For too long, false perceptions—and often policy—have led teachers to believe they must choose between teaching reading and teaching content. As teachers, however, we know that for students to be successful in all subjects, they must have a strong foundation in reading and writing.

Reading for Learning: Using Discipline-Based Texts to Build Content Knowledge addresses this issue head-on, exploring the reality, which is that reading and content can, and should, go hand-in-hand to support subject area learning.

Drawing on research in human cognition, reading development, and discipline-specific pedagogies, Heather Lattimer provides practical, classroom-tested approaches to helping students access and critically respond to content-based texts, such as:

- Selecting texts that enhance student learning experiences
- Using strategies to help focus student readers before they engage with texts
- Supporting comprehension in content areas through discussion and writing
- Analyzing texts and applying content learning

Rich in classroom examples, the book strives not to remake content teachers into reading teachers, but instead to support content teachers in using texts to deepen students’ understanding of the core ideas, critical information, and ways of thinking in the disciplines.
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Introduction

For too long, content learning and reading instruction have been mired in a false dichotomy. The perception, and often the policy, has been that we have to make a choice between teaching reading or teaching content. The following recently observed announcement illustrates this misperception in action:

The principal cleared her throat and the room quieted. Faculty members shifted their attention away from summer vacations and toward the start of the school year. After a few brief introductions and announcements, the professional growth focus for the year was announced. “Our reading scores dropped again last year,” the principal began. “We are at risk of being designated as underperforming. Therefore, this year, all teachers will need to be teachers of reading.” A hand in the back immediately shot up. “Does this mean that teaching reading takes precedence over teaching all other content?” a science teacher challenged. The principal hesitated for a moment, knowing that she was about to alienate a significant portion of her faculty, including some of her best teachers. “Yes. Unfortunately, reading must take priority. We will have to set aside some of our content teaching in favor of teaching our students how to read.”

“Every teacher is a teacher of reading” started out with good intentions. It responded to the reality that all too often, students in middle and high school are unable to read and understand grade-level texts about subjects such as math, science, history, and the arts. It was intended to help students become better readers and learners across content areas (Fisher & Ivey, 2005). However, despite good intentions and a great deal of money, time, and effort, the “Every teacher is a teacher of reading” initiative has failed to result in reading gains, and it has not changed the way most content teachers practice their craft (see, for example, Lesley, 2004/2005; O’Brien, Stewart, & Moje, 1995).
There are many possible explanations for this failure, but at least one problem and cause for concern has to do with the unnecessary tension that the “Every teacher is a teacher of reading” mantra sets up. Many educators, like the principal in the previous vignette, see the choice as being about teaching content or reading. Content teachers, most of whom studied for years to become experts in their content area and few of whom have deep knowledge of literacy development, have been understandably frustrated by the demand that content take a backseat to general reading comprehension instruction. Many content teachers have resisted the push to become “teachers of reading,” responding that the demands of their content, the standards set out by the state, and the increasingly common subject-specific tests required of their students leave no time for reading comprehension instruction (O’Brien, Stewart, & Moje, 1995).

The battle lines that have been drawn, however understandable in light of the manner in which content reading policies have been carried out, are unnecessary. There doesn’t have to be a choice between reading or content. Reading and content can, and should, go hand in hand to support subject-area learning. This book is designed to provide a window into how to make that possible. It draws on research on cognition and learning, reading research, subject-specific research in history, science, math, and the arts, as well as on classroom practice and observation. It suggests practical, classroom-tested approaches to support students in developing content-specific understanding by using authentic, subject-appropriate readings. The goal is not to remake content teachers into reading teachers. Instead this book sets out to support content teachers in teaching students to access and use readings to deepen content understanding.

A note to teachers of English language arts (ELA): Although much of the discussion in this book focuses on exploring discipline-based texts that fall outside of the realm of literature, this book is for you too. Content standards across nearly all states, recommendations by the National Council of Teachers of English (NCTE) and the International Reading Association (IRA), and the 2010 Common Core State Standards all encourage ELA instruction that includes reading instruction in nonfiction, expository, persuasive, procedural, and technical texts. Bringing science-focused articles, historical documents, arts journals, charts, and math puzzles into the ELA classroom can be a wonderful way to meet these required standards.

