The bell rang, and the 30 high school juniors took their seats at the chemistry lab tables. Mr. Davis knew that he had to grab their attention right away. “Are you an acid or a base? That’s the question of the day.” Students looked at him. Some raised their eyebrows as they waited to hear what was next. “And to answer that, you’ll be testing your saliva.” Some of the students said “ewwww,” but they kept their eyes on Mr. Davis. They had recently learned about the structure of different substances, and today they would be learning the difference between an acid and a base.

“Before you begin the experiment, we’ll be going over the procedure on page 52 of your textbook.”

They took out their textbooks, which were too difficult for most of them. Mr. Davis knew this, so he had carefully structured activities that would support student literacy as they learned content. First, he showed the students the text, and he pointed out the headings that divided the text into an introduction and a two-part procedure.

He began reading. As he read the first part of the introduction aloud, he modeled a technique that his students had used before—Reciprocal Teaching. With Reciprocal Teaching, students engage in a series of reading strategies. They make predictions about the upcoming text. Then, after reading a section of the text, they ask for clarification about unknown words, ask questions about the content, and summarize the text. To model Reciprocal Teaching, Mr. Davis read a paragraph of the textbook aloud to the class, and then he paused to summarize and clarify terms in the text (“litmus,” “phosphorus”). He asked students a question to see if they understood and challenged them to think about how they might test for acidity.

Mr. Davis then directed the students to break into lab groups and use Reciprocal Teaching to read the procedure together. He and his students both enjoyed this method. They could talk to each other, and the talk was focused on understanding what to do for the experiment. As he walked around and checked in with the groups, he knew that they would be ready to carry out the procedure and effectively conduct the experiment.

In this scenario, Mr. Davis is committed to both teaching essential content and helping his students gain access to the text. He, like many of his colleagues, has repeatedly heard the saying: “Every teacher is a teacher of reading.” He loves science, but he noticed that year after year students arrived in his class without the literacy skills that are necessary to understand what they read. And in science, that meant they made some serious, even dangerous, mistakes in their lab experiments.

Mr. Davis did, in fact, recognize a crisis—one that includes all adolescents, from advanced students to struggling readers. Both standardized test scores and reports from teachers in the classroom attest to the fact that many adolescents struggle to read, especially when facing
expository, content area text. What can teachers do? Studies suggest a common solution that is in reach of all teachers—to embed literacy into content area instruction (Biancarosa & Snow, 2004; Kamil, 2003). This chapter explains the challenge and describes a practical solution to address the crisis—Literacy in Context (LinC).

**PAUSE and REFLECT 1.1**

Consider your experiences with advanced, proficient, and struggling readers in grades 5 through 12. From these experiences, what conclusions can you draw about the state of adolescent literacy?

**UNDERSTANDING THE CHALLENGE**

The call to action began when adolescents’ performance on standardized tests revealed that many middle and high school students were not proficient readers. Prompted by this information, researchers and educators identified some of the unique demands of content reading and shared possible solutions.

**Troubling Statistics**

In 1998, *The Nation’s Report Card* revealed that just 33 percent of eighth-grade students and 40 percent of twelfth-grade students performed at or above the proficient level in literacy (Donahue, Voelkl, Campbell, & Mazzeo, 1999). A year later, the International Reading Association released a position statement acknowledging that adolescent literacy deserved some attention (Moore, Bean, Bridyshaw, & Tycik, 1999). Since the late 1990s, adolescent literacy has gotten some attention, so much that it has earned the title of “Hot Topic” from the International Reading Association every year from 2007–2010 (Cassidy & Cassidy, 2010). Much of the attention to the topic is a result of troubling statistics.

- Sixty-nine percent of all eighth graders are below the proficient level in their ability to comprehend text written at their grade level (Lee, Grigg, & Donahue, 2007).
- For high school students, scores on the *Nation’s Report Card* were the lowest they had been since 1992 (Grigg, Donahue, & Dion, 2007).
- In typical high poverty schools, half of the incoming ninth graders read at sixth or seventh grade level (Balfanz, McPartland, & Shaw, 2002).
- Eight million students in grades 4 through 12 are struggling readers (Grigg, Daane, Jin, & Campbell, 2003).

