From No Child Left Behind to
Every Child A Graduate

Literacy Instruction in the Content Areas

Getting to the Core of Middle and High School Improvement

ALLIANCE FOR
EXCELLENT EDUCATION

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About the Alliance for Excellent Education

Based in Washington, D.C., the Alliance for Excellent Education is a national policy and advocacy organization that works to help make every child a high school graduate, prepared for college, work, and citizenship. It focuses on the needs of the 6 million secondary school students (those in the lowest achievement quartile) who are most likely to leave school without a diploma or to graduate unprepared for a productive future.

The Alliance's audience includes parents; educators; federal, state, and local policymakers; education organizations; business leaders; the media; and a concerned public. To inform the national debate about education policies and options, the Alliance produces reports and other materials, makes presentations at meetings and conferences, briefs policymakers and the press, and provides timely information to a wide audience via its biweekly newsletter and regularly updated website, www.all4ed.org.

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EXECUTIVE SUMMARY

Over the last several years, a strong coalition of educators, researchers, policymakers, professional associations, and advocacy groups has worked to focus the attention of policymakers and the public on the plight of millions of America's students in grades four through twelve who are unable to read and write well enough to achieve even basic academic success. Already, the efforts of those organizations and individuals have resulted in a wide range of local, state, and federal initiatives designed to help struggling students develop the reading fluency, vocabulary, and comprehension skills they need to move beyond the basic mechanics of literacy and move ahead in the secondary school curriculum.

But if students are to be truly prepared for college, work, and citizenship, they cannot settle for a modest level of proficiency in reading and writing. Rather, they will need to develop the advanced literacy skills that are required in order to master the academic content areas—particularly the areas of math, science, English, and history.

Inasmuch as the academic content areas comprise the heart of the secondary school curriculum, content area literacy instruction must be a cornerstone of any movement to build the high-quality secondary schools that young people deserve and on which the nation's social and economic health will depend.

In order to integrate reading and writing instruction successfully into the academic disciplines, district, state, and federal policymakers must ensure that

1) They define the roles and responsibilities of content area teachers clearly and consistently, stating explicitly that it is not those teachers' job to provide basic reading instruction.
2) Members of every academic discipline define the literacy skills that are essential to their content area and which they *should* be responsible for teaching.
3) All secondary school teachers receive initial and ongoing professional development in teaching the reading and writing skills that are essential to their own content areas.
4) School and district rules and regulations, education funding mechanisms, and state standards and accountability systems combine to give content area teachers positive incentives and appropriate tools with which to provide reading and writing instruction.

For policymakers, the challenge is no longer just to call attention to the nation's adolescent literacy crisis. Nor is it just to secure new resources to help middle and high school students catch up in reading, although the need for those resources remains critical. The challenge is also to connect the teaching of reading and writing to the rest of the secondary school improvement agenda, treating literacy instruction as a key part of the broader effort to ensure that all students develop the knowledge and skills they need to succeed in life after high school.

If students are to be truly prepared for college, work, and citizenship, they cannot settle for a modest level of proficiency in reading and writing.

Content area literacy instruction must be a cornerstone of any movement to build high-quality secondary schools.

ADOLESCENT LITERACY REFORM: EXPANDING THE AGENDA

Literacy instruction is often said to be the cornerstone of the elementary school curriculum. For young children, few things could be more important than to develop the reading and writing skills they will need in order to succeed in later years of school and, eventually, at college and work and in other parts of adult life. Much as every house requires a strong foundation, all students should be grounded firmly in the fundamentals of literacy.

In recent decades, that logic has led policymakers across the country to make larger and larger investments in early reading instruction, with funds going to everything from university-based research studies to local curriculum development projects to statewide reform initiatives to the billion-dollar-per-year federal Reading First program, enacted by Congress in 2002.

These kinds of efforts and investments must continue; young children do need a strong foundation in the mechanics of literacy—but that's not all they need. A foundation doesn't make a house, and basic skills don't make for high-level competence. Without ongoing literacy instruction, students who are behind in reading when they enter the middle grades likely will never catch up. And those who do read and write at grade level can easily become fourteen- or eighteen-year-olds who struggle to understand their textbooks and other academic materials.

Without ongoing literacy instruction, students who are behind in reading when they enter the middle grades likely will never catch up.

According to data from the National Assessment of Educational Progress (NAEP, also known as the Nation's Report Card), the reading skills of America's fourth graders have increased significantly in recent years, with the strongest gains made by low-income and minority students. That progress, many believe, is a direct result of the considerable resources and attention devoted to early literacy instruction.

However, at the secondary level, where there has been relatively little investment, scores have remained flat since the 1970s, when NAEP was created. Today, more than two thirds of all eighth and twelfth graders read at less than a proficient level, and half of those students are so far behind that they drop off the scale entirely, scoring below what the U.S. Department of Education defines as its most basic level. Moreover, in the upper grades, achievement gaps have shown no

signs of narrowing. In 2005, 12 percent of black and 15 percent of Hispanic eighth graders read at or above a proficient level, compared to 39 percent of white eighth graders (Perie et al., 2005). In a typical high-poverty urban school, approximately half of incoming ninth-grade students read at a sixth- or seventh-grade level or below (Balfanz et al., 2002).

This report addresses one important way in which schools can and must improve the literacy instruction they provide to students in grades 4–12. More specifically, it focuses on reading and writing instruction in the academic content areas—particularly the areas of math, science, English, and history—that comprise the heart of the secondary school curriculum.

At the same time, this report is meant to extend the discussion begun in a number of recent high-profile publications that have focused national attention on the topic of adolescent literacy, synthesized and expanded the existing knowledge base in this area, and recommended a variety of ways in which educators and policymakers can support better literacy instruction in middle and high schools.

Across the country, many efforts are beginning or are already underway to translate these reports and recommendations into practice. These include countless small-scale reforms now in progress in schools and districts, statewide programs such as *Just Read, Florida!* and the *Alabama Reading Initiative*, and a number of other state initiatives currently being designed and implemented with the support of the National Governors Association, the National Association of State Boards of Education, and other organizations. Additionally, the federal

In a typical high-poverty urban school, approximately half of incoming ninth-grade students read at a sixth- or seventh-grade level or below.

A Growing Chorus: Recent reports on adolescent literacy

ACT. (2005). *Crisis at the core: Preparing all students for college and work.*

ACT. (2006). *Reading between the lines: What the ACT reveals about college readiness in reading.*

Alliance for Excellent Education. (2003). *Adolescents and literacy: Reading for the 21st century.*

Alliance for Excellent Education. (2004). *Reading next: A vision for action and research in middle and high school literacy.*

Alliance for Excellent Education. (2007). *Writing next: Effective strategies to improve writing of adolescents in middle and high schools.*

Alliance for Excellent Education. (2007). *Double the work: Challenges and solutions to acquiring language and academic literacy for adolescent English language learners.*

American Institutes for Research. (2006). *Lessons and recommendations from the Alabama Reading Initiative: Sustaining focus on secondary reading.*

International Reading Association. (2006). *Standards for middle and high school literacy coaches.*

National Association of Secondary School Principals. (2005). *Creating a culture of literacy: A guide for middle and high school principals.*

National Association of State Boards of Education. (2005). *Reading at risk: The state response to the crisis in adolescent literacy.*

National Council of Teachers of English. (2006). *NCTE principles of adolescent literacy reform: A policy research brief.*

National Governors Association. (2005). *Reading to achieve: A governor's guide to adolescent literacy.*

National School Boards Association. (2006). *The next chapter: A school board guide to improving adolescent literacy.*

Torgesen, J. K., et al. (2007). *Academic literacy instruction for adolescents: A guidance document from the Center on Instruction.*

Even college-bound students often struggle with more advanced literacy skills.

Striving Readers initiative, created in 2004, awarded its first round of grants in 2006, funding eight multischool sites to implement and conduct rigorous scientific studies of the effectiveness of specific interventions designed to help "struggling readers" (a term commonly used to denote middle and high school students who read two or more years behind grade level), and in early 2007, bills were introduced in the U.S. House and Senate to write Striving Readers into law and greatly increase its funding.

The overarching goal of these various reports and initiatives has been to provide more effective literacy instruction to the roughly 8 million American students in grades 4–12 who read far below grade level. By and large, those students have basic literacy skills—that is, most can decode and comprehend simple texts (Kamil, 2003)—but they tend to struggle with the more challenging materials typically assigned in middle and high school, such as textbooks and other informational documents, and have trouble writing clear, effective materials of their own. Even college-bound students often struggle with more advanced literacy skills. For instance, a major study of high school juniors and seniors taking the ACT college entrance exam found that only half were ready for college-level reading assignments in core subjects like math, history, science, and English (ACT, 2005).