Discipline-based texts can help develop students as readers who can navigate multiple genres and can also prepare them as writers who recognize the interplay between purpose, audience, and structure. Bringing readings from other disciplines into the ELA classroom also facilitates cross-content collaboration, an approach that has been found to raise both student achievement and teacher satisfaction (Bolak, Bialach, & Dunphy, 2005; Flowers, Mertens, & Mulhall, 1999). You are encouraged to read this book alongside colleagues from other disciplines, discuss common practices and content-specific differences, and identify ways to support one another’s work in the classroom.
The Intersection between Reading and Content Learning

Sam Wineburg has spent much of his academic career studying how historians work. His examination of expert historians in the midst of practicing their craft reveals the centrality of the use of texts to historians’ work as well as the unique character of reading in history. Accessing historical documents, according to Wineburg, is absolutely central to studying the past. “Reading,” he writes, “is not merely a way to learn new information, but becomes a way to engage in new kinds of thinking” (2001, p. 80). In a later article, Wineburg and colleagues explain further:

Understanding history requires understanding the processes integral to constructing historical narratives—the ways that historians analyze and compare fragmented, sometimes contradictory sources to create evidence-based narratives and conclusions. At the heart of these processes is reading—but reading informed by the ways of knowing in the discipline. (Martin, Wineburg, Rosenzweig, & Leon, 2008, p. 140)

To study history without reading and critically analyzing historical documents would be disingenuous. The same is true of most subject areas. Scientists, mathematicians, engineers, social scientists, artists, and performers all engage with texts that are appropriate to their content areas. Scientists do not develop theories or plan experiments out of thin air; they build on previous research, working to replicate, refute, refine, or reimagine earlier findings and apply that learning to new situations. Mathematicians, both theoretical and applied, read and study problems, look for patterns in data sets, and communicate, question, and defend proposed solutions. Artists and performers read to contextualize their work—to learn what came before and connect with the larger social, environmental, and political realities within which they work.

Yet for much of the history of US education, K–12 teaching focused on the acquisition of knowledge. Students in elementary, middle, and high school, it was believed, needed to learn “the facts” before they were ready to engage in subject-specific research and investigation; that should be left to the experts. It was under this conception of learning that content and reading were separated; content learning was about the acquisition of factual knowledge, while reading was about skill development. The two were not necessarily seen as related, nor were they understood to be mutually beneficial.

As we learn more about the nature of learning, it has become increasingly clear that true content learning is not simply about knowledge acquisition, rather it is about constructing understanding (Bransford, Brown, & Cocking,
2000; Vygotsky, 1978). If we want students to understand the causes of World War II, for example, we should not simply teach “the facts.” Instead, we should engage students in the process of uncovering the historical narrative. We should provide them with multiple primary and secondary sources, encourage them to critically analyze the texts, and provide structures within which they can debate their interpretations with peers to develop their own understanding of the causes of the war.

Under this conception of learning, reading is not separate from content learning, but is intimately connected. Texts are used to provide the material that students can explore, debate, analyze, and evaluate as they fit together multiple pieces of evidence to construct an understanding of the big ideas of history, science, mathematics, and the arts. Teachers move from being “knowledge givers” to “knowledge facilitators” (Grant, 2003); they frame debates and inquiries, select texts and activities, and structure opportunities for student engagement with the material. We are no longer teaching students that the core ideas of history, science, math, and the arts are “fixed and stable forever, dropped out of the sky readymade” (VanSledright, 2004, p. 232). Instead, we are inviting students to engage in the processes and practices of the disciplines, allowing them to see behind the proverbial curtain and to participate in the fascinating, challenging, and often messy process by which experts continue to generate knowledge in their fields. We see an example of this kind of teaching in the following classroom vignette. The names of all teachers and students in this text have been changed to honor their privacy.

Reading for Learning in the Science Classroom

When students arrived in Ms. Nguyen’s tenth-grade biology classroom, they found that the desks had been rearranged to accommodate a large, blue ice chest sitting on the floor in the middle of the room. As they quieted down and took their seats, they could hear strange noises coming from inside the chest. Wasting no time, Ms. Nguyen called for their attention as soon as the bell rang. “I need a volunteer,” she announced. “Come back,” she continued. “I don’t want to do that. I don’t know what’s in there. It might bite my hand off.” Eric started to walk back to his seat. “I don’t want to do that. I don’t know what’s in there. It might bite my hand off.”

“Thanks for volunteering, Eric,” Ms. Nguyen began. “I’d like you to put on this blindfold and then stick your hand inside the ice chest.”