A surprising number of students enter high school without the skills and strategies that are necessary to face the rigors of reading in their content area classes. Once in high school, they continue to struggle in all high school courses, missing the opportunity to engage in learning and thinking. Many struggling readers drop out of school. In fact, readers who score in the bottom quartile of standardized tests are 20 times more likely to drop out of high school than proficient readers (Carnevale, 2001). And those who do go to college often need remediation. Over half of all college students need to take remedial courses to learn the skills they did not learn in high schools (Wirt, et al., 2001). These students are not prepared for the demands of content reading.

**The Demands of Content Reading**

To understand the challenge, it is critical to be aware of the content reading demands placed upon adolescent learners. Reading is a complex process in which the reader constructs meaning from the text. When reading content-rich materials, students face a challenging task. As students read the text, they must learn new concepts and consider the meaning of complex ideas. In middle and
high school, the concepts in each domain increase in complexity. As a result, content area literacy becomes more specialized as students become more engaged with different disciplines.

Broadly defined, literacy is the ability to identify, understand, interpret, create, communicate, compute, and use printed and written materials associated with varying contexts (National Institute for Literacy [NIFL], 2009). In learning from a text, students gradually move from basic literacy, to intermediate literacy, to disciplinary literacy (Shanahan & Shanahan, 2008). Basic literacy includes skills such as decoding that give a reader access to print and help them break the code of text. Intermediate literacy involves learning to comprehend texts of different types and learning literacy strategies that cross domains. Disciplinary literacy is a specialized literacy that occurs in a discipline. When students are thinking like a historian, scientist, or mathematician, they are engaging in disciplinary literacy.

Effective instruction in content reading gradually moves students from basic literacy to disciplinary literacy. This instruction occurs within each domain. National content standards in various disciplines define what students need to know and be able to do in order to be literate within that domain. For example, the National Science Standards state that for an individual to be scientifically literate, he or she must be able to ask questions about everyday experiences, describe natural phenomena, read with understanding, and engage in conversations about the validity of the reading (National Academy of Sciences, 1995). According to this definition, literacy is an integral part of science education.

How can teachers move students toward disciplinary literacy, specifically reading literacy? When considering effective instruction for content reading, four particular elements of reading emerge: comprehension, vocabulary, fluency, and motivation (National Association of State Boards of Education, 2006). Each of these areas poses challenges for adolescent readers when they approach content text.

**COMPREHENSION** Many adolescents can read words but struggle to fully comprehend what they read (NIFL, 2009). For the purpose of this book, reading comprehension is defined as the process of using one’s own prior knowledge and the writer’s cues from the text to infer the author’s intended meaning (Irwin, 1991).

Content area text requires strategic reading that is sustained and intentional. Proficient readers know when and how to use reading strategies, and they have the flexibility to adapt them to different reading contexts (Afflerbach, Pearson, & Paris, 2008). For example, reading in the social sciences requires that students comprehend, analyze and compare texts. Reading in chemistry requires that students understand important interactions and processes. In math, reading is used to evaluate and interpret mathematical ideas. In each subject area, students must learn to go beyond what is said on the page to process and build a broad meaning of the text.

**VOCABULARY** The difficulty of the words, or the vocabulary, in content text poses challenges for readers. The text is filled with terms that represent new concepts. In addition, there are familiar words that are used in different ways and academic language that is found in school subjects but not in everyday communication.

Research in reading has consistently shown the strong, positive relationship between reading comprehension and vocabulary knowledge (Baumann, Kame’enui, & Ash, 2003). Adolescents’ comprehension can be challenged or strengthened by the difficulty of language in content area text. Proficient reading requires a complete and flexible knowledge of vocabulary words (Nagy & Scott, 2000). Words in content texts might be familiar, but their meanings change when they appear in a different context. To succeed with content area text, adolescents need to build their vocabularies as they build conceptual understanding.