Rejecting the common assumption that secondary school is too late to help struggling readers, researchers and advocates point to a number of things schools can do to help students of all ages make significant gains in literacy and perhaps even catch up to their higher-performing peers. Schools can make a point of assessing students' reading skills when they enter school, in order to identify those who read below grade level and discern their specific learning needs. They can provide intensive support for low-level readers, helping them make rapid progress in reading fluency, basic comprehension, and other skills. They can make special efforts to motivate those students (many of whom have been demoralized by years of academic failure) and engage them in reading and writing assignments that tap into their individual interests. And they can offer teachers high-quality professional development in various aspects of secondary literacy instruction.

If state and federal policymakers follow through on current efforts to fund and support these strategies, the effects will be profound, giving millions of youngsters a real opportunity to build on the rudimentary mechanics of reading that they were taught in primary school.

But while these strategies offer much-needed support for adolescents who read in a halting fashion, or who are unfamiliar with academic vocabulary, or who have trouble comprehending academic texts, they remain incomplete. While they will enable students to reach a modest level of proficiency in reading and writing, they do not address the achievement of the higher literacy levels students will need in order to succeed in college, a technical program, or another course of study. To use an analogy: these strategies will help students climb from the lower rungs of the ladder to the middle, but will leave them a few rungs short of being able to continue their education.

The Nation Must Reach for High-Level Literacy Skills

Today, very few of the nation's students—including many who test at grade level—develop the sorts of sophisticated literacy skills that a high school diploma ought to signify, such as the capacity to draw inferences from academic texts, synthesize information from various sources, and follow complicated directions. For example, the most recent NAEP results show that while roughly a third of the country's students are proficient in reading, only 3 percent of eighth graders and 5 percent of twelfth graders read at an advanced level (Perie et al., 2005; Grigg et al., 2007).

Yet mastery of high-level literacy skills can and should be the nonnegotiable goal of public education in a nation that expects its citizens not merely to understand simple messages and write simple paragraphs but also carry out the many responsibilities of everyday life in an open and increasingly diverse society.

The stronger their literacy skills, the more likely adults are to hold a full-time job, vote in national elections, participate in community organizations, volunteer in their neighborhoods, and spend time helping their children with their homework (Kutner et al., 2007). And at a time when many of the fastest-growing occupations demand high-level literacy skills, developing advanced intellectual capacities has become an economic imperative. Today, the ability to read and write and think critically is becoming a minimum requirement even for entry-level jobs in sectors ranging from business to manufacturing to the professional trades (Barton, 2003). For greater and greater numbers of American workers, daily life requires not only the basics of reading and the ability to comprehend and produce simple, straightforward documents but also the kinds of deeper knowledge, creativity, and flexibility that relatively few employees were expected to possess in previous generations (Kirsch et al., 2007; Myers, 1998).

Moreover, many economists warn that with businesses and industries continuing to expand into global markets, the nation as a whole cannot afford to lag behind in educational achievement. According to the National Center for Education and the Economy, "This is a world in which a very high level of preparation in reading, writing, speaking, mathematics, science, literature, history, and the arts will be an indispensable foundation for everything that comes after for most members of the workforce. It is a world in which ... high levels of education—a very different kind of education than most of us have had—are going to be the only security there is" (NCEE, 2006). Unfortunately, according to the Organisation for Economic Co-operation and Development's (OECD) Programme of International Student Assessment in Reading, U.S. fifteen-year-olds ranked a dismal fifteenth, behind every other English-speaking, highly industrialized country participating in the assessment (Canada, Australia, Ireland, United Kingdom, and New Zealand), and behind Japan and Korea as well. In addition, U.S. fifteen-year-olds fell well below the OECD average in engagement in reading and school (OECD, 2003).

If all of America's adolescents are to have a meaningful opportunity to master more sophisticated skills, the movement to improve adolescent literacy instruction must go beyond its current emphasis on helping struggling readers to catch

The stronger their literacy skills, the more likely adults are to hold a full-time job, vote in national elections, participate in community organizations, volunteer in their neighborhoods, and spend time helping their children with their homework.

up in reading fluency, vocabulary, and comprehension. Specifically, policymakers must support effective strategies for helping all students become fully competent in the more advanced kinds of skills needed to succeed in first-year college courses or technical studies and participate fully in civic life.

For policymakers, the challenge is no longer just to call attention to the nation's adolescent literacy crisis. Nor is it just to secure new resources to help middle and high school students catch up in reading, although the need for those resources remains critical. The challenge is also to build on the current interest in and support for secondary reading and writing instruction, treating it as the foundation for more ambitious efforts to improve middle and high school education in its entirety.

Policymakers must recognize that reading and writing are more than just basic skills that permit students to go on and study advanced subject matter; reading and writing are also the very stuff from which the academic content areas are made. Unless students continue to develop their literacy skills *throughout* the K–12 curriculum, and unless they learn to read and write in the sophisticated ways that disciplinary studies demand, they will make no real progress in those subjects.

Literacy stands at the heart of the academic content areas, and inasmuch as these content areas comprise the heart of the secondary school curriculum, content area literacy instruction must be viewed as the cornerstone of any comprehensive movement to build the kinds of thriving, intellectually vibrant secondary schools that young people deserve and on which the nation's social and economic health will depend.

RETHINKING THE ROLE OF LITERACY IN THE CONTENT AREAS

There's much more to reading than the basics, and that becomes especially clear as soon as students start to study the academic content areas. After the elementary years, not only do reading assignments become longer and more full of content; they also become increasingly *varied* in their style, vocabulary, text structure, purpose, and intended audience. For instance, science textbooks differ from textbooks in history and math, and all textbooks differ from the whole universe of other materials that teachers might assign, from newspaper columns to historical documents, reference materials, Internet-based hypertexts, and on and on.

Middle and high school students must learn that in some classes they are expected to follow written instructions to the letter, while in others they are expected to read skeptically, or to question the author's assumptions, or to analyze the writer's style. Moving from one subject area to the next, they must tap into entirely different sets of vocabulary and background knowledge. They must learn to write well in many genres, as well as realize that chemists, historians, mathematicians, journalists, and members of every other profession have their own unique ways of sharing information, getting people's attention, debating, responding to criticism, reporting facts, and establishing authority.

It has become common among literacy researchers to describe the distinct ways of reading and writing and communicating among different groups as "social practices" (Barton, 1994, 2003; Greenleaf, 1994; New London Group, 1996; Scribner and Cole, 1981; Street, 1995). That is, researchers have challenged the assumption that literacy learning is basically a solitary activity. Rather, people learn by interacting with others (especially with people who are more knowledgeable in the area than they are), gradually becoming familiar with and internalizing their ways of doing things (their "practices"). Every academic discipline, or content area, has its own set of characteristic literacy practices. Students won't learn how to read and write and become comfortable in the field of biology, for example, unless they spend a lot of time reading, writing, and talking about biology, ideally with interested peers and well-trained teachers.

To enter any academic discipline is to

Every academic discipline has its own set of characteristic literacy practices.

Imagine having to speak Italian, Arabic, and Russian in the morning, followed by French, Swahili, and Spanish in the afternoon.

For students, that's how it can feel to move from math to English to history to art to science to social studies to driver's education, changing subjects all day long. Every academic content area—and every non-academic kind of text, as well—has its own vocabulary, textual formats, stylistic conventions, and ways of understanding, analyzing, interpreting, and responding to words on the page.

On the following pages is just a sampling of the many kinds of texts a student might be asked to read over the course of a typical school day.

become comfortable with its ways of looking at and communicating about the world. Algebra, for instance, focuses on interactions among real or imagined objects, and it translates those interactions into a simple shorthand language that permits description of how any given "A" relates to a "B" or a "C." By contrast, historians choose to zero in on events rich in *human* significance, and instead of condensing those events into a formal shorthand, they prefer to elaborate on them by means of description, narrative, and logical exposition, so as to flesh out an overarching thesis. Chemists, on the other hand, tend to prize an extremely precise sort of description and narrative, meant not to elaborate a thesis but to compose an accurate record of a procedure and its results. In each case, writers choose particular sorts of words, arrange them in particular sorts of ways, imagine a particular sort of audience, and otherwise bend their language to suit the particular purposes and values of the discipline.

Over the last few decades, education researchers have become increasingly aware of the varied ways in which people use written materials to communicate with one another, define themselves as individuals, and identify themselves as belonging to particular groups, both in and outside of the classroom. Gradually, it has become clear that being "literate" means very different things in differing contexts and content areas (Barton et al., 2002; Borasi and Seigel, 2000; Saul, 2004; Wineburg, 2001).

Yet educators often take a somewhat narrower view of what it means to be literate. Over the last few decades, appeals to teach "reading across the content areas" have tended to translate into courses, textbooks, and workshops that encourage all content area teachers to help their students learn a core set of reading comprehension strategies, and "writing across the curriculum" has tended to mean instruction in a single, all-purpose writing process. Less common have been efforts to help teachers address the literacy demands that are *specific* to their content areas.

