Extensive Academic Reading

Extending Opportunities and Support

When I first came to Mrs. Ryan class, I really didn't like to read. I guess because no one really pushed me when it came down to reading. As many books as I have read in Mrs. Ryan class, I just think that reading isn't bad after all. When I use to read and I didn't really understand it, I use to completely stop. Now when I don't understand the text, I think. What I like about reading is that there is so many ways to break it down.

—Harlan, grade 9 student

STUDENTS LIKE HARLAN, who used to "completely stop" when he didn't understand a text, are not beginning readers. Rather, they are highly inexperienced readers, especially at making their way through texts that demand ongoing problem solving—academic texts dense with ideas conveyed through complex sentences and novel or even technical vocabulary—subject area reading.

When Harlan became a student in Cindy Ryan's class, for the first time he was, as he put it, "pushed . . . when it came down to reading." Her academic literacy classroom brimmed with books, and her students read a range of disciplinary texts in history, science, and English language arts along with free-choice reading. Students read in class and at home. Their class embodied the features of extensive reading that translate widely: extend students' opportunities to read in class, extend the types of subject area texts students are supported to read, and increase the opportunities for students to choose texts for their own purposes (both subject area and free-choice texts). The result, from Harlan's perspective, was being able to develop the confidence, skills, and stamina to do the ongoing problem solving that academic text requires. It could even be said that as a result of his evolving reading competence, close reading to solve reading problems became pleasurable, not deadly: "What I like about reading," he reports at year-end, "is that there is so many ways to break it down."

Extensive reading, which was Harlan's experience in Cindy Ryan's class, is the "surround" in which Reading Apprenticeship happens and succeeds. Although the heart of the Reading Apprenticeship classroom is metacognitive conversation, it is only in the context of extensive reading that students have the opportunity to accelerate their development as readers and subject area learners. For students who need to move from being inexperienced to experienced readers, and from disengaged to engaged learners, there is no way around it: they must have extensive, supported opportunities to read, in class.

In this chapter we present a rationale and general guidelines for incorporating extensive reading into subject area classes. By establishing an inquiry culture and metacognitive routines such as described in Chapters Three and Four, teachers can confidently extend students' opportunities to read complex academic materials.

The Why of Extensive Academic Reading

> I wanted students to become the scientifically literate citizens envisioned in the National Science Education Standards: students who read science, enjoy reading science, and even experience the passion I feel for the natural world. However, with 65 percent of incoming freshmen at my school reading below the sixth grade level, it was clear that our science curriculum, especially the textbook, did not include motivating or accessible reading for most students. To bring reading back into our science classrooms, my colleague Ann Akey and I designed yearlong literacy routines and quarterly reading projects that we use successfully with our ninth-grade students, including English language learners.
>
> —Janet Creech, high school science teacher[1]

Janet Creech and Ann Akey had a disciplinary rationale for introducing extensive reading into their grade 9 science course: to offer students a future in which they could read about, understand, and even enjoy science and the natural world. According to Janet, the literacy routines that now anchor students' science learning—keeping metacognitive logs of their science textbook reading, regularly researching self-selected science news reports, and completing quarterly literacy projects and presentations that incorporate reading science-based books of choice—seem to make an important difference in changing students' engagement with science. With extensive reading as the context for all of students' science learning, Janet and Ann feel they are able to serve their disciplinary goals and promote students' literacy more generally. (Their course is described in more detail later in this chapter.)

Extensive reading, when practiced strategically and consistently, *serves the goals of subject area learning* and makes the following contributions to students' growth as readers:

- Academic language and subject area knowledge, as well as familiarity with text structures, genres, vocabulary, and concepts in particular subject areas, are all promoted through extensive reading.

- Fluency, stamina, and the habit of reading are powerfully boosted through ongoing and extensive opportunities to read.

- Choice of reading material, which extensive reading makes possible, contributes greatly to motivation and engagement.

- Work to comprehend academic texts with the collaboration of peers and with teacher support for modeling and metacognitive conversation helps students build text-based problem-solving skills and dispositions for engaged subject area learning. Sharing reading through book talks, presentations, text-based group discussions, and other public experiences builds excitement and interest among a community of readers.

- Increased reading experiences help students gain insight about themselves as readers and about their preferences in reading materials.

By definition, extensive reading takes time. Yet the *time* students actually spend reading and working to comprehend texts makes the single most important contribution to their reading achievement and proficiency.[2] Sadly, as teachers know, the amount of time students spend engaged in reading inside and outside of school has decreased in recent decades. Reduced reading opportunities means that students' reading competence and confidence both suffer. Without experience in making sense of academic materials, students will lack familiarity and stamina when faced with complex texts. Understandably, they will have little motivation for working their way through difficult material. Without access to the knowledge and academic language conveyed in texts, their ability to comprehend a greater range of texts will be limited. This in turn often leads teachers to lower their expectations for students' reading, thereby continuing the cycle.

Without ongoing and supported reading experiences, students stop growing as readers and even lose ground. To interrupt this downward spiral, teachers will need new and more powerful ways to bring reading back into the curriculum and the classroom.

Jane Wolford, whose community college students enroll in her history classes with little preparation for the kind of extensive reading that historians enjoy, decided to help them bear down, take on multiple disciplinary texts, and perhaps even have some fun. One of Jane's biggest challenges was students' reaction to primary sources. By taking the time in class to have students read closely and think like historians, Jane helped them build the motivation and skills to tackle and understand challenging text. She describes in Classroom Close-Up 5.1 what she and her students discovered.

CLASSROOM CLOSE-UP 5.1
Learning to Read Across Multiple Texts

Typically, the community college students in Jane Wolford's U.S. history classes were resistant and inexperienced readers of history. Most found history irrelevant. To change students' attitudes and ease them into reading like historians, Jane used reciprocal modeling of the Think Aloud to take difficult texts—especially primary sources—apart line by line. The metacognitive conversations that resulted were a revelation—to Jane and especially to her students.

"Most of my students don't know how to approach a primary source document. I didn't realize it and had been throwing them into the deep end of the pool without water wings. They were just sloughing it off: 'I can't do it, so why even try?' Now I model it, and we work through the text. They are a lot more apt to talk when you do a line-by-line reading together and show them how historians think. It leads them to think they might be able to do it.

"We were reading a famous letter by Abigail Adams to her husband, an early feminist plea— 'Remember the Ladies'—an appeal for more equitable distribution of power. One of my students, not what I call an academically minded student, stunned herself by the realization that she could understand the letter in its historical context: 'Maybe during her time, what she said was bold. Maybe what she's saying will be important in the future.'

"To me, the key is building students' confidence. So much of it is letting them know they can go for it."

In addition to line-by-line reciprocal modeling, Jane builds students' confidence and skills by having them Talk to the Text, source texts, and keep metacognitive logs. Her students' experiences have led her to introduce Reading Apprenticeship to her colleagues.

"A lot of people question me when I describe what we do. 'You're taking forty-five minutes to cover one primary source document?' But there's much more learning going on, much deeper reading. And we don't have to do a line-by-line reading after a certain point."

In one unit essay, for example, Jane's students pull together content from four primary sources, three secondary sources, a hereditary genetics map, and their world knowledge of racial politics to argue whether or not Thomas Jefferson fathered Sally Hemings's children. For Jane's students, as history became accessible, it also became sort of interesting!

