learners, including teachers. Throughout this book, we ask you to intentionally integrate literacy into all of your instruction. We know that for this to happen successfully, you (and your brain) need to have your questions answered; be able to decide for yourself when, how, and why to integrate literacy with your content; be able to try new strategies and receive feedback; and be part of an actively supportive learning community. These four aspects of professional development—learner-centered, knowledge-centered, assessment-centered, and community-centered—will help produce the best teaching possible (Bransford et al., 2004).

We also have emphasized that teaching and learning vary from discipline to discipline. In other words, the evidence that supports a historical claim is different from evidence that proves a mathematical theorem or scientific theory. As an expert in your field, you are the person who best knows the structures of your discipline. Together with your pedagogical knowledge, you also know the best ways to use—and teach students to use—the strategies in this section. Recent research demonstrates that instruction is trending toward teaching fewer strategies and that students benefit from learning to combine those strategies (Block & Parris, 2008; Shanahan & Shanahan, 2008).

The following is a list of nine strategies that have been studied since 2000 and are deemed to be highly successful by the National Reading Panel. Students should be taught to

1. Predict by examining the features, or reader aids, present throughout the text.

2. Monitor through the use of metacomprehension.

3. Question when meaning is unclear.

4. Construct images and mental pictures while reading.

5. Use look-backs, rereads, and fix-it strategies.

6. Infer quickly, connecting ideas to known information and previous experiences.

7. Find main ideas, summarize, and draw conclusions.

8. Evaluate by noting aspects of story grammar and structure.

9. Synthesize all noticeable aspects of a text, from reader aids to conclusions. (Block & Parris, 2008)

For ease of use, we've arranged the strategies in this section alphabetically. At the beginning of each strategy is description box , like the one below, that indicates the strategy's many uses.

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____ Narrative Text
____ Informational
     Text
____ Prereading
____ During Reading
____ After Reading
____ Writing to Learn
____ Reflection
____ Discussion
____ Vocabulary
     Development
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Types of Text

- Narrative Text: stories, fiction books, poems, biographies, historical narratives
- Informational Text: nonfiction books, newspaper articles, Internet research articles, editorials, textbooks, advertisements

Potential Uses

- Prereading: The strategy may be used to activate prior knowledge before students begin reading and to provide an incentive to read.
- During Reading: The strategy may be used as students are reading to assist them in monitoring their comprehension.
- After Reading: The strategy may be used after students have completed the reading to assist them in summarizing their comprehension.
- Writing to Learn: The strategy may be used to introduce writing tasks (assigned after reading without explicit instruction in writing skills) and help students enhance their learning of content material.
- Reflection: The strategy may be used during and after reading to help students think about their learning, experience, and skills—and areas that need improvement.
- Discussion: The strategy may be used to help students reflect upon their newly acquired knowledge, process what they are learning by talking with and actively listening to their peers, and develop a common understanding about what they have read.
- Vocabulary Development: The strategy may be used to increase students' academic vocabulary before, during, and after reading to increase comprehension.

1. Academic Conversation

_X_ Narrative Text
_X_ Informational Text
___ Prereading
___ During Reading
___ Writing to Learn
_X_ After Reading
_X_ Reflection
_X_ Discussion
___ Vocabulary Development

What is it?

This strategy includes a set of conversational skills teachers can model and teach to help all students engage in extended meaningful conversation about narrative or informational texts (Zwiers & Crawford, 2009). Although these skills were designed specifically for ELLs who need scaffolding to use the skills effectively, they are pertinent to and necessary for all students. The skills include the following:
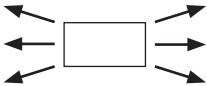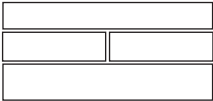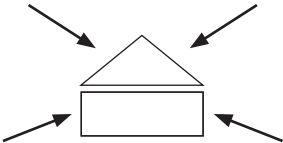
- Initiating a worthwhile topic
- Elaborating and clarifying
- Supporting one's ideas
- Building on or challenging another's ideas
- Applying ideas to life
- Paraphrasing/Summarizing

How do I use it?

1. Make a set of six visual reminder cue cards, so you can show students what they will make for themselves. Note cards work fine as cue cards. Then have students make a similar set.

   - On one side of each card, students should draw the symbol for one of the conversation features and label the feature.
   - On the other side of each card, have students write two headings: "Prompts for Using the Feature" and "Prompts for Responding."
   - Beneath each heading, write or have students write the prompts from the template.

2. Have students memorize one "Prompt for Using the Feature." For example, students can begin by memorizing "Why do you think the author wrote this?"

3. Teach the suggested hand motions for each feature. Model and use the hand motions consistently to reduce dependence on the cue cards.