Research suggests that the teaching of generic reading comprehension strategies does have merit, and that students can learn a number of routines that can help them comprehend many different kinds of written documents (reviewed in Kamil, 2003; Biancarosa and Snow, 2004; RAND Reading Study Group, 2002; Brown, Palincsar, and Armbruster, 1994). These include *pre-reading* activities such as reviewing vocabulary to be found in the text, making predictions as to what the text is likely to say, and identifying text features such as tables of contents, headings, illustrations, and authors' biographical statements. These strategies also include things that students can do *while reading*, such as drawing a visual representation of the unfolding argument, or asking questions about main ideas as they unfold, or making note of unfamiliar words, concepts, or ideas to research after reading. And they include *post-reading* activities such as summarizing and restating the text's main points, or comparing notes with other students.

Moreover, numerous studies over the past few decades have demonstrated that it is most helpful to teach comprehension strategies, text structures, and word-level strategies *while students are engaged in reading challenging, content-rich texts*. Such skills don't stick when practiced for their own sake. Rather, students learn those

What students might read in high school math.

19. ★ **MULTIPLE CHOICE** What is a completely simplified expression for $\sqrt{108}$?

Ⓐ $2\sqrt{27}$ Ⓑ $3\sqrt{12}$ Ⓒ $6\sqrt{3}$ Ⓓ $10\sqrt{8}$

ERROR ANALYSIS ***Describe*** **and correct the error in simplifying the expression or solving the equation.**

20.

$\sqrt{96} = \sqrt{4} \cdot \sqrt{24}$

$= 2\sqrt{24}$

21.

$5x^2 = 405$

$x^2 = 81$

$x = 9$

EXAMPLES 3 and 4 on pp. 267–268 for Exs. 21–34

SOLVING QUADRATIC EQUATIONS **Solve the equation.**

22. $s^2 = 169$ **23.** $a^2 = 50$ **24.** $x^2 = 84$

25. $6z^2 = 150$ **26.** $4p^2 = 448$ **27.** $-3w^2 = -213$

28. $7r^2 - 10 = 25$ **29.** $\frac{x^2}{25} - 6 = -2$ **30.** $\frac{t^2}{20} + 8 = 15$

31. $4(x - 1)^2 = 8$ **32.** $7(x - 4)^2 - 18 = 10$ **33.** $2(x + 2)^2 - 5 = 8$

34. ★ **MULTIPLE CHOICE** What are the solutions of $3(x + 2)^2 + 4 = 13$?

Ⓐ $-5, 1$ Ⓑ $-1, 5$ Ⓒ $-2 \pm \sqrt{3}$ Ⓓ $2 \pm \sqrt{3}$

35. ★ **SHORT RESPONSE** *Describe* two different methods for solving the equation $x^2 - 4 = 0$. Include the steps for each method.

36. ★ **OPEN-ENDED MATH** Write an equation of the form $x^2 = s$ that has **(a)** two real solutions, **(b)** exactly one real solution, and **(c)** no real solutions.

37. **CHALLENGE** Solve the equation $a(x + b)^2 = c$ in terms of a, b, and c.

PROBLEM SOLVING

EXAMPLE 5 on p. 269 for Exs. 38–39

38. **CLIFF DIVING** A cliff diver dives off a cliff 40 feet above water. Write an equation giving the diver's height h (in feet) above the water after t seconds. How long is the diver in the air?

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39. **ASTRONOMY** On any planet, the height h (in feet) of a falling object t seconds after it is dropped can be modeled by $h = -\frac{g}{2}t^2 + h_0$ where h_0 is the object's initial height (in feet) and g is the acceleration (in feet per second squared) due to the planet's gravity. For each planet in the table, find the time it takes for a rock dropped from a height of 150 feet to hit the surface.

Planet	Earth	Mars	Jupiter	Saturn	Pluto
g (ft/sec^2)	32	12	76	30	2

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○ = WORKED-OUT SOLUTIONS on p. WS1 ★ = STANDARDIZED TEST PRACTICE

Larson, R., et al. (2007) McDougal Littell Algebra 2 (pupil's edition). Boston, MA: McDougal Littell/Houghton Mifflin.

skills best when they have compelling reasons—such as the desire to make sense of interesting materials—to use them (Alvermann, 2002; Guthrie and Wigfield, 1997; Vacca and Vacca, 1998; Wilhelm and Smith, 2002).

Given that content area reading materials are often quite difficult—in fact, many of the most popular middle and high school textbooks rival the complexity of college-level materials in their syntax, vocabulary, content, and presentation—it makes good sense to encourage all teachers to become familiar with these strategies. Students will need advanced literacy skills in order to do the sorts of intellectual work that the academic disciplines require, such as conducting and reporting scientific experiments, analyzing historical sources, or proving mathematical theorems. If teachers want their students to be able to handle such assignments, they would do well to help them become more competent in reading difficult texts in general.

However, a sole emphasis on generic reading comprehension strategies may also lead students to believe that all academic texts are more or less the same, as though the reading that students do in math class were identical to the reading they do in history, or as though good writing in biology were identical to good writing in English.

Not all literacy skills can be transferred easily from one field to another (Alvermann and Moore, 1991; Hynd, 1998; Bazerman and Russell, 2003; Moje, 2006). The ways in which successful students read algebra textbooks (for example, working to translate word problems into an understanding of the problem being posed and a representation of the problem in algebraic terms, then working to arrive at a single, correct mathematical solution) don't apply to reading and interpreting modern poetry (which calls for sustained attention to word choice, tone, the relationship of form to content, narrative voice, the use of metaphor and symbol, and other aspects of language that don't often come into play when studying algebra). And the ways in which students write up their chemistry notes (crafting a detailed, impersonal, accurate record of steps taken and reactions observed) may not be helpful when trying to write a history paper or a literary analysis.

To become competent in a number of academic content areas requires more than just applying the same old skills and comprehension strategies to new kinds of texts. It also requires skills and knowledge and reasoning processes that are specific to particular disciplines. By way of illustration, consider two of the core subject areas, science and history. To some extent, the challenges involved in reading the texts of these disciplines are the same. For example, whether students have to read a chemistry paper or a political speech from the Civil War, they will probably need to learn new terms and phrases, pay close attention to detail, and work their way through long, complex sentences, written in a style that sounds nothing like contemporary spoken English. Likewise, when assigned to write a term paper on either of these subjects, they will probably want to generate ideas and organize what they intend to write, write more than one draft, and cite prior sources and include them in a bibliography.

In many other ways, though, science texts are very different from texts in

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

history, and each discipline emphasizes particular kinds of language and particular approaches to reading and writing. In chemistry textbooks, for example, language tends to be extremely precise with respect to things and events in the physical world, and students must learn to read those parts of the text with exactitude, taking care to note whether a reaction occurred at 31.9 degrees Fahrenheit or 32.1 degrees Fahrenheit, or whether a solution turned orange or yellow. However, students likely will have no reason to ask whether a particular experiment was conducted in New Hampshire or Georgia, or whether it happened to occur in 2001 or 2003.

At times, historians may pay close attention to these sorts of physical details, too, but their reasons for doing so are different from those that motivate chemists (Wineburg, 2001; Wilson and Wineburg, 1988). In particular, historians tend to be more exacting readers than chemists when it comes to details that made an important difference in people's lives, and they tend to take a special interest in the *circumstances* in which written documents were produced, particularly when reading primary source materials. Here, the context in which materials were written matters as much as the literal meaning of the text itself, and students need to know that it is crucial to take note of who wrote the given document, under what circumstances, for whose eyes and ears, and to what ends. To fully comprehend the significance of a Civil War–era speech, for example, students must understand that it matters greatly whether it was composed in 1860 or 1862, or whether it was delivered by a senator from New Hampshire or one from Georgia.

All teachers, in every discipline, have reasons to emphasize certain kinds of reading and writing over others, depending on the nature of the specific content and skills they want their students to learn. Some kinds of details matter more when reading in history class than in chemistry, or in biology class more than in algebra. Certain forms of writing (interpretive essays, for example) tend to be required in American Literature even though they would be considered inappropriate in Earth Science, where an extended scientific explanation of data would be expected.

If the goal of content area instruction were simply to get students to memorize facts and crunch numbers, there would be little reason to show them that they need to pay attention to different things when reading algebra textbooks and geometry textbooks, or that a lab report requires a different narrative voice than a historical essay. However, the goal of content area instruction is instead to introduce students to the ways in which experts in the core academic disciplines look at the world, investigate it, and communicate to one another about what they see and learn.

This is not to say that middle and high school students should be expected to become fully expert in the ways that scientists, historians, and other disciplinary specialists read and write. To produce an expert level of fluency in the literacy of any profession or content area is a goal better left to professional training programs, college majors, and graduate schools.