The What of Extensive Academic Reading

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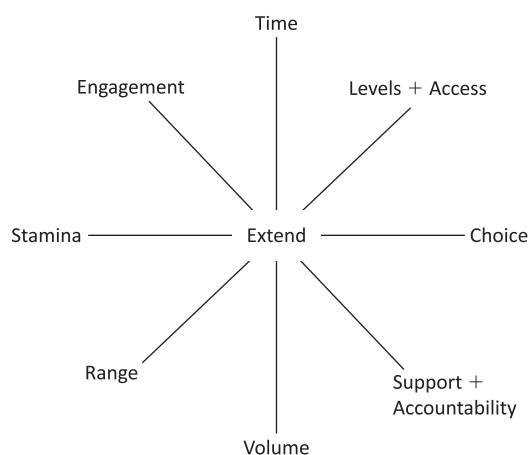
In this representation of extensive reading, the teacher and the student have different but interacting roles. Teachers extend the *time in class* for reading—and rereading—academic texts to serve subject area learning goals. By extending the reading *levels* of texts, teachers provide differentiated readings as well as a ladder of increasing challenge. Teachers also extend *access* to academic texts by using ancillary topic-related materials to add interest and varied entry points. Teachers extend students' *choice* of what to read through thematically linked texts or independent reading projects. Creating *support* for extensive reading, in terms of the classroom social and personal dimensions and a focus on meta-cognitive conversation, allows teachers to extend what they expect of students, to extend students' *accountability* for reading.

When students have more time for subject area reading, they are expected to extend the *volume* of reading they accomplish. With the teacher providing increased access to different levels and types of texts, students extend the *range* of what they read. As students read more and more kinds of texts, they extend their reading *stamina.* As students extend their stamina for reading longer and more challenging texts, in combination with extended opportunities to make choices about their subject area reading, they become more competent readers and, presumably, more *engaged* subject area readers.

By extending the opportunities and support for student reading, teachers see a transformation in the roles they and their students assume. High school English teacher Lisa Krebs expresses relief that now reading is a class activity and not only something students are supposed to do for homework. As a result, her goals have changed from managing and entertaining students to supporting them in their own reading, thinking, and problem solving:

> I think back to when I was early teaching, and I mean, I was doing everything. They were sitting there, sometimes with nothing on their desks the whole period. And I'm sort of telling them about the story, and showing them visual aids, and doing this, and running around, and passing out [things], and, you know, it was crazy. And they're probably thinking, "Doo da doo, I don't have to do anything."

When classrooms are places where teachers do things *for* students or *to* students, teachers are doing all of the intellectual work. When classrooms become places where teachers do things *with* students, the intellectual culture of the classroom shifts, and students have a purpose for investing in learning.

The Student Learning Goals for Building Personal Engagement (see the Assessment Appendix) make clear to students a number of ways they can think about extending their reading effort and evolving a more powerful reader identity.

Extending Time for Reading Disciplinary Texts in Class

As Lisa Krebs just described, teachers often assign reading of curriculum materials for homework and review them during class, with the result that many students avoid the reading and simply wait for the review. Depending on the class, the teacher's goals, and the time in the school year, bringing reading back into the classroom may mean any of the following:

- Students spend time reading these materials *during* class, either individually or in small groups.

- Students work together in class to make sense of key passages selected by the teacher from the core text.

- Reading may continue to be assigned for homework, but the class may work together on making sense of some or all of the assigned reading material during class time. The teacher may be actively involved but is coaching and facilitating the meaning-making process without reviewing or summarizing the text for students.

- Research and reading become an integral part of project-based learning, with the teacher choosing to spend more time actively engaging and supporting students' reading in class, and students spending more time working on projects as homework.

When students have time in class to uncover text comprehension problems and work toward solving them with the help of their teacher and peers, teachers have the opportunity to help students understand key concepts and information in the curriculum. When students are supported in reading their course texts, the texts become the resource for accessing subject matter that they are intended to be.

Early in the year, teachers may want students to spend a high percentage of class time engaged in reading and debriefing their reading of course materials. When the emphasis on reading disciplinary texts and finding ways to understand them becomes a classroom standard, teachers can become more selective about which texts or chunks of text to explore as a class or at length.

Gina Hale made decisions not only about which parts of the grade 7 history textbook to focus on, but also about how to engage a hugely diverse group of students in becoming passionate readers of history. She quickly came to appreciate that by limiting her use of the textbook to standards-based "essentials," she had time for students to read other disciplinary texts—carefully chosen with students' different needs in mind—that would bring the essentials alive. (See Classroom Close-Up 5.2.)

CLASSROOM CLOSE-UP 5.2

Supporting the Textbook with Differentiated Reading

Gina Hale admits that because she tried to "cover" the entire history textbook with her seventh graders, she had no time for extensive reading. One class changed everything.

"That year, I taught an English language arts–history core class with one-third special ed, one-third English learners, and one-third GATE [Gifted and Talented Education] students. I had nonreaders and students reading above grade level in the same class.

"At the time, I was operating on the idea that kids had to read the textbook, front to back. But that year, I needed a different plan—more kids than ever were not reading or doing homework, and way too many were failing.

"In desperation, I decided to try extensive reading. I could see that it was the only way to get my kids all reading about the same topic. I spent several afternoons with the school librarian selecting supplementary text sets at different reading levels related to my history content. At first it was a lot of work, but by the end of the year she was so excited that she created units of extensive reading for the whole seventh grade. Rather than having us sign up for library, she brought the text sets around to our classrooms. It became a real collaboration.

"Still, I didn't want to just dump the textbook, so each chapter I selected a few sections—only a few pages in the beginning, but more later—that covered the essential content standards. In pairs, students took turns reading and thinking aloud. As a class we talked about what partners discussed. It was clear that comprehension was improving, that they were reading, but I could tell from their talk that many students were not *really* engaged in the reading. I was pretty discouraged!

"The unit on medieval Europe was a turning point. The textbook had a feature on castles, so I chose that, hoping it would be interesting, perplexing. I knew students would have a lot of Disney-type schema about castles, but this section in the textbook zoomed in on how difficult and unpleasant it was to live in castles.

"After the partner work, when I asked students what they figured out about the reading, naturally their first responses were about the details selected to most appeal to a middle school audience—they enthusiastically recounted the horrors of the chamber pot. I was amused, and thrilled, by their engagement.

'Okay,' I said, 'but what did you figure out about *reading*, not castles?' Doreen, a GATE student who read well enough but typically with very little interest, responded, 'You have to really read it! It's interesting if you *read* it.'

"During that same unit, I put students into four-person research groups to support guided writing projects. They were gathering information for short stories that would take place in medieval Europe, and each student would be his or her own main character. One group included two special-ed students and two GATE students. Francisco was really smart, but a visual processing disorder made reading hard enough that he had just quit trying. Paulo read word by word, at a first-grade level. And then there were Tami and Julie, both academically successful students who nevertheless were in the habit of reading just enough to finish an assigned task.

"For resources, in addition to the textbook, they had the text sets the librarian and I had built. Paulo started with a picture book about knights, Francisco chose an illustrated encyclopedia about castles. Tami and Julie were reading a biography of Eleanor of Aquitaine and expository books about medieval court life and textiles. By the end of the unit, Paulo was reading Francisco's encyclopedia, Francisco was cross-referencing the textbook, and Julie and Tami were asking the two boys for information on knights.

"All this research and writing meant that students were rereading—to get writing ideas, check facts, or find information to share with someone else. They were building fluency, an incredible amount of schema, and stamina. And, they were engaged. Intellectually. In work.

"Over the course of that year, it became clear to me that few of my students would ever get passionate about history because of the textbook. When I decided to make more time for differentiated reading, I saw my nonreaders become readers and my good-enough readers become avid readers.

"In his end-of-year reflection, Paulo, who began the year reading at a first-grade level, wrote, 'I got better at reading. I read a book for the first time. Now I know I am not stupid. I can read.'

"*That's* what extensive reading does for students."

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Extending Levels and Access for Reading

While course texts are resources for student learning, they also have limitations. The one-size-fits-all reading level of textbooks assumes a more homogeneous classroom than is often typical. Textbooks also suffer from a lack of specifics, a characteristic fault that has been called "mentioning rather than explaining."[3] To address such issues, many teachers, such as Gina Hale in Classroom Close-Up 5.2, supplement their course materials with vertical text sets that provide a range of entry points and horizontal text sets that provide more detail or different perspectives about a topic. Many text sets have both vertical and horizontal characteristics—differentiated reading levels and thematically related auxiliary texts.