**FLUENCY** Fluency involves reading a text accurately, at an appropriate rate, with appropriate expression. The sentence structure, word choice, and use of punctuation in content texts challenge even the most experienced reader.
While fluency is often a part of elementary reading instruction, it is often missing from middle and high school instruction (Rasinski, Padak, McKeon, Wilfong, Friedauer, Heim & 2005). However, research shows that fluency continues to develop as students are exposed to new and varied texts (National Institute of Child Health and Human Development [NICHD], 2004). As students delve more deeply into subject areas, they need to be given opportunities that foster their fluency, strengthening their proficiency with reading text aloud. In addition, research shows a strong correlation between fluency and comprehension, suggesting that fluent readers have more cognitive space that would free them to focus on building meaning from text (LaBerge & Samuels, 1974). Adolescent readers who struggle with fluency also struggle with comprehension (Rasinski et al., 2005). Fluency instruction should continue as students learn to read content.

**MOTIVATION**  
Motivation is a process by which a goal-directed activity is both instigated and sustained (Schunk, Pintrich, & Meece, 2008). In general, as students progress through the grades, their motivation and engagement in school experiences decline (Keene, 2007). Content reading poses particular motivational challenges. Reading an algebra, chemistry, or world history text is likely the most difficult reading that a student has ever experienced. Adolescent readers, and readers in general, are likely to sustain attention if they value the reading task and believe they will be successful (Guthrie & Wigfield, 1997). Thus, one of the most important jobs of a teacher is to help students find value in their academic reading.

It is not surprising that motivation is also strongly connected to reading comprehension (Alvermann, 2002). Proficient content readers are able to sustain reading and apply strategies necessary to build vocabulary, fluency, and comprehension. As students continue to engage in content reading, they become more skilled and strategic. They see themselves as better readers, and they want to read. If a student, for whatever reason, is not motivated to read, he or she will not have the sustained attention that is needed to engage in content reading and gain important practice with understanding text. Initiating and sustaining students’ motivation is a critical goal for every content teacher; without it, literacy development will not occur.

Each of these demands of content reading—comprehension, vocabulary, fluency, and motivation—needs to be addressed when focusing on adolescent literacy development.

**Possible Solutions**

A number of research briefs, written by researchers, educators, and policy makers, make recommendations to address the crisis in adolescent literacy. Figure 1.1 lists eight reports, a representative sample of the many that include possible plans of action for states, districts, and teachers, to assist in program design and selection of research-based strategies.