But as adolescents move up through the middle and high school curriculum, they will have to read and write in increasingly varied ways in various content

All teachers, in every discipline, have reasons to emphasize certain kinds of reading and writing over others, depending on the nature of the specific content and skills they want their students to learn.

areas. And in the best of circumstances—where the secondary school curriculum is properly aligned with authentic disciplinary endeavors and builds the academic dispositions and skills that will be important to postsecondary pursuits—students' reading and writing assignments become increasingly similar to the ones they will encounter at college and in the workforce.

Moreover, even if students still need help developing fluency, increasing their vocabularies, and learning reading comprehension strategies, they must receive content area literacy instruction at the same time. Teachers may be tempted to take them out of the regular curriculum and to drill them in basic literacy skills (or to dumb down their assignments or even to excuse them from coursework altogether). However, abundant evidence shows that students tend to be ill-served by having to do basic, skills-focused reading exercises at the expense of time spent engaged in reading, writing, and talking about academic content. Such empty, remedial exercises tend to be intellectually bland, and they only reinforce certain common misconceptions, such as the notion that skillful reading amounts to nothing more than pronouncing the words on the page (Allington, 2001; Alvermann and Moore, 1991; Carbonaro and Gamoran, 2002; Hull and Rose, 1989; Knapp, 1995).

The role of knowledge and domain-specific vocabulary in reading comprehension is well known (Alexander and Jesson, 2000). If students do not have the opportunity to learn subject area concepts and vocabulary, their word knowledge and capacity to read a broader range of texts will be further diminished. In fact, research sponsored by ETS found that inequalities in students' access to a rigorous academic curriculum contribute significantly to the achievement gaps that separate relatively affluent and/or white students from low-income and minority students (Barton, 2003). Likewise, research from ACT (2006) found that exposure to rigorous, well-written materials in science, history, and other disciplines is the best available predictor of students' ability to succeed in introductory college courses.

If students do not have the opportunity to learn subject area concepts and vocabulary, their word knowledge and capacity to read a broader range of texts will be further diminished.

It is certainly challenging to work with students who need help understanding textbooks, but rather than excusing those students from demanding assignments, teachers would do better to find ways to engage them in reading, writing, and talking about compelling issues and problems related to the particular academic discipline. They can do this by, for instance, providing materials that are related to the subject matter and are written at a level of complexity that the given students can manage; such texts are becoming increasingly available today, now that the major textbook companies have begun to respond to the current attention to adolescent literacy. And instead of focusing only on students' deficiencies in reading and writing, teachers would be well-advised to look for the cognitive, social, and personal strengths students bring with them from home, which can be used to build connections to academic content and interest them in the reading and writing that go on at school (Greenleaf, Brown, and Litman, 2004; Guthrie, 2004; Moje, 2006).

Simply put, teachers should assume that all students are capable of doing rigorous academic work—even if they struggle with fluency, vocabulary,

What students might read in high school English.

Othello

by William Shakespeare

ACT I
SCENE I. Venice. A street.

Enter RODERIGO *and* IAGO

RODERIGO Tush! never tell me; I take it much unkindly
That thou, Iago, who hast had my purse
As if the strings were thine, shouldst know of this.

IAGO 'Sblood, but you will not hear me:
If ever I did dream of such a matter, Abhor me.

RODERIGO Thou told'st me thou didst hold him in thy hate.

IAGO Despise me, if I do not. Three great ones of the city,
In personal suit to make me his lieutenant,
Off-capp'd to him: and, by the faith of man,
I know my price, I am worth no worse a place:
But he; as loving his own pride and purposes,
Evades them, with a bombast circumstance
Horribly stuff'd with epithets of war;
And, in conclusion,
Nonsuits my mediators; for, 'Certes,' says he,
'I have already chose my officer.'
And what was he?
Forsooth, a great arithmetician,
One Michael Cassio, a Florentine,
A fellow almost damn'd in a fair wife;
That never set a squadron in the field,
Nor the division of a battle knows
More than a spinster; unless the bookish theoric,
Wherein the toged consuls can propose
As masterly as he: mere prattle, without practise,
Is all his soldiership. But he, sir, had the election:
And I, of whom his eyes had seen the proof
At Rhodes, at Cyprus and on other grounds
Christian and heathen, must be be-lee'd and calm'd
By debitor and creditor: this counter-caster,
He, in good time, must his lieutenant be,
And I--God bless the mark!--his Moorship's ancient.

RODERIGO By heaven, I rather would have been his hangman.

reading comprehension, or decoding—and they should provide every student with meaningful and interesting opportunities to learn high-level skills by reading, writing, and talking about rich intellectual content.

Teachers need to understand that literacy proficiency grows through developmental processes that continue over a lifetime (Alexander, 2007). In order for students to become proficient in the long term, they must be willing to ride out short-term mistakes, take risks, accept a certain amount of confusion and error, and remain confident that things will in time come to seem easier and more "natural" (Bartholomae, 1985; Lave and Wenger, 1991). Content area teachers must be patient in supporting students as they make their way through a complex reading assignment, learn the vocabulary specific to the content area, or compose a thoughtful and well-constructed essay.

Teachers need to understand that literacy proficiency grows through developmental processes that continue over a lifetime.

RETHINKING TEACHER QUALITY: TAKING CONTENT AREA LITERACY INSTRUCTION INTO ACCOUNT

In the early grades, nobody asks whose job it is to teach literacy skills. Most primary school teachers are generalists, and they must be knowledgeable about literacy instruction, among other subjects.

But at the secondary level, the responsibility for teaching reading and writing often seems to belong to no one in particular. Rather, middle and high school teachers have traditionally been defined as specialists in the academic content areas, where content is understood to be an entirely different matter from skills. Ask math, science, and history teachers where students receive literacy instruction, and they might shrug, or maybe they'll point to the English department. Ask the English teachers, though, and many of them will shake their heads—English teachers tend to regard themselves as content area specialists too, with *literature* as their subject matter, and only partly as reading and writing instructors.

Yet the idea that all middle and high school teachers *should* provide literacy instruction goes back a long way. For the last few decades, most states have required that all candidates for secondary certification complete at least one course in content area reading instruction. And since at least the 1970s, numerous school, district, and national initiatives have been active in promoting reading and writing across the curriculum (Herber, 1970; Bazerman and Russell, 1994), and some of those initiatives remain vibrant today. For example, the National Writing Project, founded in 1974, now provides workshops and summer institutes on writing instruction to roughly 140,000 middle and high school teachers every year, including teachers from all academic content areas. Further, the amount of writing assigned in the nation's secondary schools appears to have increased somewhat over the last few decades, probably due at least in part to these sorts of programs (Hillocks, 2003; Applebee and Langer, 2006). Likewise, new books and articles on content area reading instruction appear every year, and countless workshops and conferences are dedicated to the topic. No doubt, many thousands of teachers have integrated some amount of reading instruction into their content area classes as a result.

Still, however, evidence suggests that relatively little literacy instruction goes on

At the secondary level, the responsibility for teaching reading and writing often seems to belong to no one in particular.

If students need help with decoding, fluency, and the like, then schools and districts need to hire well-trained reading specialists who can provide that help.

in most content area courses. The vast majority of middle and high school students engage in very little sustained reading, and when they do it is mainly from brief, teacher-created handouts and, to a lesser degree, from textbooks. Most secondary school teachers encourage and require very little reading of primary sources or real-world materials. Most devote little if any class time to showing students, explicitly, what it means to be a good reader or writer in the given subject area. And most students engage in very little discussion of what they have read, how to write, or how to interpret, analyze, or otherwise respond to texts (Hull and Rose, 1989; Hillocks, 1986; Cuban, 1989; Connors, 1997; Wade and Moje, 2000; Applebee and Langer, 2006).

Why has content area literacy instruction been slow to take hold?

To some extent, the message to content area teachers from researchers and school officials has been unclear and perhaps muddied further by pre-conceptions educators may hold about literacy. Generations of researchers and educators have drawn a sharp distinction between the teaching of basic skills and the teaching of academic content, with reading and writing assigned to the former. Indeed, it is sometimes argued that students should master the basics of literacy by the fourth grade *so that* they can go on to study advanced subject matter, such as mathematical theorems, historical events, scientific methods, great works of literature, and so on.

When education reformers call for more literacy instruction in the content areas, they may intend to mean the integration of the two, highlighting the fact that every discipline has its own ways of communicating. However, content area teachers may *hear* something else entirely, namely the suggestion that they shoulder the burden for teaching skills that should have been taught once and for all in the elementary grades. "But I'm not a reading teacher," is the standard reply, spoken with a mixture of puzzlement and defensiveness.