Eric started to walk back to his seat. “I don’t want to do that. I don’t know what’s in there. It might bite my hand off.”

“Come back,” Ms. Nguyen said encouragingly. “It is perfectly safe. You aren’t going to get hurt. Trust me.” Eric continued to look skeptical. “What would it take for me to convince you to reach in?” Ms. Nguyen continued. “What evidence do you need before you are willing to trust my assertion that the ice chest is safe?”
Eric thought about it for a moment. “Can I look inside?” Ms. Nguyen shook her head. “Can I pick up the chest and shake it?” Ms. Nguyen agreed and Eric shook the chest. There was something inside. A few dull thuds could be felt as Eric moved the chest around, but there were no howls of protest. It didn’t seem to be alive. “Can I poke a stick inside if I keep my eyes closed?” Again Ms. Nguyen nodded her head. Eric covered his eyes and grabbed a ruler from a nearby desk and opened the lid a crack. The stick encountered what seemed to be a paper sack in one area of the cooler and on the other side a small hard object attached to the bottom. As Eric probed around a bit more the ruler struck some sort of button or knob on the object and the scratching and whining noises suddenly stopped. Eric grinned. “Okay, now I’m ready to reach inside, Ms. Nguyen.” He did so, withdrawing a paper sack of cookies as well as a small audio recorder that had been taped to the bottom of the cooler.

“Very nicely done, Eric,” Ms. Nguyen commented as Eric passed around the bag of cookies and returned to his seat. “I like that you were skeptical at first and that you wanted to investigate the evidence before you were willing to reach right in to the cooler. As you deduced, I was telling the truth when I said that you wouldn’t be hurt, but you were smart to question my assertion. That is what good scientists do. When someone has a new discovery or a colleague announces a new medical treatment, scientists initially remain skeptical. They question and probe, they attempt to replicate experiments, and they try to find other explanations or evidence that might have been missed. Good scientists are constantly asking, “How do we know when to accept an explanation as scientifically valid?”

“Today we’re going to investigate another assertion that was made over two hundred years ago. And I want you to follow Eric’s example and be similarly skeptical. Take a look at the statement on the screen” [see Figure 0.1]. “What do you think—would you allow this man to place fluid from a ‘diseased pustule,’ an infected sore, under your skin?”

“No way,” a student sitting next to Eric immediately spoke out. “I wouldn’t do it. I mean, he’s asking to make me sick. If I’m not sick now, why would I want to take something that could make me sick?”

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**How do we know when to accept an explanation as scientifically valid?**

It is 1796. A man comes to your farm with a strange request. He wants to cut your arm and place fluid from the pustule of a diseased person under your skin. He says that the fluid will cause you to develop a rash on your arms but promises that it will prevent you from getting a more serious disease. Do you accept his offer? Why or why not?

**FIGURE 0.1.** Ms. Nguyen challenged her students to consider when an explanation was scientifically valid.
“And why should we believe him?” another student wanted to know. “Do we know who this person is?”

“I want to know what diseases he’s talking about,” commented a young woman near the front of the room. “I mean, if one was like a cold and the other was like Ebola, I might be willing to try it. But I’d want to see more evidence first.”

“Good points,” Ms. Nguyen agreed. “I’ll fill you in a bit more and then provide you with some evidence to analyze. The man in this account is Edward Jenner, a country doctor in England. The fluid that he wants to place under your skin is from a cowpox pustule. And the more serious disease that he is hoping to prevent is smallpox, a highly contagious disease that has killed hundreds of thousands of people. Based on his previous observations, Dr. Jenner thinks he has found a way to prevent smallpox. He thinks that if he intentionally gives people cowpox, they’ll be safe from smallpox. In 1796 he was ready to test his assertion. He went to a local farmer and asked if he could inoculate the man’s son, James Phipps, with fluid from the cowpox pustule of a local milkmaid. Then, after the cowpox had run its course, Dr. Jenner wanted to intentionally infect James with fluid from a smallpox pustule.” Ms. Nguyen paused to make sure everyone was following.

“I want you to act as advisors to Mr. Phipps. I’m passing around a handout that includes some of the scientific evidence that Dr. Jenner had collected to support his explanation of the connection between cowpox and smallpox. The evidence is written in Jenner’s own words from 1798 and was published in a text called *An Inquiry into the Causes and Effects of the Variolae Vaccinae, or Cowpox*. There are also spaces on the paper for you to respond to this text [see sample, Figure 0.2]. I want you to interrogate Jenner’s observations, much as his colleagues did at the time. Ask questions, consider other explanations, shake them around, and poke a stick at them. And then decide: Do you know enough to accept

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**FIGURE 0.2.** Ms. Nguyen’s students responded to excerpts from Jenner’s written observations about cowpox as a vaccine.
Dr. Jenner’s assertion? Can we accept his explanation as scientifically valid?”