One of these reports, *Reading Next* (Biancarosa & Snow, 2004), presented results of research that studied school programs designed to foster adolescent literacy. After identifying and examining exemplary programs, they noticed 15 elements that these programs shared. These 15 elements, shown in Figure 1.2, include characteristics of classroom instruction and characteristics of the school context—both of which are important in supporting literacy development. Each of these elements provides guidance for educators and administrators who are committed to supporting literacy growth in adolescents. *Reading Next* suggests that teachers embed effective reading instruction in the course content (Biancarosa & Snow, 2004). However, to enact these important practices, teachers need a supportive context that includes such elements as the opportunity to meet with colleagues to plan instruction.
<table>
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<th>Title</th>
<th>Author/Year</th>
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<tr>
<td>1. Academic Literacy Instruction for Adolescents: A Guidance Document from the Center on Instruction</td>
<td>Torgesen et. al, 2007</td>
<td>To offer researched-based recommendations, advice from experts, and descriptions of successful programs to help improve content literacy.</td>
<td>The Center on Instruction <a href="http://www.centeroninstruction.org">www.centeroninstruction.org</a></td>
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<td>2. Effective Instruction for Adolescent Struggling Readers: A Practice Brief</td>
<td>Boardman et. al, 2008</td>
<td>To provide best practices for struggling adolescent readers.</td>
<td>The Center on Instruction <a href="http://www.centeroninstruction.org">www.centeroninstruction.org</a></td>
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<td>3. Double the Work: Challenges and Solutions to Acquiring Language and Academic Literacy for Adolescent English Language Learners</td>
<td>Short &amp; Fitzsimmons, 2007</td>
<td>To identify the challenges faced by adolescent English learners, and to outline recommendations to address those challenges through teaching practices, professional development, research, and policy changes.</td>
<td>Alliance for Excellent Education <a href="http://www.all4ed.org">www.all4ed.org</a></td>
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<td>4. Interventions for Adolescent Struggling Readers: A Meta-Analysis with Implications for Practice</td>
<td>Scammacca et. al, 2007</td>
<td>To describe reading interventions that lead to positive results for struggling adolescent readers.</td>
<td>The Center on Instruction <a href="http://www.centeroninstruction.org">www.centeroninstruction.org</a></td>
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<tr>
<td>5. Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement</td>
<td>Heller &amp; Greenleaf, 2007</td>
<td>To outline recommendations focused on developing advanced literacy skills and provide guidance for the strategies necessary in each academic discipline.</td>
<td>Alliance for Excellent Education <a href="http://www.all4ed.org">www.all4ed.org</a></td>
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<tr>
<td>7. Reading Next: A Vision for Action and Research in Middle and High School Literacy</td>
<td>Biancarosa &amp; Snow, 2004</td>
<td>To guide projects focused on adolescent literacy—identifying what works, when it works, and for whom it works</td>
<td>Alliance for Excellent Education <a href="http://www.all4ed.org">www.all4ed.org</a></td>
</tr>
<tr>
<td>8. Writing to Read: Evidence for How Writing Can Improve Reading</td>
<td>Graham &amp; Hebert, 2010</td>
<td>To offer specific instructional practices for helping adolescents develop writing proficiencies which in turn help them to improve their reading abilities.</td>
<td>Alliance for Excellent Education <a href="http://www.all4ed.org">www.all4ed.org</a></td>
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**FIGURE 1.1**  Documents Guiding Adolescent Literacy Instruction
TEACHING LITERACY IN CONTEXT: THE LinC CYCLE

This text uses the Literacy in Context (LinC) Cycle to illustrate how literacy can be taught in the context of content instruction. The model supports Reading Next (Biancarosa & Snow, 2004) in that it includes both instructional strategies for the teacher and tools to support the use of best practices. The LinC Cycle is not a “new program.” It takes the thinking of expert teachers of content and literacy and makes it explicit. So often teachers are handed a book of 50 or 100 strategies for teaching content reading, but rarely do teachers have an opportunity to see the process of how and why teachers choose and use these strategies.

Teachers who use the LinC Cycle engage in four connected steps: Assess, Reflect, Plan, and Teach. Figure 1.3 shows the LinC Cycle. Teachers begin the process with assessing student literacy needs and reflecting on students’ strengths and areas for growth. Based upon this information and the knowledge of strategies to address these needs, teachers create a LinC Teaching Plan that incorporates best practices for literacy instruction. After teaching, formative assessment helps the teacher decide next steps for instruction.

Assess

To assess is to gather evidence of student learning. With the LinC Cycle, the purpose of assessment is to inform instruction. The LinC Cycle promotes balanced literacy—an approach to literacy instruction that focuses on student needs (Reutzel & Cooter, 1996). Teachers identify the students’ learning needs before making decisions about what to teach.

As the previous section explains, many factors contribute to reading performance and student learning, including language proficiency, vocabulary, fluency, comprehension, and motivation. However, because of the demands on teachers’ time, it is nearly impossible to use the available data in a productive way. The LinC Cycle attempts to make the process more manageable. It includes assessments that can be conducted by teachers who are not certified reading specialists, but who are committed to the literacy growth of their students.

The commitment to using data fits with two educational models: Professional Learning Communities and Response to Intervention. Many schools are in the process of developing Professional Learning Communities (DuFour, 2004). In a Professional Learning Community (PLC), teachers take collective responsibility for the learning of all students at their school. To meet that end, they collaboratively examine evidence of student learning, such as test scores and
student classroom work. Teachers work together to refine their teaching practices, which leads to increased opportunities for student learning.