There's a straightforward lesson to be learned here: If education reformers and policymakers hope to persuade greater numbers of teachers to integrate literacy instruction into the content areas, then they must be extremely clear as to *whom* they are asking to take on *which* responsibilities for *which* aspects of literacy instruction. Simply put, they must take special care to reassure middle and high school teachers that they don't intend for them to teach basic reading skills. It's not their job to teach those skills, and if students need help with decoding, fluency, and the like, then schools and districts need to hire well-trained reading specialists who can provide that help.

But if content area literacy instruction has been slow to catch on, it isn't just because advocates haven't explained themselves clearly enough. More important, content area teachers have to contend with a number of pressures that make it difficult to emphasize the teaching of reading and writing even if they fully agree with the need to do so.

For one thing, incorporating literacy instruction into the content areas can be extremely time-consuming. When teachers assign complex reading and writing projects, they guarantee themselves many long hours showing students how to make sense of their books, develop their arguments, and draft and revise their essays. Throw in a

What students might read in high school science.

On the actual Chemistry Test, the following type of question must be answered on a special section (labeled "Chemistry") at the lower left-hand corner of your answer sheet. These questions will be numbered beginning with 101 and must be answered according to the following directions.

Sample Answer Grid

*Fill in circle CE (correct explanation) only if statement II is a correct explanation of the true statement I.

	I		II		CE*
101	Ⓣ	Ⓕ	Ⓣ	Ⓕ	◯

Directions: Each question below consists of two statements, I in the left-hand column and II in the right-hand column. For each question, determine whether statement I is true or false and whether statement II is true or false and fill in the corresponding T or F circles on your answer sheet. *Fill in circle CE only if statement II is a correct explanation of the true statement I.

I		II
101. The rate at which sugar dissolves in water increases with stirring	BECAUSE	stirring exposes the surface of a solute crystal to a less concentrated layer of solution.
102. Diamond has a high melting point	BECAUSE	in a diamond crystal, the carbon atoms are held in place by ionic bonds.
103. Potassium has a lower first ionization energy than lithium has	BECAUSE	potassium has more protons in its nucleus than lithium has.
104. Zinc metal will reduce Cu^{2+} in solution	BECAUSE	zinc is a more active metal than copper is.
$HC_2H_3O_2 + H_2O \rightleftarrows C_2H_3O_2^- + H_3O^+$		
105. If some acetic acid, $HC_2H_3O_2$, is added to the equilibrium mixture represented by the equation above, the concentration of H_3O^+ decreases	BECAUSE	the equilibrium constant of a reaction changes as the concentration of the reactants changes.

On the actual Chemistry Test, the remaining questions must be answered by returning to the section of your answer sheet you started for the Chemistry Test.

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case and then fill in the corresponding circle on the answer sheet.

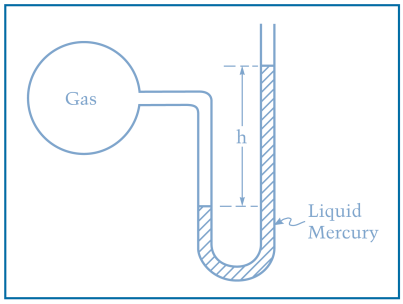
11. The hydrogen ion concentration of a solution prepared by diluting 50. mL of 0.10 *M* $HNO_3(aq)$ with water to 500. mL of solution is

(A) 0.0010 *M* (B) 0.0050 *M* (C) 0.010 *M* (D) 0.050 *M* (E) 1.0 *M*

. . . $Cu^{2+}(aq)$ + . . . $I^-(aq) \rightarrow$ . . . $CuI(s)$ + . . . $I_2(s)$

12. When the equation above is balanced and all coefficients are reduced to lowest whole-number terms, the coefficient for $I^-(aq)$ is

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5



13. The bulb of the open-end manometer shown above contains a gas. True statements about this system include which of the following?

I. Only atmospheric pressure is exerted on the exposed mercury surface in the right side of the tube.
II. The gas pressure is greater than atmospheric pressure.
III. The difference in the height, h, of mercury levels is equal to the pressure of the gas.

(A) II only
(B) III only
(C) I and II only
(D) I and III only
(E) I, II, and III

College Board. (2006). SAT Subject Tests™ preparation, 2006-2007. New York, NY: Author.

number of other factors that complicate teachers' lives—such as content standards that require them to cover vast amounts of material, cutbacks in funding for libraries and books, wide variability in students' reading proficiency, increasing enrollments of non-native English speakers, lack of instructional materials that can support varied students in learning, and chronic problems of student discipline, absenteeism, and school safety—and it's no wonder that some teachers resort to reading the textbook aloud, drilling students in isolated facts, or even showing movies in class, rather than assigning independent reading and writing projects and providing the intensive support students need in order to complete them successfully.

Moreover, no clear message has been sent to middle and high school teachers as to whether they will be held accountable and rewarded for helping students develop advanced, discipline-specific literacy skills. Federal law now requires states to test student reading skills in grades 3–8 and once in high school, but those reading tests are mainly designed to measure basic and intermediate skills, not to assess the sorts of higher-level skills that come into play when students encounter specialized, disciplinary texts. Further, the standards documents adopted by all fifty states are mostly silent on the teaching of reading and writing in content areas other than English/language arts (Lee, 2007; Lee and Spratley, in press; ACT, 2005). And while open-ended writing activities are now included in nearly every state's accountability system, most states' achievement tests place far greater emphasis on multiple-choice and short-answer items than on independent writing, and to the extent that writing is included, students tend to be rewarded for producing quick, superficial essays (Hillocks, 2003; Applebee and Langer, 2006). Thus, some experts worry that existing accountability systems create incentives for teachers to drill students in simple, formulaic kinds of writing, at the expense of time they might otherwise spend teaching them to write thoughtful, independent, and varied kinds of papers in science, history, and other subjects.

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Perhaps the greatest challenge of all has to do with the scarcity of ongoing, high-quality professional development for teachers. In spite of the many workshops and textbooks dedicated to literacy across the curriculum, and in spite of the single pre-service course required in most states, relatively few of the nation's secondary school teachers have had meaningful opportunities to learn about the reading and writing practices that go on in their own content areas.

More optimistically, though, when they do receive intensive and ongoing professional support, many content area teachers find a way to emphasize reading and writing in their classes (Greenleaf and Schoenbach, 2004; Lieberman and Wood, 2002). For all the time and effort such instruction requires, for all the competing incentives state standards and accountability systems may present, and for all the pressures that bear on teachers every day, many teachers do in fact manage to integrate literacy instruction successfully into their content area courses.

Teaching Must be Treated as a Learning Profession

What kind of professional support is needed to help content area teachers integrate reading and writing in their classes? Over the past thirty years, researchers have learned a great deal about the ways in which teachers think and make decisions amid all the dynamic flow of everyday classroom life. To teach effectively involves not just careful planning and preparation, and not just a deep understanding of the given subject matter, but also a myriad of instructional decisions and refinements made on the fly while addressing the varied needs and interests of many students all at once, and while attending to multiple goals, tasks, and classroom materials simultaneously, under constantly changing circumstances (Ball and Cohen, 1999).

In public policy debates about teacher quality—such as ongoing debates about the "highly qualified teacher" provision of the No Child Left Behind Act—expertise tends to be defined much more narrowly than this, however. For example, traditional teacher preparation programs are often criticized for putting too much emphasis on pedagogy (or general teaching skills) and making not enough effort to ensure that aspiring teachers know their subject areas. In response, teacher educators tend to argue that while content area expertise may be important, this expertise doesn't necessarily translate into good teaching; without a solid grounding in principles of effective instruction, it doesn't matter how smart or how knowledgeable teachers may be.

However, it would be productive for policymakers to move beyond this sort of back-and-forth argument as to whether "content knowledge" or "pedagogy" should play the lead role in teacher preparation. Teachers most certainly need to know their content areas, and they most certainly need to have some knowledge of pedagogy in general; but the real, long-term goal of teacher education should be to help teachers integrate the two, developing what has been called "pedagogical content knowledge" (Shulman, 1986), or the specific knowledge and skills required to teach one's *particular* content area effectively.

Much as every academic discipline has its own distinct ways of looking at and communicating about the world, every academic subject area presents students with its own distinct challenges. For example, teachers may notice that certain mathematical theorems, historical concepts, and chemistry experiments always seem to give students trouble. Year after year, literature students may have a particularly hard time grasping the notion of an unreliable narrator, for example, or biology students may have a difficult time distinguishing between bacteria and viruses.

Ideally, teachers learn to recognize such trouble spots, and they come up with explanations or metaphors or demonstrations that help students get the particular concept or learn the particular skill. Over time, the best teachers come up with a wide repertoire of these strategies, and they become adept at recognizing when students are stumped by a given formula or assignment and when a favorite old metaphor or demonstration might come in handy.