The class worked through the first two pieces of evidence together. Before she asked students to read on their own, Ms. Nguyen wanted to provide them with some clues for accessing the eighteenth-century language. She also wanted to model for them the kinds of critical questions they should be considering as they read. She read each quote aloud and then engaged students in the process of thinking through the explanation. “Let’s take it one sentence at a time,” she suggested, and then used prompts like these to guide students: “Tell me what it means in your own words.” “Pay attention to his choice of words.” “How is he relating those two pieces of information?” “What do you think he’s asserting?” Once satisfied that students understood the intent of Jenner’s statement, Ms. Nguyen pushed them to consider alternative explanations: “Are there any other ways that information could be interpreted?” “What evidence might Dr. Jenner have missed?” “Is this conclusive proof?”

Ms. Nguyen then released students to work with peer partners to read through and interrogate the remaining quotes. She moved around the room to answer questions about unfamiliar language, encourage thoughtful collaboration between peers, and remind students to probe for weaknesses in the evidence and consider alternative explanations (see question prompts, Figure 0.3). “I want them to hear those questions in their heads,” she told me after the class had ended. “I want them to practice using them now so that when they encounter journal articles or reports of science in the popular media later they can critically analyze the claim and the evidence.”

She went on to explain the thinking behind this lesson more generally: “Dr. Jenner’s treatise is a great example of scientific inquiry at work,” she told me. “He states his claim and then methodically lays out his evidence, case by case. It’s a lot less dense than a modern medical journal article, but it follows the same basic principles. It’s great for beginning biology students because they can read the cases and analyze the evidence just like Jenner’s contemporaries likely did. And it also helps us to springboard into our unit on viruses and the immune system. By the time they open their textbooks, these students have already developed an initial understanding of immune

### Interrogating Science Texts: Questions to Consider

1. **Comprehend the statement**
   - What has been observed?

2. **Understand the explanation**
   - How are the observations connected?
   - What is the author asserting?

3. **Interrogate the text**
   - Are there other ways that the observations could be explained?
   - What evidence might we be missing?

*FIGURE 0.3.* Ms. Nguyen provided students with prompts to guide their work with Jenner’s text.
reactions. They’re able to make connections between Jenner’s work and present-day scientific understanding. It makes the content reading much more meaningful.”

After about twenty minutes, a change in the noise level in the room indicated that most students had finished interrogating the reading. Ms. Nguyen called the class together. “What do you think?” she queried. “Does Dr. Jenner’s evidence support his assertion? Should we accept his explanation that being inoculated with cowpox will protect people against smallpox?”

“I think so,” a student near the back of the room volunteered. “The cases seem pretty convincing. In each of them someone gets sick with cowpox and then later doesn’t get sick with smallpox.”

“I don’t know,” another student countered. “The results weren’t always consistent. Some people who’d had cowpox didn’t get sick at all with smallpox, while others got high fevers. How can you be sure that you would be safe?”

“Okay, yeah, some of the people got sick,” a young woman responded. “But at least no one died of the disease. The worst that happens in each of these cases is a bad fever and rash. We know smallpox was deadly. So even if the cowpox makes you only partially resistant, it’s still worth it if it keeps you alive.”

The discussion went on like this for several minutes with consensus growing that the preponderance of the evidence was in Dr. Jenner’s favor. Ms. Nguyen then returned to her earlier question. “Based on these observations, would you allow Dr. Jenner to inoculate you with cowpox? What would you advise Mr. Phipps? Should he let Dr. Jenner inoculate his son?”

The students hesitated. Although most believed that the connection between cowpox and smallpox had merit, they were still hesitant to act on this belief. “I think maybe I’d want him to do it to someone else first,” one student said, speaking for much of the class. “Someone nearby. Then I could watch and see what happened for myself before I’d agree to do it.”