Similarly, the Response to Intervention model (Fuchs & Fuchs, 2001) focuses on using data to make instructional decisions. Response to Intervention (RTI) became well-known when the 2004 revised Individuals with Disabilities Education Act encouraged earlier intervention for struggling students. With the RTI model, students participate in instructional interventions around needed skills and strategies, and, struggling readers frequently engage in a variety of reading assessments. The data generated from these assessments allow instruction to be tailored to students’ needs.

When using the LinC Cycle, teachers and other school personnel work together to collect and compile data on student literacy. This data becomes the springboard for teaching aimed at developing students’ literacy skills and strategies in the context of content area instruction. Too often, because of multiple demands on teachers’ time, useful data sits untouched in a computer database or a three-ring binder. Chapters six through nine of this book give teachers guidance on how to effectively use this valuable information, along with their professional knowledge, to foster student learning.

**Reflect**

Each day, teachers make decisions based on their professional knowledge and the information in the environment (Colton & Sparks-Langer, 1993). To reflect, teachers give careful attention to their experiences and the instructional choices they make. Reflective teachers observe, analyze, hypothesize, and test those hypotheses. According to John Dewey, this reflective thought is the only thinking that is truly educative (Dewey, 1933). Reflection about teaching leads to growth for teachers and students.

The LinC Cycle provides opportunities for teachers to reflect on their professional knowledge and their students’ needs. Teachers use evidence to draw conclusions about students’ needs
and make decisions about future instruction. Ideally, the reflective process is collaborative; it includes individuals who have an investment in the success of the learner.

The focus on reflection aligns well with the philosophies of schools that are committed to the success of all students. In schools that are or aspire to be Professional Learning Communities, reflection is an essential step between gathering evidence of student learning and teaching the next lesson (DuFour, 2004). When engaged in the LinC Cycle, teachers are reflective decision makers who use many sources of data to improve student learning.

**Plan**

In the LinC Cycle, planning takes on a pivotal role in connecting knowledge about students with teaching practice. When planning for instruction, teachers systematically make decisions about what students should learn and the methods to use for instruction and assessment. The relationship between the teacher and the instructional materials is a dynamic one. Rather than delivering curriculum, teachers work with resources to construct plans that guide instruction (Remillard, 2005). Teachers use their expertise in the content area to understand the standards and evaluate the material provided in the textbook. Once they draw conclusions about class needs, the standards, and the text, teachers begin to select instructional strategies that impart disciplinary literacy of content knowledge and provide for literacy skill development. Using their knowledge of individual students and the class as a whole, teachers develop a LinC Teaching Plan for a lesson that teaches reading while focusing on important subject matter. The plan includes instructional strategies to support the development of vocabulary, fluency, comprehension, and motivation. The LinC Teaching Plan is not an intervention for a select group of students. Rather, it is a plan that accounts for the needs of the individual and the needs of the group.

One unique element of the LinC Cycle is the role of instructional strategies. The use of instructional strategies to support literacy is intentional and based upon student needs. Teachers often have an instructional tool bag filled with instructional strategies. Many teachers, especially new ones, have difficulty deciding when to use a particular strategy. The planning stage of the LinC Cycle gives teachers guidance in choosing strategies to support student vocabulary, fluency, comprehension, and motivation.

Ideally, planning with the LinC Cycle is done collaboratively among teachers at the same school site. For example, in one middle school, teams of teachers meet regularly to discuss student literacy data and plan instruction. These meetings include teachers who all teach the same grade level, even though their subject areas differ. Collaborative planning, when possible, provides opportunities for teachers to share promising teaching practices and to keep each other informed of student progress.

**Teach and Reteach**

After planning, teachers move on to the next stage of the LinC Cycle, teaching and reteaching. The act of teaching is complex and can be defined in different ways. In the LinC Cycle, teaching is a process in which the teacher, a reflective decision maker (Colton & Sparks-Langer, 1993), implements instruction aimed at positively impacting change in students. Teachers use the LinC Teaching Plan to ensure that the instructional strategies they use are carefully chosen. After teaching, they evaluate student learning and make decisions about future instruction. When reteaching, a teacher implements instruction in a different way to lead to positive learning outcomes.