Vertical Text Sets

To address the range of reading abilities in a class, vertical text sets present text about a particular topic at a range of difficulty levels. With vertical text sets, teachers can offer comfortable starting places in the curriculum to students who have different experiences and proficiencies as readers. This kind of differentiation is familiar in the instruction of English learners and in special education.

A vertical text set can serve as a ladder that allows students to progressively increase their range of reading comfort and their reading proficiency. At the same time, of course, by reading easier and then more difficult text passages about the same topic, students begin to build and elaborate subject-specific knowledge and vocabulary. Schema developed from reading a less difficult text are in place to help students in making new connections when reading a related but more complex text.

A collection of publishers' competing textbooks can be a valuable resource for creating vertical text sets. That is what Stacey Tisor realized when she was on her district's biology textbook adoption committee:

> I was teaching tenth grade biology and my students were at all different levels. I had some who were honors students—but not in science—I had general ed students, students well below grade level, and English learners who were close to being reclassified. The range meant that a single textbook was not going to work. But fortuitously, I was on the biology textbook adoption committee. Publishers were sending all these textbooks for our review, and I realized they were all written at different levels. In addition to the one we chose for adoption, I found three of the others that I used to make text sets for particular topics.
>
> Whatever the topic, everyone read the adopted text first, which was written at a level somewhat higher than tenth grade. I set the reading up with an anticipatory guide related to the lesson objective, so students

knew what to focus on. With some topics, everyone then got a second text. I put students into small groups, with the text best matched to their reading level. I had one textbook at a college level, another at a "normal" level, and a third that was low middle school/elementary.

For an evolution unit, I asked students when they finished their "leveled" text to try the next hardest text. Interestingly, it was the students reading at the lowest levels who were the most motivated to try to move up to the next level text.

Stacey is no longer in the classroom, but as a professional developer for her school district, she passes along her experience building text sets from textbooks and also shows teachers how to use the Internet to build text sets.

An activity that asks students to explore a vertical text set gives them the metacognitive experience of identifying the factors that make a text difficult or accessible, both generally and to them in particular (Box 5.1 lists a number of these factors). The activity, described in Box 5.2, asks students to rank the accessibility of texts, explore the factors contributing to their difficulty or accessibility, and set goals for moving up the ladder of text difficulty.

BOX 5.1

What Makes Text Difficult?

Readability measures provide broad indicators that can help teachers match texts to students. A readability measure, however, cannot account for a given student's ease or difficulty in reading a particular text. All of the following contribute to a student's experience of text difficulty or accessibility:

Language: Vocabulary contributes to text difficulty according to the density of unfamiliar, abstract, polysyllabic, and technical or highly specialized words. The words that will be unfamiliar in a given text vary, depending on each student's schema.

Sentence length and complexity: Long sentences are measured as harder to read than short sentences, but complex sentence structure also affects difficulty. In addition, when sentences are adapted or limited in length simply to keep them short, the loss of transition and amplifying words and phrases can actually make them harder to understand, a charge sometimes made about texts for English learners.[4]

Conceptual difficulty: Conceptually, the difficulty of a text depends on how abstract its ideas are and the amount of prior knowledge they require. Individual students bring more or less schema about particular information, ideas, or concepts.

Idea density: The density of ideas in a text and the ways in which they are embedded affect text difficulty. Textbooks, for example, pack in and relate ideas for maximum coverage, not necessarily for maximum comprehension.

Relevance: How important is this topic to the reader? Texts about motivating topics "feel" less difficult.

BOX 5.2

Exploring a Vertical Text Set

PURPOSE

When students read a set of increasingly difficult texts about the same topic, they learn to recognize the factors that make texts more or less accessible. In addition, by reading texts at different levels of difficulty, students can understand how reading multiple texts about a topic builds knowledge and fluency.

PROCEDURE

1. Collect a set of texts (four or five) on a single topic—the New Deal or prevention of diabetes, for example. The texts should represent a range of difficulty appropriate to the students in your class. In the set of texts, you might also vary the text types, choosing examples from textbooks at various grade levels, magazines, newspapers, and the Internet.

2. Give students about twenty-five minutes to work in small groups and explore the various texts. Ask students to skim the documents and take notes with the following two questions in mind. Explain that groups will then discuss their thinking about what makes text difficult and create a poster explaining their reasoning.

   - How would you rank these texts in terms of their accessibility (ease of understanding) or inaccessibility (difficulty of understanding)? Why? What features of these texts are you considering as you make these judgments? Please make a group poster that reflects the features you discussed.

   - Which texts in this set would you be most comfortable reading? Which ones do you think you could read with some support?

3. With the class, debrief students' insights and any issues they raised in their groups, and lead a discussion of the following:

   - If you and your classmates read different texts on a topic and then meet in small groups to discuss what you learned and share questions you have, how might this help you learn about the topic?

   - If you are given a choice of texts to read on a topic, how do you decide which one(s) to read?

4. Ask students to set goals for extending their academic reading range and proficiency by selecting from the text set a starting text and the order in which they will read any of the other texts.

Rita Jensen is able to increase the challenge of the texts her middle school ELD students tackle with very deliberate attention to the support available from students' interest in a topic:

> I increase the length and difficulty of the text while keeping the subject very high interest. What I expect from students increases, but support is built in.

Horizontal Text Sets

Teachers who create horizontal or thematic text sets recognize that different perspectives, supplementary content, and even different genres can be more

accessible than a core text—and build schema that make the core text itself more accessible and meaningful. Horizontal text sets are a widely used way to build interest, background knowledge, and vocabulary. They can also include texts differentiated by difficulty level, combining characteristics of vertical and horizontal text sets.

In her middle school social studies class, Laurie Erby worried that her students' textbook chapter about transboundary pollution was not helping them understand the danger of global hazards like acid rain, water contamination, and nuclear fallout. To extend her students' reading, and give them a different perspective on these environmental issues, Laurie used a text set comprising interviews with survivors of the Chernobyl nuclear explosion. For students, the interview text structure was familiar and accessible, and the first-person perspectives made "transboundary pollution" concrete. The interviews had the additional advantage of varying in difficulty, depending on the subject and speaker of the narrative. Laurie describes this particular instance of extensive reading in Classroom Close-Up 5.3.

CLASSROOM CLOSE-UP 5.3
Transboundary Solution

A textbook chapter on "transboundary pollution" is not what anyone would call an inherently captivating read for seventh graders. As she explains here, Laurie Erby extended her students' reading and understanding of transboundary pollution with texts that presented first-person interviews of Chernobyl survivors.[5]

"Reading in social studies is not always high-interest reading for students. There's a lot of information in the text, and it's very dense.

"The chapter that we've been working on is on transboundary pollution. . . I felt that at the end of the chapter, students really didn't have a feel for the seriousness of these incidents, particularly Chernobyl.

"My goal . . . was to really give the students a better feel for what it was like for survivors of Chernobyl. The texts that I used were different survivor stories."

These interviews included descriptions of young men who repeatedly dove into radioactive water to open a valve and prevent an even more disastrous explosion, a girl's humiliation at a camp where the other children (not from Chernobyl) refused to touch her, and a scientist who measured but did not warn local people of the radiation in the milk and meat they continued to consume.

Laurie had students read their particular interview, Talk to the Text, share their ideas and questions about the text with a partner who read the same interview, and then exchange information about their interview with a group in which each student had read a different text.

"In sharing their stories," Laurie relates, "they're looking for similarities and differences . . . so they're really getting a full feel for what happened to a lot of different people and a lot of different perspectives here. The listeners are going to ask clarifying questions, and then the presenter has a chance to answer them. So if they didn't understand something that the presenter mentioned, they can ask, 'Gee, what did you mean by this?'"