Ms. Nguyen explained that Dr. Jenner did indeed go on to vaccinate James Phipps with cowpox, which caused a slight fever but no great illness. Later, when he was repeatedly exposed to smallpox, James Phipps showed no signs of infection. This event, along with the other evidence that Dr. Jenner had collected, eventually helped to convince the Royal Medical Society that vaccination with cowpox would protect people against smallpox, and in 1840 the British government began providing the vaccinations free of charge. In 1980 the World Health Organization declared that smallpox had been eradicated.

Before the bell rang to end the period, Ms. Nguyen had one final request. “I want to go back to the question that framed our discussion: How do we know when to accept an explanation as scientifically valid? Dr. Jenner faced a lot of skepticism and a lot of questions, but it turned out that he was right about cowpox and smallpox. Should people just have accepted what he said? Or were they right to question him? When should we decide that a claim is scientifically valid?”

“I think that they should have questioned him,” a young woman near the front of the room commented.

“Just because someone says it is true, you can’t automatically believe it. If we did that then there’d be a lot of problems because a lot of people could make mistakes or jump to conclusions that weren’t valid.”

“I agree,” responded a young man. “It’s like someone said earlier, you can’t just believe it because there’s one or two examples. You have to question and you have to be able to see lots of evidence.”

Eric, the young man who had volunteered to reach his hand inside the ice chest at the beginning of the period, got the last word. “I don’t know that we can ever know for sure that something is going to be absolutely true all of the time. But if there’s a lot of evidence and if a lot of scientists examine the evidence and ask questions and no other possibilities seem likely, then it seems like you have to accept it. If we never accepted new explanations then we’d never have any progress.”
Characteristics of Classrooms That Support Reading for Learning

Content classrooms that effectively use reading to support content learning, such as the one profiled in the preceding vignette, share several common characteristics. These characteristics, which will be described in the following sections, are grounded in educational theory and research. They don’t look the same in every classroom or content area, but they inform the manner in which teachers plan and organize instruction and assess student learning across disciplines. These characteristics provide a foundation for the concepts, strategies, and classroom examples that are described in the later chapters of this book. An understanding of these characteristics helps teachers integrate reading as a critical part of content teaching and learning and prevents strategies from becoming isolated activities.

The Goal Is Understanding

In the widely read curriculum design text Understanding by Design, educators Grant Wiggins and Jay McTighe (2005) differentiate between knowledge and understanding. Knowledge, they argue, is having command of a set of facts that can be used to respond on cue to prompting by others. Understanding, on the other hand, is less concerned about individual pieces of knowledge and is more focused on mastery of the core concepts of a discipline. Someone who has understanding is able to strategically interact with new information and ideas, recognize the meaning and relevance of material, make connections, ask questions, and articulate the reasoning behind their assertions.

Content reading that supports content learning provides opportunities for students to develop their understanding. The texts that are selected and the lessons that are designed to incorporate those texts work in support of learning about and interacting with the core concepts of the discipline. Reading is not done simply in the service of acquiring information; indeed, if that is the only purpose for reading, it can be argued that there are more efficient and effective means of gathering facts (Fisher & Frey, 2008). Instead, content reading for content learning opens opportunities for students to build conceptual understanding through critical analysis and application.

In the earlier example, Ms. Nguyen responded to the goal of building understanding by encouraging her students to interrogate Dr. Jenner’s assertions. She wanted them to develop a conceptual understanding of viruses and the immune system and to understand the nature of scientific inquiry. Many students graduate from high school not realizing that science is a process and that
our understanding of science is always evolving. This unfortunate reality is a by-product of courses and texts that present scientific knowledge as something to be memorized and regurgitated (J. J. Gallagher, 2007). Ms. Nguyen designed her lesson to counter that perception. By exposing her students to Dr. Jenner’s writing and having them interrogate his claims, she provided opportunities for them to recognize that the theories we accept as valid today were once up for debate. She reinforced this lesson during subsequent class meetings by providing opportunities to examine other scientific studies, both past and present, and encouraging students to maintain a similarly skeptical stance when they were collecting and analyzing data in their own lab activities. For those students who decide to pursue advanced study of science in college and beyond, this kind of work prepares them to participate in the discourse of the scientific community. And for all students, regardless of what field they choose to pursue, critical reading of texts teaches them to be thoughtful consumers of popular scientific information and more appreciative of the rigorous examination that ideas are subjected to before they are recognized as accepted theories.