When using the LinC Cycle, teachers use instructional strategies to guide students in their development of reading strategies. Instructional strategies are teaching methods chosen to reach a particular learning outcome. Reading strategies are deliberate actions that readers make in an effort to construct meaning from text (Afflerbach et al., 2008).

The LinC Cycle supports two important principles of reading instruction. First, students most effectively learn to use reading strategies when these strategies are taught explicitly rather
Explicit strategy instruction gives students the tools to succeed with demanding texts (Pressley, 2006). If a strategy is taught explicitly, the teacher shows students how and when to use that strategy as a tool to help their comprehension.

Second, when teaching students a new strategy, effective teachers scaffold student learning. In scaffolded instruction, teachers first demonstrate the strategy, and then they gradually release responsibility for using the strategy to the student. The term scaffolding (Wood, Bruner, & Ross, 1976) describes learning situations that are “socially mediated,” with one person carefully supporting another with new learning (Vygotsky, 1978). Scaffolded instruction includes:

1. **Modeled Practice.** During modeled practice, a teacher demonstrates a procedure. For example, a teacher thinks aloud while modeling how to use a reading strategy. This process allows students to observe the strategy used by a proficient reader.

2. **Guided Practice.** During guided practice, a student repeats the modeled procedure with teacher support. The teacher assists students as they practice the strategy, gradually giving them control over the use of the strategy.

3. **Independent Practice.** During independent practice, a student repeats the procedure without direct teacher intervention. Teachers work toward having students use the strategy individually, but they are still present for guidance and support (Pearson & Gallagher, 1983).

Independent use of strategies requires a heavy mental load, especially when using a new reading strategy to learn difficult content. By gradually releasing responsibility, the teacher ensures that students have mastered the strategy before they use it independently.

Once the lesson sequence is complete, the teacher assesses student progress and plans future instruction. A hallmark of the LinC Cycle is its continuity. During and after instruction, teachers assess students’ progress and use that information to design future instruction. Observational, informal, and formative data is valuable to help make these decisions. The LinC Cycle begins, once again, and the teacher engages in assessment, reflection, planning, and teaching. Data provided from ongoing, informal reading assessments shapes instruction to meet the needs of all students.

The teaching cycle described here greatly simplifies the process of targeted, embedded literacy instruction. In addition, it leads to positive learning outcomes. Over a two-year period, a team of sixth grade teachers used the LinC Cycle to improve student performance with expository text. In the two years prior to the study, students had moved into and through sixth grade with very little growth in their proficiency with content reading material. During the two-year pilot, teachers began using assessment data to plan targeted reading instruction for their students. In both years, mean scores for students rose from 62 to 70 percent proficient in 2007/08 and from 56 to 63 percent proficient in 2008/09. More studies are underway to measure both the qualitative and quantitative effects of the LinC Cycle on student learning.

A study of a similar teaching/learning cycle in another context also had positive effects on learning. Teachers learned to use the cycle to reflect on student outcomes and make instructional decisions. The focus was on reading and writing with 120 students, kindergarten through seventh grade. Results showed that student learning was accelerated; over 12 weeks, the average gain on multiple measures of reading performance was half of an academic year (Jinkins, 2001).

Matching resources and approaches to students’ needs leads to intentional decisions and a greater impact on student learning.
Chapter Summary

The statistics on adolescent literacy are troubling. Many adolescents are not prepared to face the progressively demanding literacy tasks of high school, college, and beyond. By using the LinC Cycle, teachers can embed literacy in context, helping students reach disciplinary literacy by developing their vocabulary, fluency, comprehension, and motivation. Teachers who use the LinC Cycle engage in a continuous cycle of assessment, reflection, planning, teaching, and reteaching to help foster literacy for all.

Resources


Heller, R., & Greenleaf, C. L. (2007). Literacy instruction in the content areas: Getting to the core of middle and high school improvement. Washington, DC: Alliance for Excellent Education.


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Center for Educational Statistics, Institute of Education Sciences, U.S. Department of Education.