Laurie's students then wrote a reflection tying in what they learned in the textbook with what they learned from the various Chernobyl stories. By reading, reconciling, and synthesizing multiple texts, Laurie's students gained a deeper understanding of transboundary pollution than reading a single textbook treatment or single survivor story could ever match.

English teacher Chris Van Ruiten-Greene's high school students are required to read core literature that many of them see as more than a little fusty. She creates horizontal text sets to build students' interest in the themes and issues that a core text raises and to clear away some of their preconceived notions about the core text's possible relevance.

With each class, before putting a text set together, Chris invites students to discuss what they know and what questions they have about the particular core text. With Alan Paton's *Cry, the Beloved Country*, for example, Chris says students typically don't know much about the book except they can see by the copyright date that it's "old." Their questions often focus on their sense of Africa as "messed up" and their puzzlement about why movement toward racial equity in South Africa was so long delayed: "Didn't they protest?" "Who was their Martin Luther King?" Then, depending on students' questions and relevant current events in South Africa and the United States, Chris creates a thematic text set of what she calls "orbiting" texts. They vary by topic, text type, and difficulty, but they are tied together by essential questions the students raise and a set of themes and potential writing topics that students generate.

> For seniors reading *Cry, the Beloved Country* in my world literature course, I extend the core reading with varied-difficulty texts for a wider view of the central themes and issues presented in the text. I choose orbiting texts to build interest, answer student questions, extend our theme discussions, and make the core reading *relevant* to postmodern concerns.
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> Excerpts from *Guns, Germs, and Steel* really get them riled up, as do chapters from *Kaffir Boy,* racial issue articles from Johannesburg's *Daily Rand*—of which there are a plethora—and excerpts from *No More Strangers Now: Young Voices from a New South Africa.* I vary it every year, depending on students' questions and what our own American issues are in parallel to the themes we are considering. Students consistently identify themes related to the trap of poverty and its toll on human potential and dignity, the irony of achieving wisdom through enormous loss, and the shallowness of the perceived ethnic and cultural differences that set groups of people against each other—at great cost.
>
> Students respond to the orbiting texts with personal reads and logging, partner discussion, sharing out, becoming a group expert on one of the *Cry* themes, and presenting to others on topics from the orbiting texts—about AIDS or race relations, for example.
>
> The text set makes an *enormous* impact on their reading of the core text. They see why this book is still relevant and how it broadens their sense of the world and equity and raises the complexities of how to get along despite our differences. The orbiting texts make the "old" story provocative and real. They spark and fuel classroom discourse because of the issues all students connect to.

Thematic text sets might well include visual texts such as documentaries, photographs, drawings and illustrations, and physical models that extend students'

understanding of text materials and vocabulary as well as the concepts under study. The same metacognitive routines students use to support their comprehension of connected text—metacognitive logs, double-entry journals, Talking to the Text, and Think Aloud—can likewise deepen comprehension of visual texts.

In Classroom Close-Up 5.4, ninth graders in Allie Pitts's history class read across a set of propaganda posters, not all of them written in English, to understand an inquiry question the posters suggest.

Textbooks as Text Sets

Textbooks themselves offer abundant opportunities for extending students' access and range as readers. A flip through the pages of a science, history, math, or English textbook will quickly reveal a variety of text types and ways of representing information. Gina Hale, in Classroom Close-Up 5.2, describes choosing sections of her history textbook for students' reading based on important content standards that students are expected to master. Teachers can also choose sections of their textbooks for class reading and focused problem solving with an eye toward "easing in" to new topics, conceptually difficult territory, or dense academic text.

With a new science chapter, for example, if students first read and Talk to the Text with the visuals, they have an opportunity to build schema for the concepts and terminology they will encounter in the chapter as a whole. Reading the visuals in this way supports students' next pass through the chapter and their close work with the connected passages of text. In small group or class discussions of the visuals they have read, students can raise questions that provide reasons to read the less immediately appealing portions of the chapter—for instance, to clarify uncertainties, to learn something that has intrigued them, to see how the textbook explains an interesting process they encountered.

Similarly, teachers can choose a particularly telling excerpt of a textbook for close reading and problem solving, ask students to work in pairs or small groups on it, and then bring the class together for further clarification, problem solving, and discussion. By breaking down long passages into manageable segments and supporting students to use Think Aloud, Talking to the Text, and partner and small group discussion to grapple with the chunks, teachers give students considerable experience with academic reading. The textbook used in this way becomes a rich resource for learning, with multiple opportunities for students to read, reread, and work their way through the challenges these texts present.

Community college mathematics teacher Laura Graff uses her textbook as a text set by having students outline chapters. Students take a first pass through with a metacognitive lens: What do I think is important here, how does it relate to other information in the chapter, and how is the text helping me understand? In Classroom Close-Up 5.5, Laura describes how students learn to use their textbook as a tool for learning, not simply as a collection of homework problems.

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CLASSROOM CLOSE-UP 5.4

Disciplinary Inquiry of the Day

Students in Allie Pitts's ninth-grade history class are studying World War I. As they come into the room, the disciplinary inquiry of the day is written on the board: "How did countries use national pride to convince men to join the war?" The texts for the day are a set of primary source propaganda posters from different combatant countries.

Allie and her students work through understanding one poster in a reciprocal model, with Allie recording in two columns for the class "What We Know" and "How We Know It." Allie has students move back and forth between whole class and partner discussion.

She also encourages students to notice questions that occur to them and decide what to do about them: Is comprehension blocked without an answer, or can they work through the ambiguity or their curiosity?

Students write their questions on sticky notes that Allie collects and projects from the document camera. Yellow notes are for "crucial" questions, and orange notes are for questions whose answers students can "live without" for the moment. The class works through one student's "yellow" question and sees, along with the question's originator, that they can leave the question unanswered and still make meaning.

Students then work on a new poster with partners. Two large figures dominate: a knight and a monster. Most partners recognize that the poster is British and that the knight represents Britain.

Allie brings the class together. "Okay. The general agreement seems to be the knight is Britain. What does Britain want you to do? We are going to go back to do some historical thinking. Who is the *audience* for the poster?"

Allie then takes the class through a reciprocal model of identifying this particular text's audience, message, and purpose. When partners continue to work on the posters, they use a note taker that specifically supports this historical thinking; they also continue to keep track of "What We Know" and "How We Know It" and write their questions on sticky notes.

Ben and Pearl are partners "reading" a poster written in Cyrillic:

Ben: What do the words mean?

Pearl: I don't know

Ben: That is important.

Pearl: Could this be Britain?

Ben: This guy is ordering this guy to fight the bear.

Pearl: This seems like Britain or France.

Ben: I think it is a pretty important question: What do the words mean? (*Writes his question on a yellow sticky note.*) I think these two are in the Alliance and these are weaker. They are being forced into fighting the really scary country.

Pearl: What country does the bear represent?

Ben: I'm guessing that this guy is German because he has a pointy helmet [the teacher has told students earlier that Germans had pointy helmets].

Pearl: (*Looking at the large map on the front board*) So if this is Germany, then this is Austria or Ottoman.

Ben: I think it's Austria.

Pearl: Then the bear is Russia. Right, because it is Austria's fault and Germany just tagged along.

Ben: I'm not sure who it is trying to convince.

Pearl: Well, the poster is Russian. So they are making themselves look good.

Ben: So the audience is everyone else?

Pearl: But it is in Russian.

Ben: Why, then?

Pearl: To support themselves.

Ben: And to say that everyone else is afraid of them? I don't think that is right. Why would you make a propaganda saying everyone is afraid of us?

Pearl: To motivate them.

Ben: Oh, to motivate their soldiers. People think they are strong. They want to be part of strong armies.

Pearl: Yeah.

Partners read, discuss, and take notes about two more posters. The culminating activity is to answer the day's inquiry question, "How did countries use national pride to convince men to join the war?" It's a piece of cake for students who have already interrogated the posters with a disciplinary sourcing routine and collected the relevant evidence.