How do teachers come to recognize which parts of the curriculum are likely to mystify students, and how do they build a

Much as every academic discipline has its own distinct ways of looking at and communicating about the world, every academic subject area presents students with its own distinct challenges.

School systems should do as much as possible to ensure that teachers have opportunities to talk with colleagues from their own disciplines about the specific problems they face in the classroom and the specific things they do to solve them.

repertoire of effective teaching strategies, designed to help students get through those trouble spots? In some cases, teachers seem to have the capacity, talent, and drive needed to come up with such strategies on their own, through trial and error. Some people just seem to be naturally gifted at drawing analogies between science concepts and everyday life, for example, or relating historical crises to current events. However, if the goal is to significantly increase the numbers of teachers who have this kind of expertise, policymakers should invest in effective professional development on a broad scale, rather than counting on individual teachers to develop these skills on their own.

School systems should do as much as possible to ensure that teachers have opportunities to talk with colleagues from their own disciplines about the specific problems they face in the classroom and the specific things they do to solve them. Moreover, it can be particularly useful for teachers to discuss instruction in the context of *doing* the very same kinds of mathematical procedures, scientific experiments, historical studies, and literary analyses they mean to teach. Not only is it crucial that teachers have opportunities to practice and strengthen their own disciplinary knowledge and skills, but it is in the context of doing actual math problems, writing assignments, and performing other disciplinary work that they are most likely to become aware of the challenges their students face when doing the same tasks.

Nowhere are these kinds of opportunities more crucial than at the intersection of literacy and the content areas. Teachers may be knowledgeable in their own disciplines and skilled at explaining complex formulas and illustrating key points; they may be entirely willing and eager to provide explicit instruction in the specific literacy skills that matter in their content areas. But even so, they may still be unsure of their own capacity to teach reading and writing, and they may not regard their own proficiency as a resource they can draw on in the classroom. It is one thing to know how to read and write with expertise, and it is something else entirely to develop an acute awareness of the ways in which one reads and writes and makes sense of disciplinary texts, so that one can show students how to do so too. In the context of studying their own disciplines, the hidden literacies—ways of reading, writing, talking, and reasoning—that support these tasks can become apparent to teachers, informing their thinking about the role of literacy in the discipline, as well as ways to help students acquire these skills.

Learning to Make the Content Areas Transparent

Students in American schools come from increasingly varied economic, linguistic, cultural, and ethnic backgrounds, bringing with them very different styles of communication. They enter school having different assumptions about how one is supposed to initiate and sustain conversations, talk to teachers, parents, and other kids, and read and write in school (Gee, 1992; Heath, 1983; Cazden, 2001; Wilkenson and Silliman, 2000; Purcell-Gates, 2006).

In an extremely homogeneous society, it might be defensible to assume that all kids have more or less the same beliefs about when it is okay to interrupt, whether it is appropriate for girls to talk

There Is To Be No War

Alfred Iverson of Georgia
Speaking before the U.S. Senate
December 4, 1860

We intend, Mr. President, to go out peaceably if we can, forcibly if we must; but I do not believe, with the Senator from New Hampshire, that there is going to be any war. If five or eight States go out, they will necessarily draw all the other Southern States after them. That is a consequence that nothing can prevent. If five or eight States go out of this Union, I should like to see the man that would propose a declaration of war against them, or attempt to force them into obedience to the Federal Government at the point of the bayonet or the sword.

Sir, there has been a good deal of vaporing on this subject. A great many threats have been thrown out. I have heard them on this floor, and upon the floor of the other House of Congress; but I have also perceived this: they come from those who would be the very last men to attempt to put their threats into execution. Men talk sometimes about their eighteen million who are to whip us; and yet we have heard of cases in which just such men had suffered themselves to be switched in the face, and trembled like sheep-stealing dogs, expecting to be shot every minute.

But, sir, there is to be no war. The Northern States are controlled by sagacious men, like the distinguished Senator from New York [William H. Seward]. Where public opinion and action are thus controlled by men of common sense, who know well that they cannot succeed in a war against the Southern States, no such attempt at coercion will be made. If one State alone was to go out, unsustained by her surrounding sister States, possibly war might ensue, and there might be an attempt made to coerce her, and that would give rise to civil war; but, sir, South Carolina is not to go out alone. In my opinion, she will be sustained by all her Southern sisters. They may not all go out immediately; but they will, in the end, join South Carolina in this important movement; and we shall, in the next twelve months, have a confederacy of the Southern States, and a government inaugurated, and in successful operation, which, in my opinion, will be a government of the greatest prosperity and power that the world has ever seen.

The fifteen slave States, or even the five of them now moving, banded together in one government, and united as they are soon to be, would defy the world in arms, much less the Northern States of this confederacy. Fighting on our own soil, in defence of our own sacred rights and honor, we could not be conquered even by the combined forces of all the other States; and sagacious, sensible men in the Northern States would understand that too well to make the effort.

back to boys, whether it is acceptable for students to question the teacher, whether readers are expected to disagree with published authors, and so on. But in an extraordinarily diverse society like the United States, educators would be better off assuming the opposite. Students arrive at school from all sorts of backgrounds, and many of them are mystified simply by the ways in which their teachers and peers talk to one another in the lunchroom, and even more so by how they read and write in their algebra, English, and civics classes.

For content area teachers, a key challenge is to articulate and make concrete the skills, knowledge, and concepts they may take for granted but that many students need to be shown explicitly.

For content area teachers, then, a key challenge is to articulate and make concrete the skills, knowledge, and concepts they may take for granted but that many students need to be shown explicitly. And here, teachers' own expertise can be both a blessing and a curse. Well-trained biology teachers, for example, know how to distinguish between good laboratory reports and bad ones, and they know technical conventions such as the use of arrows in science illustrations to support their comprehension of visual texts. But they may no longer remember what it was like to learn these things for the first time. The format and style of a laboratory report or the conventions used in science illustrations may be so familiar to them that they begin to take for granted that these things are self-evident to everybody else, too.

To become an expert, whatever the field, is to internalize specific disciplinary standards and to learn how to do certain things more or less automatically. For instance, accomplished tennis players don't stop to think about the proper way to hit backhand shots; they just hit the ball. Accomplished artists don't need to remind themselves about basic composition; they organize and use the available visual space without having to work at it. And accomplished biologists don't ask themselves which style one uses in a laboratory report; they simply sit down at the computer and start writing.

As a matter of basic professional preparation, all teachers should know not only how to integrate comprehension strategies into their ongoing instruction to help students access the academic content, but they should also understand what is distinct about reading and writing in their own discipline, and how to make those rules, conventions, and skills apparent to students. If students are to succeed in the content areas, teachers will need to demystify the reading and writing that go on there, putting those things on the table for everyone to see and discuss. They may need to help their students to see that such disciplinary styles exist, and that each discipline uses vocabulary, text structures, stylistic conventions, and modes of analysis and debate that are very different from the language students hear at home, or among their friends, or elsewhere in school (Delpit, 1995; Gee, 1996; Lee, 1995; Rose, 1989).

If students are to succeed in the content areas, teachers will need to demystify the reading and writing that go on there.

Further, in a diverse society it is not enough for teachers to know *about* particular cultural or linguistic or socioeconomic groups of students. In addition, teachers need to know *how* to tap into the resources different students bring into the classroom (Cazden and Mehan, 1989; Greenleaf, Hull, and Reilly, 1994; Lee, 2005). To help all students succeed with academic tasks, teachers must be able to help students from all backgrounds build from the familiar to the unfamiliar, from the known boundaries of their culturally shaped,

What students in high school might read outside of the classroom.

SECTION 4 – STUDENT FINANCES

- Answer the questions as of the date you will complete and sign your FAFSA.
- This section asks about your income. Refer to your IRS tax return when necessary.
- If you filed a foreign tax return, convert all figures to U.S. dollars, using the exchange rate. To view the daily exchange rates, go to **www.federalreserve.gov/releases/h10/update**.
- If you are married as of today, report your and your spouse's income, even if you were not married in 2006. Ignore references to spouse if you are single, divorced, separated or widowed.

Have you completed a 2006 IRS income tax return or other income tax return? (Q32)

- ❑ Already completed
- ❑ Will file
- ❑ Will not file

What income tax return did you file or will you file for 2006? (Q33)

- ❑ IRS 1040
- ❑ IRS 1040A or 1040EZ
- ❑ A foreign tax return
- ❑ A tax return with Puerto Rico, another U.S. territory or a freely associated state

If you filed or will file a 1040, were you eligible to file a 1040A or 1040EZ? (Q34)

In general, you are eligible to file a 1040A or 1040EZ if you make less than $100,000, do not itemize deductions, do not receive income from your business or farm, and do not receive alimony. A person is not eligible to file a 1040A or 1040EZ if he or she makes $100,000 or more, itemizes deductions, receives income from his or her own business or farm, is self-employed, receives alimony, or is required to file Schedule D for capital gains. If you filed a 1040 only to claim Hope or Lifetime Learning tax credits, and you would otherwise have been eligible for a 1040A or 1040EZ, you should answer "Yes."