Teaching for understanding requires that teachers have a clear vision of their learning goals when planning lessons, selecting texts, and implementing instruction. Ms. Nguyen’s lesson was powerful not only because she had found a great text, but also because she was able to engage students with that text in a manner that supported her learning goals. She followed what Wiggins and McTighe (2005) describe as a “backward design” approach, beginning her planning with the end in mind. She knew she wanted students to understand the core concept of scientific inquiry. She crafted a powerful essential question around which to build her lesson: “How do we know when to accept an explanation as scientifically valid?” And then she planned learning experiences that would allow her students to explore this question with richly layered materials appropriate to her content standards. Wiggins and McTighe advocate for the use of essential questions as a means to maintaining a deliberate focus on the big ideas of the discipline. Other strategies for maintaining focus on core concepts when planning instruction and selecting texts include organizing around case studies, an approach increasingly common in medicine, law, and other professional schools, and building units that focus on project-based learning (Thomas, 2000; Markham, Larmer, & Ravitz, 2003).

**Instruction Is Inquiry Driven**

Classrooms that use reading to support content learning are grounded in an inquiry stance. Inquiry approaches to instruction build on work by cognition
researchers, including Bruner (1966), Piaget (1971), and Vygotsky (1962), who argue that learning does not take place by transmission of information from teacher to student, but rather through student engagement with new ideas and information in a manner that allows the construction of individual and community understanding. Facilitating this construction of understanding in the classroom means that we, as teachers, need to ask authentic questions or pose real-world problems that are appropriate to our field and engaging for our students. And that we then need to allow students to investigate those questions and problems through reading, writing, problem solving, discussion, and debate (Brooks & Brooks, 1999).

Ms. Nguyen’s use of the Jenner text illustrates the application of an inquiry approach. Before the students began reading, she posed a dilemma: “There’s a deadly disease out there. Do you take a risk and expose yourself to a potential treatment?” She encouraged students to take a position in response to the dilemma. She required them to interrogate potential supporting evidence in the reading. And, in subsequent lessons, she helped students make connections between the Jenner text and current informational readings on present-day scientific knowledge. During these lessons, students read materials not to answer questions at the end of the textbook, but to respond to a real concern and to weigh the validity of potential evidence.

Strong inquiry provides guided opportunities for students to engage with an authentic question or concern, learn more about that question or concern, connect their new learning to their existing schema, and respond in a manner that is appropriate for the content and audience. Engaging students in inquiry provides real reasons for reading texts and engaging with classroom material. It increases students’ motivation for reading by tapping into intrinsic curiosity and a desire to learn rather than relying solely on extrinsic threats and rewards (Deci, 1996; Jensen, 2005). Reading the text matters not just because a teacher tells them to read it, but because the texts address compelling questions that have resonance both within and beyond the classroom.

**Reading Opportunities Are Authentic**

In classrooms where content reading supports content learning, reading opportunities reflect the real-world work of practitioners within the discipline. Students read texts and ask questions that approximate what the experts do. In history classrooms, for example, students don’t just read the history textbook; they engage with primary source documents as well. In a math class, knowledge gained from reading procedural texts applies beyond the problem set at the end
of the chapter and connects to real-world applications. Texts are read critically, with an understanding that no text is neutral, that every reading contains bias, and that readers need to consider multiple interpretations (Alvermann, Moon, & Hagood, 1999; G. Johnson, 1999).

The concept of authenticity within the school setting has gained popularity in recent years in response to several important influences. Nancie Atwell, in her seminal work *In the Middle* (1998), built on research by Donald Graves (2003) and Donald Murray (2003), among others, to emphasize the idea that students should read and write as real-world readers and writers. She encouraged classroom structures and instructional techniques that would allow for students to talk about their reading, receive focused strategy lessons, revise and publish their writing, and, perhaps most important, have *time* to read, write, talk, and think within the school day.

Deborah Meier (2002), working to recraft secondary education at Central Park East East Secondary School in New York, and Ted Sizer (2004), founder and director of a network of small schools called the Coalition of Essential Schools, emphasized the role of authenticity in assessment. They called on schools to engage students in real-world projects, portfolios, and presentations—to use performance-based assessments to drive the curriculum in the school rather than continue to be beholden to external and artificial tests.

Increasingly, content educators have followed the examples of Atwell, Meier, and Sizer and have suggested that engaging students as historians, scientists, mathematicians, and artists will provide more meaningful learning opportunities and better prepare students to participate in academic and professional communities. Nearly all discipline-based state standards, as well as content standards adopted by national professional associations such as the National Council of Teachers of Mathematics (NCTM), National Science Teachers Association (NSTA), and the National Council for the Social Studies (NCSS), include specific process standards that address the need to prepare students in the *ways of thinking* within the discipline.