CLASSROOM CLOSE-UP 5.5
Making Textbooks Their Own

Laura Graff teaches college mathematics, but most of her courses are at a precollegiate level. Her students have struggled with math and often do not know how to read or use their textbook as an assist to understanding. As Laura describes here, she and two colleagues in the math department hit on chapter outlining as a way for students to become metacognitive about reading mathematics.[6]

"I have always thought a large problem in math and science education is reading. Students are never taught how to read technical textbooks."

Laura was not sure exactly how she had learned to read mathematics texts, but she knew it had been important to her understanding of math. She wanted her students to be able to see that the value of their $130 textbooks was for more than instructors' convenience in assigning homework problems.

When an invitation to attend Reading Apprenticeship professional development showed up in the math department mail, Laura was intrigued. She, and then two other members of the department, decided to attend. What they took away was the importance of promoting students' metacognitive conversations with the text.

To put this new understanding into practice, they designed an inquiry project to test the effectiveness of "forced metacognition." Students would be required to outline textbook chapters as a means of discovering why their math textbooks actually have *words* between the numbers.

"When outlines are first assigned," Laura says, "we are deliberately vague about what to include." What they do tell students is to think of the textbook headings as questions, to use the text to answer the questions, and to make notes of key concepts and definitions.

"The students write very detailed outlines in the beginning and evolve to skeletons of [what they think of as] 'hurried' outlines. They are actually showing how much progress they have made towards quickly picking out the key points."

"We believed that for students the process of asking questions and seeking answers to determine a hierarchy of topics—and, ultimately, produce an outline—would result in a metacognitive awakening of sorts, as they begin to build confidence and view themselves as independent thinkers.

"At the end of the inquiry, as we analyzed student outcomes, we were amazed at the positive results." Still, it was only when students spoke to a video camera about the outlining process that the instructors absorbed the full power of what students had experienced. Laura recalls it as "one of those huge 'paydays,' where you realize you have made a difference in students' lives and learning."

In brief excerpts from their videotaped interviews, three of the students who learned how to "outline" their thinking explain:

"Normally I would just look at the problems. I would completely disregard anything the book had to offer. I think being forced to do the outlines makes me realize that in every book, there is so much more information that you can notice. I apply it to every subject," Elisa reports.

For Anita, the metacognitive conversations she had with her textbook brought an immediate boost in comprehension: "As soon as I started doing the outline, I understood it a whole lot better. It took half the time for me to do the homework." She also found that outlining works out well in more than mathematics classes. "It also helped me in my physics class. I got a B—from a D to a B."

Alyce, who was repeating the developmental math course, had a wry perspective on her experience: "I've taken this exact same math class with another instructor and not had to do outlines, and he never actually asked us to open the book except for homework. So I never looked at that whole chapter itself. I only looked at the problems that were assigned for homework. That was the only time I ever opened the book—and look where it got me—in the same class with a different teacher. The fact that I'm doing [outlines now] is kind of putting it into my head so that I remember it."

Comparison Text Sets

Another form of thematic text set extends access by inviting students to compare the decisions made by authors and/or publishers. Especially revealing in history and other social sciences where interpretation necessarily varies the presentation of information and events, comparison text sets encourage students to notice differences in how texts relate similar information in different ways, focus attention through choice of photographs or headlines, and emphasize, include, or exclude different details. For example, one textbook's coverage of women's suffrage might include a photograph of men supporting the suffragist cause, whereas another might picture only suffragettes. One might describe religion as a factor in how women's rights and roles were understood; another might instead include information about Frederick Douglass's support for universal suffrage.

Students will need help making these comparisons. Keeping a log is one way for them to compare two or three texts: Is one easier to understand? More interesting? What makes it so? What is the effect of particular decisions to include or leave out certain information? Teachers also find that it is helpful for students to reflect on (1) what they know about a topic before reading, (2) what they learn from reading a first text on the topic, and (3) what they learn from reading another text on the same topic. This reflection allows students to recognize that their understanding grows the more they read about a topic.

Text + One More

A text set exists any time a topic is presented to students through more than one text. Minimally, then, adding even one ancillary text to the core text (usually a textbook) coverage of a topic means more access to the topic. Ideally, if there is only "one more" text, it is a text that offers immediate access—a photo, map, quote, short excerpt—for starting to build students' key conceptual knowledge, background knowledge, or vocabulary.

Starting small, with Text + One More, can be a worthy goal for teachers who want to experiment with text sets. (Fair warning: Text + One More has been known to morph into Text + Two More, Text + Three More, and so on. Building text sets is just like that.)

Inquiry Questions for Reading Across Texts

When students read across texts, inquiry questions serve an important role of increasing students' access to the key ideas and implicit relationships that have caused the texts to be put together in the first place.

The ninth graders reading a set of propaganda posters in Classroom Close-Up 5.4 were guided by the inquiry question "How did countries use

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national pride to convince men to join the war?" The inquiry question provided a purpose for reading and let students know how to focus their attention.

Chris Van Ruiten-Greene's high school seniors generate their own inquiry questions for a unit in which *Cry, the Beloved Country* is the core text. The questions they come up with are deeply thematic in nature: How does poverty trap and diminish people? Why do superficial differences between groups of people take on such import? How can loss produce wisdom?

The seventh graders in Lisa Rizzo's honors English class warm up for a lesson that entails comparing two poems with an inquiry framework that focuses them on the distinctive ways poetry communicates. Students write to the prompt "Writers might use poetry to speak to readers in a different way because _____." They then read the poems, primed to recognize and compare the poets' use of figurative language. Classroom Close-Up 5.6 drops in on a group of four students working collaboratively to understand the poems and also how the poets "speak to readers."

Extending Choice of Reading Material

Giving students some choice of reading material, even if limited, can help motivate them not only to read texts they are able to choose for themselves, but also to return to required course materials with more schema and more interest.

As described earlier, Chris Van Ruiten-Greene creates horizontal text sets that support students' reading of a core text and allow for a certain amount of student choice: in addition to the core text and certain "orbiting" texts that all students read, students choose, from among optional orbiting texts, those that will support them in becoming a group's "expert" on a particular topic or making a presentation to the class about a self-selected thematic interest. Other ways in which teachers extend choice of reading materials include subject area sustained silent reading and projects.

Subject Area Sustained Silent Reading (SSR)

SSR time has not traditionally been a part of subject area classrooms, but this is another way to provide students with multiple texts and extensive reading opportunities (see also Chapter Six for a more extended discussion of sustained silent reading).

Many subject area teachers use particular activities at the start of the class period to quiet and focus students. Sustained silent reading of topic-related materials students have chosen can become one of these regular activities. To the extent that these texts are linked to curriculum units, students are learning the content while also reading more widely and extensively in the subject area. To link the reading even more explicitly to the curriculum, teachers may

occasionally facilitate conversations about what students are learning, or they may ask students to keep reading logs that address particular questions.

If teachers have classroom libraries with a variety of texts linked to curriculum topics, SSR can become part of any subject area class. High school biology and biotechnology teacher Ericka Senegar-Mitchell has created a set of eight

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CLASSROOM CLOSE-UP 5.6

Framing an Inquiry into Two Poems

Primed with an inquiry frame, "Writers might use poetry to speak to readers in a different way because _____," the seventh graders in Lisa Rizzo's honors English class undertake multiple readings of two poems, making metacognitive notes to understand *what* the poets are saying and then to notice *how* they are saying it.

At one table, two partnerships informally work as a group of four, discussing the first poem, "The Courage That My Mother Had," by Edna St. Vincent Millay. They go back and forth between clarifying their understanding of the poem and noticing figurative language:

Bella: My reaction, I think she misses her mom. She obviously respected her mom a lot. She wants her mom??? What's granite? I want to put it like a question. Is she scared of something?

Gavin: "Courage like a rock." Is that courage solid as a rock?

Bella: It means her mom has a lot of courage.