4. Model how to use the cards and prompts repeatedly to increase fluency and familiarity with the strategy.

FIGURE S1.1 → Academic Conversation Features

Features of Conversations (with symbols and hand motions)	Prompts for Using the Feature	Prompts for Responding
1. Come up with a worthy topic (*put palm of hand up*)	• Why do you think the author wrote this? • What are some themes that emerged in. . . ?	• I think the author wrote it to teach us about. . . • One theme might be. . .
2. Elaborate and clarify (*pull hands apart*)	• Can you elaborate? • What do you mean by. . . ? • Can you tell me more about. . . ? • What makes you think that?	• I think it means that. . . • In other words. . .
3. Support ideas with examples (*put two palms up*)	• Can you give an example? • Can you show me where it says that? • Can you be more specific? • Are there any cases of that?	• For example. . . • In the text it said that. . . • One case showed that. . .
4. Build on the author's idea(s) or others' comments (*layer hands*)	• What do you think? • Can you add to this idea? • What might be other points of view?	• I would add that. . . • Then again, I think that. . . • I want to expand on your point about. . .
5. Apply/connect (*hook both hands together*)	• So how can we apply this idea to our lives? • What can we learn from this character/part/story? • If you were. . .	• In my life. . . • I think it can teach us. . . • If I were. . ., I would have. . .
6. Paraphrase and summarize (*cup both hands into a ball*)	• What have we discussed so far? • How should we summarize what we talked about?	• We can say that. . . • The main theme/point of the text seems to be. . .

FIGURE S1.2 ⇢ **Example of Modeling an Academic Conversation**

1. Read a text selection, stopping from time to time to elicit students' comments and questions.

2. As students offer their responses, ask them to elaborate, using the appropriate hand motion.

3. Ask students to pair-share and tell their partners whether they agree or disagree with their ideas.

4. Model by saying, "I agree with [Juan's] interpretation because. . ."

5. Lead a short whole-class discussion to brainstorm possible themes for the text selection.

6. Have students choose the themes they think are most relevant to the text selection and then identify examples from the text that support those themes.

7. Conduct a minilesson in which you carry on a conversation with the whole class, using the cue cards as necessary.

   a. Students: "Why do you think the author wrote this story?"

   b. Teacher: "Perhaps she wrote it because. . ." (*pause*) "Now what might you ask me?"

   c. Students: "Can you elaborate?"

   d. Teacher elaborates with more details from the text.

8. Remind students of the prompts on their cards.

9. Pair students for a conversation.

10. Have partners take out their cards and quiz each other on the symbols and prompts before beginning.

11. Tell students to use their notes and discuss possible themes of the text selection.

12. Go around the room and monitor the conversations.

13. Have each pair write an "exit ticket" synopsis of the conversation they had and then present that synopsis to the class.

14. Reflect on the process and have students self-assess with a kid-friendly rubric, such as the following:

FIGURE S1.2 → Continued

Conversation Skill	3: *I am practicing all of the skills.*	2: *I am getting better at some of the skills.*	1. *I need to practice the skills.*
Stay on topic	• I suggested a logical theme. • I stayed on topic the whole conversation. • I listened and built on the author's ideas and others' comments.	• I stayed on topic. • I tried building on others' comments.	• I came up with ideas that were not in the text. • I had a hard time staying on topic. • I have not tried building on others' comments yet.
Support ideas by explaining and showing examples from the text	• I prompted others to explain or give examples. • I gave explanations for my thinking and showed examples and details from the text.	• I gave explanations for my thinking. • I showed one example from the text.	• I had a difficult time explaining my thinking.
Make connections	• I could explain how this text connects to things in my life. • I could talk about what I learned from this text.	• I could explain how this text connects to things in my life.	• I could not explain how this text connects to things in my life.
Use appropriate conversation behaviors	• I actively listened to others. • I took turns speaking. • I paraphrased what others said.	• I took turns speaking. • I listened to others. • I don't know how to paraphrase yet.	• I think I talked too much. • I don't know how to paraphrase yet.

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About the Authors

Vicki Urquhart

As a communications manager for McREL, Vicki fulfills a variety of roles in writing, editing, and producing research-based publications and new products. An experienced presenter, she conducts workshops around the country. She has more than 20 years of experience as an educator, having taught at the secondary and postsecondary levels. Vicki coauthored *Teaching Writing in the Content Areas*, two booklets— *Remove Limits to Learning With Systematic Vocabulary Instruction* and *Using Writing in Mathematics to Deepen Student Learning*—and several articles for *Phi Delta Kappan, Principal Leadership,* and the *Journal of Staff Development,* among others. In 2007, she served on the planning committee that developed the 2011 NAEP Writing Framework.

Dana Frazee

As a principal consultant, Dana works in several areas of McREL's field services group: *Success in Sight* continuous school improvement, guaranteed and viable curriculum development, school audits, and teaching reading in the content areas. Dana has presented at numerous regional and national workshops on a variety of subjects, including teaching reading in the content areas, data-based decision making, writing in the content areas, formative assessment, continuous school improvement, effective instructional strategies, and afterschool teaching strategies. She is a coauthor of *Math in Afterschool: An Instructor's Guide to the Afterschool Training Toolkit*. Prior to joining McREL, Dana taught middle school and high school, served as the principal of a K–8 charter school, and worked as an educational consultant for the Coalition of Essential School and Expeditionary Learning Schools.

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