In the preceding example, Ms. Nguyen worked to introduce her students to ways of thinking appropriate to science. They read and responded to Dr. Jenner’s recorded observations, weighed the evidence, and considered alternatives. Such practices align with the work of scientists reviewing research studies prior to publication. Before findings are accepted as credible and are ready for publication, they must go through a peer-review process and be scrutinized against scientifically acceptable norms. Although Ms. Nguyen’s students certainly weren’t Jenner’s peers, they nevertheless were engaging in a similar process.
Instruction Is Explicit

Content teachers who effectively use reading to support content learning provide explicit instruction in the skills, strategies, and ways of thinking used within the discipline. Many of us, steeped in our fields for years of study (and having chosen our fields because we were comfortable and confident within the subject area), don’t realize just how much cognitive skill goes into the process of investigating a topic, solving a problem, or reading a content-specific text. We assume that if we can do it, students should be able to do it too if we provide them with easier investigations, less rigorous problems, or shorter texts. But simply assigning “easier” material does not necessarily make the cognitive tasks less complex, nor support students in learning the skills they need to become proficient in the skills, strategies, and ways of thinking of the discipline. Kylene Beers, a reading researcher who works with underperforming students, writes,

It is important to remember that we can teach students how to comprehend texts. We shouldn’t assume that if we simply explain what something means, students will automatically know how to comprehend other texts. To help dependent readers become independent readers, we must teach them what many of us, as independent readers, do with seemingly little effort. We must teach them strategies that will help them understand texts. (2003, pp. 40–41)

Effectively teaching students how to comprehend and respond to a text involves the following elements.

A Clear and Narrow Focus
Readers don’t have to read, analyze, apply, and respond to a whole text all at once. The strongest learning occurs when students have multiple opportunities to engage with challenging texts and can gradually work to uncover meaning. Focus students’ reading on a single task for each reading. In Ms. Nguyen’s class, students read first to paraphrase information into their own words, and then returned for a second reading to evaluate the strength of the evidence and consider alternate explanations. By focusing on one cognitive task at a time, students are able to dig deeper into material and develop a stronger understanding of the texts and content concepts (J. Allen, 1995, 2000).

Opportunities for Modeling and Application
If students are to begin to approximate the behaviors and ways of thinking of content experts, they need to see content experts at work. In the classroom, this means that we must model our processes of reading, thinking, and making sense.
of texts. We need to think out loud about our process, guiding students through the steps that we go through to make meaning of text. Nancie Atwell refers to this type of classroom demonstration as “taking off the top of my head,” and describes it as a critical part of making the invisible and often confusing process of reading accessible for students (1998). Ms. Nguyen took off the top of her head by modeling the questions that a good reader asks. She encouraged student input through an interactive read-aloud and then provided opportunities for them to use the same questions to guide their independent reading. Close connection between the teacher’s model and targeted application opportunities helps set up students for success in using reading to support content learning.

Assessment for Learning

There is a critical difference between assessment of learning and assessment for learning. Traditionally in content classrooms we have used the former approach. We teach a series of lessons, assign a number of readings or problem sets, and then give a final assessment. That test, essay, or project is assumed to represent a student’s learning, the student is assigned a grade, and then we move on to the next unit. The difficulty with this approach is that too much gets wrapped up in that one final assessment. Success is determined by multiple factors, including how well students took notes, read texts, and listened to lectures and how well they were able to represent their understanding on the test, essay, or project, as well as how they felt that day and how distracted they were from the conversation they just had in the hallway during passing period. It can be nearly impossible, based on an end-of-unit summative assessment, to parse out what students know and are able to do, what new challenges they are prepared for, and where they might need additional support. Not to mention the fact that, at the end of the unit, it’s time to move on and there’s not usually an opportunity to go back and respond to student strengths and needs from the previous unit anyway.

Assessment for learning, also known as formative assessment, describes activities that take place as a regular part of classroom instruction and that allow us to assess student learning in progress. Assessments for learning help us recognize what students have mastered and where they need help. They allow us to respond by working to shore up areas of weakness and build on areas of strength within the unit before we move on to new concepts or skill learning. Educational Testing Service researchers Leahy, Lyon, Thompson, and Wiliam note,

In a classroom that uses assessment to support learning, the divide between instruction and assessment blurs. Everything students do ... is a potential source
of information about how much they understand. The teacher who uses assessment to support learning takes in this information, analyzes it, and makes instructional decisions that address the understandings and misunderstandings that these assessments reveal (2005, p. 19).