- ❑ Yes
- ❑ No
- ❑ Don't know

What was your (and your spouse's) adjusted gross income for 2006? (Q35)

Adjusted gross income is on IRS Form 1040—line 37; 1040A—line 21; or 1040EZ—line 4.

$

What was your (and your spouse's) income tax for 2006? (Q36)

Income tax amount is on IRS Form 1040—line 57; 1040A—line 35; or 1040EZ—line 11.

$

Enter your (and your spouse's) exemptions for 2006. (Q37)

Exemptions are on IRS Form 1040—line 6d or 1040A—line 6d. On the 1040EZ, if a person checked either the "you" or "spouse" box on line 5, use EZ worksheet line F to determine the number of exemptions ($3,300 equals one exemption). If a person didn't check either box on line 5, enter 01 if he or she is single, or 02 if he or she is married.

How much did you (and your spouse) earn from working (wages, salaries, tips, combat pay, etc.) in 2006? (Q38, 39)

Answer this question whether or not you filed a tax return. This information may be on your W-2 forms or on IRS Form 1040—lines 7+12+18+Box 14 of IRS Schedule K-1 (Form 1065); 1040A—line 7; or 1040EZ—line 1.

Student $

Spouse $

- If you answered "YES" to ANY question in Section 2, answer the following questions.
- If you answer "NO" to all the questions in Section 2, skip these questions and go to "Student FAFSA Worksheets A, B and C."

How many people are in your household? (Q90)

Include in your household: (1) yourself (and your spouse, if you are married), (2) your children, if you will provide more than half of their support from July 1, 2007, through June 30, 2008, and (3) other people if they now live with you, you provide more than half of their support, and you will continue to provide more than half of their support from July 1, 2007, through June 30, 2008.

How many people in the question above will be college students in 2007-2008? (Q91)

Always count yourself. Include others only if they will attend college at least half time in 2007-2008 in a program that leads to a college degree or certificate.

In 2006, did you (or your spouse) or anyone in your household (from Q90) receive benefits from any of the federal benefit programs listed? (Q92-96)

Mark all the programs that apply.

The federal benefit programs are listed in the answer column. Report benefits received for all of your household members. Use the instructions in Q90 to identify who is included in your household.

- ❑ Supplemental Security Income
- ❑ Food Stamps
- ❑ Free or Reduced Price School Lunch
- ❑ Temporary Assistance for Needy Families (TANF)
- ❑ Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

United States Department of Education. (2006). Free application for Federal Student Aid. FAFSA on the Web Worksheet for 2006-2007. Retrieved May 7, 2007 from <http://www.fafsa.ed.gov/fafsaws67bw.pdf>

everyday lives to the unknown terrain of broader academic and scientific and civic participation. To do this, teachers will need pre- and in-service programs that make a real effort to help them learn about the ways in which students think about their own educational goals and literacy skills. They will need tools—such as videotapes of students at work, or opportunities to interview students—that allow them to gain insight into the sorts of reading and writing assignments and concepts that give their students trouble. And they will need guidance from teacher educators and professional development staff that can help them translate those insights into more effective instruction.

KEY CONSIDERATIONS FOR EDUCATION LEADERS AND POLICYMAKERS

What can local, state, and federal policymakers do to encourage larger numbers of math, English, history, science, and other content area teachers to integrate literacy instruction more fully into their everyday classroom practice? If they are to make sound policy decisions and design effective programs of school improvement, what considerations must they keep in mind?

1. The roles and responsibilities of content area teachers must be clear and consistent.

Too many of the nation's middle and high school students are unable to decode texts, or they decode with too little accuracy or too slowly to permit them to comprehend the meaning of what they are reading. Those students need intensive, high-quality reading interventions that will allow them to finally master the basic mechanics of reading that should have been mastered in elementary school. Few content area teachers are prepared to offer this sort of instruction, and schools must not assume that they are willing or able to do so.

Content area teachers need to be assured that they will not be held responsible for teaching basic reading skills to middle and high school students. That's a job for reading specialists and/or teachers who have been specifically trained and charged with providing such instruction.

If diagnostic assessment reveals that significant numbers of middle or high school students are struggling with basic skills such as decoding and reading fluency, the school or district must provide the resources necessary to help those students catch up as quickly as possible. This could mean enrolling those students in an extra class period of reading instruction, offering an extended-year program, providing a before-school or afterschool support hour, or the like. Whatever approach is chosen, however, school leaders must be clear and consistent in stating that it is not the responsibility of content area teachers to provide this instruction (unless they are willing and specifically agree to do so).

At the same time, policymakers and education leaders should make it clear that content area teachers *do* have the responsibility to provide instruction in the kinds of reading and writing that are specific to the given academic disciplines

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and that students will need in order to comprehend course materials and complete written assignments successfully.

Further, policymakers and education leaders should ensure that all teachers learn how to use reading comprehension strategies to support content area learning. Any teacher, in any content area, can and should use such strategies when students are having trouble making sense of difficult reading materials, and they should be included in the basic set of skills that every teacher brings to the classroom.

2. Every academic discipline should define its own essential literacy skills.

Traditionally, academic content areas have not defined literacy instruction as one of their core concerns. However, becoming accomplished in an academic field is as much a process of learning to read and write in certain ways as it is a process of learning facts, methods, theories, and other kinds of "content." For example, students of biology must learn how to collect samples, sterilize equipment, dissect specimens, and classify organisms. They must know photosynthesis from bioluminescence, viruses from bacteria, and Lamarck from Darwin. And they must also know how to read and comprehend their biology textbooks and write up their lab notes using an appropriate format, style, and vocabulary.

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If content area teachers perceive literacy instruction to be completely external to their academic disciplines—a set of generic teaching strategies imposed on them from the outside—they will be unlikely to embrace it fully or to make it truly integral to their teaching.

In the ideal scenario, the majority of teachers in every content area will come to regard reading and writing instruction as essential parts of their work, fully integrated with the teaching of discrete "content." But while researchers have come a long way in describing the specific literacy skills and practices that characterize particular academic disciplines and professional groups, there remains much uncertainty as to which content area reading and writing skills are *most* important for secondary school students to master, and which are better left for students to learn in college and/or job training programs. For example, a recent study found that high school teachers and college instructors tend to have very different ideas about what a "college preparatory" curriculum entails, which exacerbates the difficulty of aligning secondary and postsecondary education (ACT, 2007).

Policymakers and education leaders should keep this in mind when working to improve instruction in any particular academic content area. Far too often, those who design programs of support for the teaching of math, science, history, and other subjects neglect to ask what kinds of reading and writing skills are essential to becoming well educated in the given field. But if they truly hope to improve the teaching of biology, American history, or any other discipline, they must devote some portion of their funding and attention to helping identify and prioritize among the things students need to learn in order to read and comprehend their biology textbooks, write compelling historical analyses, and develop the high-level skills that will allow them to pursue postsecondary studies in a discipline or professional field.

3. All secondary school teachers should receive initial and ongoing professional development in the literacy of their own content areas.

As a matter of basic professional competence, all content area teachers should know what is distinct about the reading, writing, and reasoning processes that go on in their discipline; they should give students frequent opportunities to read, write, and think in these ways; and they should explain how those conventions, formats, styles, and modes of communication differ from those that students might encounter elsewhere in school (Pearson, 1996). The best teachers of discipline-based literacy practices are themselves able to read, write, and think like scientists, historians, mathematicians, or specialists in other fields, and they are well aware of the specific challenges that people tend to face when learning to read and write in these ways for the first time.

What can policymakers do to ensure that greater numbers of middle and high school teachers become much more knowledgeable and literate in their own academic disciplines, much more aware of the kinds of reading and writing that go on in those disciplines, and much more comfortable talking about literacy with their colleagues and students?

To some extent, that question can only be addressed as part of the much larger effort to improve teacher quality and effectiveness in general, including specific efforts to recruit and attract well-trained college graduates to join the teaching force; ensure that secondary-level teaching candidates have at least a college major in the field they will be mainly responsible to teach; ensure that new teachers have access to high-quality mentoring and induction programs; and ensure that teacher preparation programs offer a rigorous and well-designed course of study. In order to build teachers' capacity to teach literacy in the content areas, policymakers must build the capacity of teachers, period.

However, the challenge of improving content area literacy instruction also will require that policies address some issue-specific considerations.

First, in states where secondary certification requirements do not include a course on literacy in the content areas, policymakers should consider making at least one such course mandatory. And where such requirements do exist, their syllabi and content should be reviewed in order to make sure that existing courses are preparing new teachers adequately to teach reading and writing in the disciplines (Braunger et al., 2005; Snow, Griffin, and Burns, 2005).