Morris: What about "granite hill"?

Bella: Granite is a type of rock.

Gavin: This is about her mom having courage.

Lucy: Did you find other literary devices?

Bella: The brooch is like a symbol.

Lucy: I think it [the brooch] means that the courage will stay. She'll always be remembered.

Bella: Did she pass away?

Gavin: Yes. What is "courage like a rock"?

Morris: She doesn't have courage now. *(Paraphrasing the poem)* Which she has no need of but I do have need of.

Bella: I get it. She needs courage because she misses her mom. I finally understand the poem.

She needs the courage since her mom passed away.

Lucy: It also shows that she really admires her mom.

As students begin the second poem, "Mother to Son," by Langston Hughes, they do not get very far into the poem before their attention splits again between *what* the poet is saying and *how.*

Bella: It's a guy writing.

Lucy: Maybe he is putting the advice from his mom into a poem.

Bella: He is writing it down, oh, my mom told me this.

Gavin: Oh, Langston Hughes was the son and this is him from his mother?

Bella: I think that she is using the stairs as a symbol of life.

Gavin: How do you come up with that?

Lucy: What are some of the hard things that she has gone through?

Bella: Maybe her son is going through a hard time and she is giving him advice.

Gavin: What is a "crystal staircase"?

Bella: It's a symbol. Is that a symbol or metaphor?

When Lisa asks students to put the poems away until the next class and begin silent reading in *Roll of Thunder, Hear My Cry* (an assignment students will continue for homework), they petition to keep working on the poems instead. Lisa gives groups this option but points out that they will have even more *Roll of Thunder* homework if they do not get started on it now. About half the groups opt to continue their poetry inquiry, intent on solving the problems of interpretation and figurative language that they are discovering.

classroom mini-libraries that she rotates with each new biology unit. She displays her collections of journals, magazines, brochures, flyers, pamphlets, posters, and books (which she continually adds to) on two tables, one inside each of her two classroom doors. "Buffet tables," she calls them, and the metaphor is apt. Anything on the tables is available for consumption. The buffet is popular grazing before class, and students can have or check out whatever they choose. "With the right connection," Ericka explains, "they will read." In Classroom Close-Up 5.7, Ericka describes how she maintains her buffet tables and how students use them.

To promote extensive reading in U.S. history and American literature, teachers in Dixon High School's history and English departments enlisted the help of the school librarian and put together a collection of leveled books that support their combined course content. Students, including English learners and mainstreamed special needs students, chose books from the list to read during a daily twenty-minute SSR period that alternated weekly between students' history and English classes. Teachers of both courses read and responded to parts of students' metacognitive reading logs.

CLASSROOM CLOSE-UP 5.7
Biology Buffet Tables

Ericka Senegar-Mitchell introduced her biology buffet tables several years ago when she had a small grant to purchase supplementary classroom materials. She chose to buy best-selling trade books written by scientists, books to go with various curriculum units—*The Selfish Gene,* by Richard Dawkins, for her evolution unit, or *The Seven Daughters of Eve,* by Bryan Sykes, to extend students' understanding of genetics, for example. "Those fifteen books were the start," Ericka says. "I wanted my students to see science reading as not just the textbook."

Ericka gradually added more books, including reference books, children's science books (a photo book from the UK that "really shows the human body," she marvels), science magazines (*"Popular Science* is, well, really popular"), journals she subscribes to like *American Biology Teacher* and *AAAS Science* ("they may as well know what I'm up to"), and pamphlets and brochures.

About those pamphlets and brochures: "I got the collection 'bug,'" Ericka says. "I comb the city for pamphlets and brochures." She finds them in natural foods stores, a genetic counseling office, and doctors' waiting rooms. Students also gravitate to brochures Ericka collects from the local university's science degree programs or the community college certificate programs. "I could get the same information from the Internet," she explains, "but I try to use local materials, to make it real for students. 'Omigod,' a student will say, picking up a medical brochure stamped with the name of a neighborhood doctor, 'my grandmother goes to this doctor!' Sometimes when they notice the source of a document, they laugh, 'You went *there?!'*

"I want students to be able to apply what they are learning. We had just been studying cellular transport, what the body needs for good nutrition, what it uses for fuel. One of my students was reading through a brochure from a natural foods store propounding a diet to eradicate carbohydrates. 'I don't believe that!' she snorted. 'Why would you eradicate carbs? You need them for cellular respiration.'

"That's my goal for the buffet tables. To get students to pick what interests them and then to be critical consumers. Now I get kids bringing me stuff!"

High school geometry and algebra teacher Teri Ryan, who loves to read about as well as play with numbers, has put together an extra-credit book list for her students. Her list of titles ranges from bestsellers about mathematics and mathematicians to math-related titles that are accessible to the English learners and inexperienced readers in her diverse classes. For example, her geometry students love *Alice's Adventures in Wonderland,* Teri reports. She alerts them to enjoy the many examples of similarity, congruence, and logic that relieve Alice from an afternoon in the doldrums.

Literature Circles and Book Groups

The rationale and processes that apply to "literature circles" in English courses apply to "book groups" in any subject area. College teachers as well as secondary teachers can use book groups for increasing students' choice of reading material, building engagement, and promoting students' independence as readers. As with adult "recreational" book groups, members are expected to meet deadlines and to bring their questions and ideas to the group. In student book groups, members also keep individual metacognitive reading logs.

Some teachers hesitate to try book groups because the logistics can seem intimidating, but as high school teacher Lisa Morehouse discovered, "Literature circles don't have to drive teachers crazy." After two years of teaching an ethnic literature class, Lisa decided to devote the last nine weeks of her course to literature circles. She was encouraged by the experiences other Reading Apprenticeship teachers reported, and a few additional motivators helped her past an initial fear that having four or five different novels being read simultaneously by small groups would be difficult to manage:

- My students' reading levels differed widely (grades 3–11).
- My school lacked class sets of novels for my course.
- I wanted my ninth graders to take more responsibility for their own education.
- I was given a free box of book sets for literature circles!

Because student choice is a key feature of book groups, a major consideration is whether students will feel that they actually have a choice to make. For this reason, teachers work hard to find a selection of books that vary in reading level and have potential appeal for different groups of students.

Teachers can launch students' book selection process by presenting a quick teaser about each book followed by students' hands-on preview of the different choices. Students might use the "book pass" activity described in

Chapter Six and then return to read a few pages from the books that seem most appealing.

In her literature class, Lisa Morehouse asked students to make an initial prediction about the book from its title, read for a few pages, and then respond to a set of questions. Students can use the same process to preview two or three titles before settling on one:

- After reading these pages, what do you think this book will be about?

- Pick a character introduced to you in these pages. Describe this character and what you think of him or her.

- Write at least three questions you have about the book so far.

- What is your first impression of the book?

The expectation is that teachers will have enough copies of popular titles so that all students can read their first- or second-choice book.

In Lisa's class, after students made their book selections and formed their literature circles, she gave each group a calendar on which she had indicated what days they would be able to read their books in class and the final due date. Groups set their own intermediate deadlines, and all group members signed the calendar as if it were a contract.

In Rita Jensen's middle school ELD class, students' sense of responsibility to the group is reflected in a log kept by one eighth-grader whom Rita feels was helped enormously by the social contract she entered into with her peers. Evidence to this effect, from her metacognitve reading log, appears in Classroom Close-Up 5.8.

In addition to checking students' individual metacognitive reading logs, teachers often ask literature circle groups to make connections from their book to essential questions that the whole class has been investigating, create a group book poster, stage a dramatic moment from the text, compare characters across texts they have read, and take part in other group projects in which each member of the group has a clear role and responsibility. Luke Boyd's grade 9 English students put their Facebook skills to work:

> Students in a literature circle each create a Facebook page for a different character in their novel. The project is designed to capture that character's personality in an online profile. Students have to infer how the character would present himself or herself. What kind of music would that person listen to? What books would he or she read? What Facebook groups would that character be interested in?
>
> Then the characters "friend" each other and post messages related to the plot on each other's pages, in language directly from the novel or in plausible words the student puts in the character's mouth. To review students' work, I can go online or have them turn in screen shots.