Teachers who effectively use reading to support content learning build assessment for learning into their classrooms. They use assessment to identify challenges in comprehension, recognize where conceptual understanding breaks down, and track student progress in learning to analyze texts and apply learning. Ms. Nguyen, for example, was able to use students’ responses to Dr. Jenner’s quotes to assess how well they could read and understand the technical writing used in the text, consider explanations, and ask critical questions. That information helped her to recognize students’ strengths and weaknesses, design future whole-class instruction, and provide targeted support to individuals or groups of students who needed additional assistance.

Thinking about Thinking

It is likely impossible to fully prepare students with all of the scientific, mathematical, historical, artistic, and other discipline-related knowledge that they might need throughout their lives. Even if time were not an issue and students came ready to learn every day, there is simply too much subject-area knowledge for students to learn everything. What we can do, however, is teach students how to learn within our disciplines. This requires teaching processes, showing them how to inquire, and modeling the processes of content experts. It also requires stepping back with some regularity to have students reflect on their own learning and development. At the end of Ms. Nguyen’s lesson, she asked students to reflect on the essential question, How do we know when to accept an explanation as scientifically valid? In later lessons, after the class interrogates other journal articles or analyzes their own research data, she would revisit the question, and would push students to reflect on their evolving understanding by asking: How has your thinking changed? What caused the change? What questions or concerns do you still have? The metacognitive process of thinking about thinking, recognizing and responding to strengths and weaknesses in our own learning, and adapting our knowledge and skills to fit new circumstances helps students learn more within the confines of our classroom and empowers them to become independent learners once they leave us.
A Preview of What’s to Come

The chapters that follow in this text provide specific suggestions for effectively using reading to support learning in the content classroom. Chapter 1 addresses text selection and the need to choose readings that are central to the focus of study, authentic to the content, and accessible for students. Chapter 2 focuses on preparing students to be successful in their reading by providing a context and purpose. Chapter 3 examines four ways to support comprehension. Chapter 4 addresses the development of academic language. And Chapter 5 describes techniques for moving beyond basic comprehension to deepen students’ conceptual understanding through analysis and application. Each of these chapters includes specific strategies and classroom examples that detail strategies in use. At the end of Chapters 2 through 5, you’ll find a special section that addresses assessment strategies, learnings, and next steps for the classroom examples highlighted in the chapter.

The ideas and information in the chapters build on a solid foundation of reading research and learning theory. In addition, they reflect my experience as a classroom teacher, instructional coach, and education professor. Over the past fifteen years, I’ve taught high school history and middle school math. I’ve also worked as a math resource teacher and a literacy coach, and I currently teach at the university level. Since leaving my own secondary school classroom seven years ago, I’ve been privileged to have the opportunity to observe, teach, co-teach alongside, and provide support for middle and high school teachers in a range of disciplines.

Having a diverse set of experiences working in a range of roles and content areas has helped me to appreciate the multiple ways in which content teachers can be effective. The strategies profiled in this text are not one-size-fits-all prescriptions. The examples are not recipes to be copied. Teachers should adapt the ideas and approaches to fit the demands of their content areas and the particular needs of their students. There are many ways to support student learning in the classroom. I hope that this text will provide a few new ideas to add to your repertoire.
For too long, false perceptions—and often policy—have led teachers to believe they must choose between teaching reading and teaching content. As teachers, however, we know that for students to be successful in all subjects, they must have a strong foundation in reading and writing.

Reading for Learning: Using Discipline-Based Texts to Build Content Knowledge addresses this issue head-on, exploring the reality, which is that reading and content can, and should, go hand-in-hand to support subject area learning.

Drawing on research in human cognition, reading development, and discipline-specific pedagogies, Heather Lattimer provides practical, classroom-tested approaches to helping students access and critically respond to content-based texts, such as:

- Selecting texts that enhance student learning experiences
- Using strategies to help focus student readers before they engage with texts
- Supporting comprehension in content areas through discussion and writing
- Analyzing texts and applying content learning

Rich in classroom examples, the book strives not to remake content teachers into reading teachers, but instead to support content teachers in using texts to deepen students’ understanding of the core ideas, critical information, and ways of thinking in the disciplines.