Second, policymakers should continue to encourage districts and schools to refine and improve upon their use of literacy-coaching models of professional development. (Literacy coaching is an increasingly popular approach whereby teachers who have had success integrating literacy into their instruction, or other specially trained educators, are given the special assignment of assisting and/or training regular classroom teachers to provide reading and writing instruction, implement reading intervention programs, assess students' literacy needs, and so on.) While literacy coaching shows great promise as a means of integrating literacy into the content areas, it is a relatively new approach, and the roles and responsibilities of reading coaches have yet to be fully codified and their effectiveness evaluated.

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An important milestone in this area is the *Standards for Middle and High School Literacy Coaches*, published by the International Reading Association, in collaboration with the National Council of Teachers of English, National Council of Teachers of Mathematics, National Science Teachers Association, and National Council for the Social Studies (IRA, 2006). With this document, the professional associations demonstrated a powerful consensus around the need to share the responsibility for literacy instruction in secondary schools. The emphasis is largely on the literacy coach's work in supporting literacy instruction in general, with the coach providing professional development to teachers in all content areas. At the same time, though, the standards make clear that in order to work effectively with teachers in any particular discipline, one must have a solid grasp of that discipline's content, including its particular approaches to reading, writing, and reasoning.

In whatever ways policymakers choose to address pre- and in-service professional development, the guiding principles should be the same: teachers should become more skilled in the kinds of reading and writing that are essential to their own academic content areas; they should become acutely aware of the specific literacy demands that are distinct to their content areas; they should become aware of the challenges that students face when learning to read and write in those ways; and they should have many and ongoing opportunities,

Professional Development in Content Area Literacy Instruction: Promising Practices

Across the country, several projects are currently conducting research into content area literacy instruction, offering professional development to schools and districts and designing new approaches to integrating reading and writing into the preparation of content area teachers.

For promising research, consulting, and pre-service programs, policymakers and education leaders might wish to look to a number of sites, each of which has been subject to rigorous evaluation and research:

The University of Pittsburgh's **Institute for Learning** offers an intensive, three-year professional development program for school-and district-level educators, with a strong focus on literacy instruction in the disciplines. (www.instituteforlearning.org)

The **National Writing Project** has conducted intensive summer seminars and ongoing workshops for content area teachers for more than thirty years. (www.writingproject.org)

Project CRISS, which is headquartered in Montana but works nationally, provides onsite workshops focusing on literacy in content area courses. (www.projectcriss.com)

The Strategic Literacy Initiative, based at WestEd, provides a range of professional development services focusing on reading in the academic content areas, including programs designed for individual schools, programs that group teachers by discipline, and train-the-trainer programs. (www.wested.org/stratlit)

Quality Teaching for English Learners, also based at WestEd, focuses on secondary content area instruction from a disciplinary literacy perspective. (www.wested.org/qtel)

throughout their professional lives, to practice and build those skills and to talk with other teachers about the specific challenges involved in teaching them. If this is to happen, many more teachers will need access to experientially rich demonstrations of specific teaching approaches, such as videotaped lessons or opportunities to observe master teachers. And they will need to make it a regular part of their professional lives to discuss teaching and classroom lesson design with colleagues, with attention to the broader enterprise of helping all students develop as readers and writers.

Ultimately, the most valuable form of professional development may be the simplest. Throughout their careers, teachers must be given opportunities and time to meet with others from their own disciplines in order to study their own content, talk over the challenges they face in the classroom, and discuss effective teaching strategies.

4. Content area teachers need positive incentives and appropriate tools to provide reading and writing instruction.

At present, no state in the nation includes specific reading and writing skills in their standards for each academic content area (ACT, 2005; Lee and Spratley, in press). However, as long as reading and writing are relegated to their own standards document—or solely to the standards document for English/language arts—teachers in the content areas will receive tacit encouragement to leave literacy instruction out of the picture. Drawing from the most current scholarship, then, states and districts should take steps to ensure that their math, science, English, and social studies standards address the reading and writing skills that are specific to the given discipline.

At the same time, it is crucial that open-ended writing and analytic reading items be included in all high-stakes reading and writing assessments, content area tests, and graduation exams. And it is critical also that scoring rubrics reward student writers for adapting their prose to a given purpose and audience, rather than rewarding them for sticking to a formulaic, one-size-fits-all style and format. Developing and administering such high-quality tests can be much more expensive than settling for those that rely on multiple-choice questions, short-answer items, and formulaic writing tasks, but they create much more powerful incentives for teachers to offer more and better literacy instruction, and they provide a much richer measurement of student achievement. Additionally, involving teachers in scoring literacy performance assessments in their discipline can be a highly effective form of professional development.

If standards documents are revised to call for higher achievement in literacy in the academic content areas, then individual schools and districts must also be given the flexibility they need to schedule more time for reading and writing instruction and related professional development. Because that instruction can be quite time intensive, teachers are unlikely to assign more independent reading and writing (and especially drafts and revisions of student work) without significant adjustments in their class sizes, teaching loads, and schedules.

Likewise, schools, districts, and states should provide content area teachers with

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access to more and better reading materials in their classrooms and school libraries. As research from ACT (2005) makes clear, exposure to sophisticated, high-level reading materials is a powerful predictor of student success when they go on to college math, science, history, and other courses. Yet many teachers and students have little access to primary sources, real-world documents, and other disciplinary texts (or they have little knowledge of how to access those texts through public libraries or the Internet).

Further, many schools lack reading materials that are high in interest but low in frustration (in other words, books dealing with topics that are relevant to the content area curriculum and sophisticated enough to appeal to older students, while using language and vocabulary that struggling readers find manageable). Such books should not be used as a substitute for more difficult materials—the goal should be for every student to become skilled enough to read rigorous, high-level texts—but they do serve an important role for adolescents trying to catch up to grade level in reading, and they are far preferable to asking those students to read books meant for much younger children.

CONCLUSION

Across the country, numerous efforts are currently underway to provide struggling adolescent readers with the high-quality interventions, materials, and instruction they need to bring their literacy skills up to grade level expectations.

But if the current adolescent literacy reform movement is to live up to its true potential, it must not stop there, at the midway point between basic literacy and the advanced reading and writing skills that students will need in order to meet their own life goals, college-level standards, and workforce demands. To be sure, securing investments, enacting policies, and creating programs that help low-performing students improve their reading proficiency will be an important victory. But it will not be enough.

According to many prognosticators, economic realities alone should be sufficient to persuade policymakers of the urgent need to help many more students develop much more advanced literacy skills than ever before. As the Education Testing Service (ETS) (Kirsch et al., 2007) warned in a recent report, current labor market trends, demographic projections, and student achievement data combine to suggest a not-too-distant future in which "there will be tens of millions more adults ... who lack the education and skills they will need to thrive in the new economy," leading to unemployment and poverty on a scale that the country has not seen for generations.

The imperative is not just economic, however. Whether those projections turn out to be prescient or alarmist, the public schools must strive to help all students to develop sophisticated reading, writing, and thinking skills. As former chancellor of the University of California at Berkeley and president of the American Council on Education Roger W. Heyns (1984) has noted, "In a very important sense, educational institutions reflect the value society places on children, the aspirations it has for them, and the attitudes, skills, and competencies it expects them to acquire for their own welfare and that of the society itself." If American society, in all its aspects, is to remain strong, it is imperative that all students be educated to high standards.

All students—whatever their background, and whatever success or struggles they have experienced so far—

are capable of serious, disciplined academic work, and to provide them with opportunities to master high-level academic content is the only real fulfillment of the promise of America's public schools.

Educators and policymakers must recognize the significance of the moment at hand. Recently, tremendous progress has been made in calling attention to adolescent literacy; a remarkably unified coalition of researchers and reformers has articulated a number of clear, well-supported strategies for improving instruction, professional development, and school services in this area; numerous district and state-level officials have made a commitment to following through on those recommendations; and legislation to authorize a federal Striving Readers bill has been introduced in Congress, with strong bipartisan support.

All students—whatever their background, and whatever success or struggles they have experienced so far—are capable of serious, disciplined academic work.

Given this extraordinary confluence of attention, effort, and political will, it would be a grave mistake to set sights too low, aiming only to bring greater numbers of middle and high school students to a modest level of proficiency in reading and writing.

The real goal is to help all students master the knowledge, procedures, and skills of the academic disciplines that rule the secondary school curriculum, and which serve as the gatekeeper to success in college, work, and other facets of adult life. Because literacy makes it possible for students to master the disciplines, and because each discipline requires its own kinds of literacy, the next step for those working to improve adolescent literacy instruction must be to integrate the teaching of reading and writing more fully into the academic content areas.

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