One note: It is a good idea to put "fictional character _____" or "_____ from (name of novel)" as the name of the page. That way there is no confusion about the purpose of the page. When students complete their novel, the page is taken down.

CLASSROOM CLOSE-UP 5.8
"We Decided to Read Up to Chapter 26"

Valencia is an eighth grader in Rita Jensen's English language development class who might not ordinarily finish an assigned class novel. But because she chose what book to read (*Walk Two Moons,* by Sharon Creech) with a literature circle of her peers, Valencia's commitment as a group member felt important and kept her reading. Although by the end of the book her log becomes a simple plot recitation, she does reach the end, having found in a book she earlier called "really boring" that "the last four chapters were kind of sad."

2–18

Well . . . I'm trying to catch up with my group now. I got left behind because I didn't read on Monday or Thursday. I'm at the same place as them now. So, I'm going to force myself to read up to chapter 26. We decided to read up to there.

I'm starting to think that the book is really boring though. It's not so exciting. I thought that it was going to be really interesting and exciting. Now when I read it, I'm so bored. I don't want to start reading another book though. Think that there is parts that scare me a little bit. The parts what that man keeps leaving messages at Phoebe's front door. If that happened to me I would be so scared. I would immediately tell my mom and she would probably call the police.

2–22

During the three day weekend I didn't really do that much reading . . .

Chapters to Read

2/22 tonight = chapter 19–23

2/23 tomorrow = 24–26

2/24 27–30

2/25 31–34

2/28 35–40

2/29 41–44

2–23

I stayed up until 12:30 or 1 o'clock just reading the book. I started reading at 11 o'clock. My mom kept waking up every 15 or 20 minutes, telling me to get some sleep. I was very comfortable reading last night. I was warm in my bed and there was lots of silence. I understood the story very well and I actually really enjoyed it. There were one or two words I didn't know. I was going to look them up but then I got a little sleepy. I'm surprised that I read everything I was supposed to read.

2–24

I started reading at 9:30 and got done at 10:10 PM. It was a little hard for me to understand what I was reading though. I was reading while I was watching the Grammy Awards. I did try my hardest to consentrate on my book though. I would have turned off the television but I just wouldn't. I really had to watch the awards.

2–25

Chapter 27–30

These chapters are about when Sal . . .

2–28

Last night I didn't really get a chance to read a lot.

2–29

On chapter 32 Sal thought . . .

3–2

The last four chapters were kind of sad.

Independent Projects

As a way to support choice *and* extensive reading, independent as well as group projects are a great boon. Teachers often find that when they shift more of the reading of course materials from at home to in class, independent projects are a good homework option.

In Chris Van Ruiten-Greene's high school English classes, in addition to reading the core curriculum and the horizontal text sets that support and extend the literature classics, Chris's students complete quarterly free-choice books and make presentations about them to the class:

> Everybody has to commit to a choice book once a quarter. Students are choosing their own interest avenue and that's a big deal. They have to present what they have been reading, what is floating their boat personally. They look forward to that.

Projects based on books that students choose and read independently anchor the science curriculum that Janet Creech and Ann Akey designed for their ninth grade science course. Students routinely read the textbook and keep metacognitive logs, but the curriculum also provides two streams of choice: (1) students complete monthly "Science in the News" reports about current science articles they find in print and online newspapers and magazines, and (2) they complete quarterly science book projects about science books they choose from a wide selection (see Box 5.3 for a schematic of the curriculum).

BOX 5.3

Student Choice in a Grade 9 Science Curriculum

Students in Janet Creech's and Ann Akey's grade 9 integrated science classes read required course materials and keep metacognitive logs in class but also work individually on monthly science news reports and quarterly book projects for which *they* choose the texts.[7]

Extensive Reading in Grade 9 Integrated Science Course

	First Quarter		Second Quarter	Third Quarter	Fourth Quarter
Metacognitive Logs	Introduction		Ongoing	Ongoing	Ongoing
Projects			Read an expository science book	Read the biography of a scientist	Read a fiction book with good science
			Write a children's science book	Present a historical vignette	Participate in book club discussions
Science in the News (SiN)		Intro-duction	1 Per Month · 1 Per Month	1 Per Month · 1 Per Month	1 Per Month · 1 Per Month

"Science in the News" involves students in finding news reports in news-papers, magazines, or journals that describe scientific issues or research of interest to them. They work individually to create structured reports about their articles, then discuss them in small groups. In Classroom Close-Up 5.9, Janet describes initial challenges students had with the assignment and how they were resolved. (The assignment itself appears in Box 5.4.)

BOX 5.4

Science in the News Assignment

One way Janet Creech and Ann Akey build student choice into their grade 9 science course is with a monthly "Science in the News" assignment.[9] Students search in newspapers and magazines for science news stories of personal interest, write about the science being reported, and learn how to be knowledgeable consumers of science news.

STUDENT GUIDELINES

1. Find an article about scientific research/observations that was published in a newspaper, magazine, or journal during the assigned month. The article must be at least two hundred words long.

2. Read the article and write down what the scientists were trying to find out (what question were they trying to answer).

3. Underline, in two different colors, the following information (color in the boxes to make a key).

   ☐ The methods the scientists were using (procedure) and the type of data collected.

   ☐ What the scientists found out (results and conclusion).

4. Answer the following questions on a separate piece of paper, and staple it to this page.

5. Staple the article, or a copy of it, to this page.

QUESTIONS

1. (a) Title of the article; (b) Topic of the article; (c) Author(s); (d) Source of article (name of newspaper, magazine, or address/URL and name of Internet site)

2. (a) Write the full name and title (if given) of a person quoted in the article. (If no one is quoted, choose a different article.) (b) Why was this person quoted? What is the person's expertise?

3. How did scientists obtain the evidence on which this article is based? What steps did they follow, what types of tools did they use, and what type of data did they collect?

4. Draw a diagram of the important information explained in this article. Label your drawing with words or descriptions.

5. Write a summary of this article. Your summary must be at least four complete sentences in your own words. Do not use direct quotes from the article.

6. Do some more thinking about this article. Write at least one "on my own" question that you would like to ask the author or the scientists involved.

CLASSROOM CLOSE-UP 5.9

Science in the News Reports

Janet Creech and Ann Akey thought their carefully constructed report format was all their ninth graders would need in order to read and write about science in the news.[8] As they immediately found, however, students required explicit instruction in the process of reading science news and making the reports. Janet explains:

"To help students read, evaluate, and discuss scientific issues and findings that appear in popular media, we developed 'Science in the News' (SiN), a format to help students have an informed scientific perspective.

"We assigned the first SiN as homework, providing guidelines and a structured report format [see Box 5.4]. Looking at student work samples, however, we realized that even with relatively accessible text, such as the daily newspaper, students were not able to read and respond to the science without more help. We had to teach our students *how* to read science in the news.

"I started by finding an article to read and discuss in class. In small groups, students read the article and completed a SiN reading together, discussing *how* they approached highlighting the methods and results and *how* they constructed summaries. Teams shared their results with the whole class while I recorded their reading strategies on an overhead. Later we read anonymous student work samples, evaluating them using our new understandings of how to read SiN.

"With practice, students are able to do the SiN reading activities independently. Teams discuss the science in the reading, instead of how to read the science. Working together, students become expert readers of science in the news. More importantly, we are learning that science literacy is not a fixed object; people are not good readers or nonreaders, but evolving readers."

For the book projects that Janet's and Ann's students complete, their teachers have set parameters for the type of project students undertake each quarter, but book choice belongs to the students. During one quarter, students each become a science topic expert and then use their expertise to write a children's book. Another quarter, projects focus on science biographies, and students make class presentations in the guise of their selected scientist. The last project of the year involves students in literature circles in which group members have chosen the same piece of science-based fiction to read and discuss. Janet explains the three types of projects in Classroom Close-Up 5.10.

Janet and Ann did not expect their students to be able to complete these long-term projects without support and intermediate deadlines. Students had weekly written assignments that included metacognitive and factual notes about what they were learning. The form that students completed appears in Box 5.5.

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CLASSROOM CLOSE-UP 5.10

Quarterly Science Book Projects

Building science literacy is a major goal of Janet Creech and Ann Akey's grade 9 science course, so student choice is a major component. For their quarterly book projects, students have free choice of texts within the broad structure of each project, as Janet describes here.[10]

Read a science book and write a related children's book

"In the fall our classes make a trek to the school library's nonfiction science section. We give students a chart that describes where science topics can be found and let students look for a book that interests them. Once they find one, we negotiate. Because our goals for this project are to build fluency, stamina, and motivation as well as general science knowledge, our focus is helping students find books that genuinely interest them and that are not too difficult. As a result, I start to see science-based library books appearing at sustained silent reading—twenty minutes of reading a day, a school-wide policy—instead of magazines and newspapers.

"During the next four to five weeks, students complete most of their reading outside of class with the support of teacher-generated metacognitive logs designed specifically for nonfiction text. I collect and check these logs weekly to give students written encouragement on their progress. When they finish reading, students demonstrate their understanding of the topic by writing and illustrating a children's science book on the same subject.

"Tapping into students' interests produces some amazing results and encourages student engagement. One English language learner filled her book with photos and descriptions of her own beloved parrots. Another student, who produced little other work during the year, wrote a book about lizards, which he proudly shared. Many students chose their children's book projects (from their *science* class!) to include in their school-wide assessment portfolios as evidence for meeting reading and writing expectations."

Read a scientist's biography and present an interactive historical vignette

"Empowering students with personal knowledge about real scientists and the work they do is our primary goal for the biography project . . .

"When we initially introduced the biography project, we reencountered a familiar problem. We lacked motivating and accessible texts to read. Our library had a scant collection of dusty, unused volumes of 'classics.' Over the next three years, we added biographies of women scientists . . . scientists of color . . . contemporary researchers . . . and the accessible biography series *Great Minds of Science* and *Scientists Who Changed the World.*

"Once we had enough texts involving scientist biographies that students could and would read independently, students could do most of the reading outside of class. We developed new metacognitive log prompts to help students make connections to the influence of culture and society on scientific thought. Once students finish their reading, they write 250-word vignettes about a major event in the scientist's life. They dress like their scientists, bring props representing the scientists' work, and read their vignettes in small groups. The 'scientists' ask their peers in these small groups to discuss opinions about their work and discoveries."

Read a fiction book with good science content and participate in a book club

"This last project elicits raised eyebrows—popular fiction in a science class? When considering what students should read, we uncovered a closely guarded secret: Science people love to read good fiction about science. When reading fiction, we engage with the ideas of science in imaginative and enjoyable ways that we might not when reading for information.

"We wanted students to have access to this experience while providing opportunities for them to evaluate and discuss the scientific ideas they encountered. Our critical reading and discussion goals make the book clubs our most demanding project, which is why we save it for last.

(Continued)

"Book clubs are discussion groups of four to five students who have chosen to read the same book. To facilitate book choice, I bring copies of the books to class for students to look through and talk about. They rank first, second, and third choices on an individual, reading level–appropriate list. I use their choices to arrange book club groups. The book clubs meet twice a week during hundred-minute blocks, plan their own reading schedules, and discuss their books. Each student assembles and decorates a reading journal specifically designed for fiction narrative. New metacognitive log prompts help students make connections to situations or characters in the novel and analyze the science presented in the story.

"Students bring these journals with them to their book club and use them as the basis for group discussions that often lead to new insights about the far-reaching impact of science in their lives. As they contribute to scientific and literary conversations with their peers, students see themselves as successful readers of science."

B O X   5 . 5

Science Book Project Weekly Check-Ins

To support students' independent quarterly project work, Janet Creech and Ann Akey assigned weekly check-ins that helped students stay on track for the project deadline and keep track of their learning.[11]

READING LOG

Name_____   Due Date_____   Total pages in my book ____   Pages read this week: ____ to ____

1. Respond to two of the following metacognitive prompts. Write at least two sentences for each prompt. Try different prompts each week.

   "While I was reading"

I felt confused when . . .	I stopped because . . .
I was distracted by . . .	I lost track of everything except . . .
I started to think about . . .	I figured out that . . .
I got stuck when . . .	I first thought that . . . but then realized that . . .
The time went by quickly because . . .	I finally understood . . .
A word/some words I did not know . . .	I remembered that earlier in the book . . .

2. What was the most interesting fact that you learned this week?

3. Write down two questions that you could ask about this week's reading ("author and me" or "on my own").

4. Write down five scientific terms (terms not commonly used outside of science) from this week's reading. Explain what each one means.

5. Add the five terms from number 4 to the concept map you are keeping. Remember to label all arrows and write in a different color each week.

6. Draw a picture or graphic that shows an important idea from this week's reading. Label your drawing with words or descriptions.

7. Summarize, in a paragraph of at least four detailed sentences, the most important ideas in this week's reading. Explain as if you are talking to a person who has not read your book.

Extending Support and Accountability

When core texts are challenging, sometimes teachers resort to reading aloud from these texts to the class or having students take turns reading aloud, to ensure that students are able to access the material. *Reading for* students sometimes becomes *comprehending for* students, as well, because teachers naturally want to make sure students understand the materials being read to them. Building students' independence as readers and learners means teachers must find ways to engage students in doing the work of reading and comprehending for themselves.

Sometimes this begins with uncoupling students from their dependence on the teacher for understanding task directions. For example, science teachers may ask students to Talk to the Text of their lab instructions and clarify any areas of confusion with their lab partners. The result, teachers report, is not only fewer questions about instructions but better labs. In her history classes, Gayle Cribb realized something similar:

> One day after I had passed out written directions for a task, but students still didn't know what to do, it occurred to me that no one actually had to read the directions if I also explained them. That's when I decided to retrain all of us about the value of reading and understanding directions. Our new routine was for students to read the directions, clarify them with a partner, and then ask the class for help if they still didn't understand.
>
> Students who are less comfortable reading and had simply avoided what they thought of as "unnecessary" reading got important practice in this basic life skill. Students who formerly didn't pay attention to the reading because they knew I would explain began to take more responsibility. I was a little surprised to see, after the first couple of times we practiced this routine, how extremely efficient it was. It became the default practice in all my classes, including in my Spanish classes, where students were reading in their second or third language. It worked!

Support for extended reading that results in a savings in class time—as it can in the case of support for reading directions—is unusual. More often, support for extended reading requires a hard decision about what class time is for. Community college English teacher Missie Meeks found that when she introduced the scaffolds of having students Talk to the Text and keep metacognitive logs, it made a huge improvement in her students' success at writing research papers. But students also needed extra time to read in these metacognitive ways. In Classroom Close-Up 5.11, Missie describes how she decided to give over some of her class time to ensure that students would have the extra reading time they needed.

CLASSROOM CLOSE-UP 5.11
Making Time for What Makes a Difference

In English 1123, students conduct academic research with the goal of producing a final paper that incorporates at least ten sources to support an academic argument. Instructor Missie Meeks identified two problems that were keeping many of her community college students from being successful: particularly difficult texts and the related challenge of paraphrasing them. She hoped to address both by instituting the Talking to the Text routine and metacognitive logs.

"The vast amount of reading in the class comes from the academic literature that students use for their academic research," Missie says. "Many times these articles are written on a much higher level than students are accustomed to reading, and they become frustrated with the entire process and withdraw from the class.

"Even if the students are able to work through the text, many times they still do not have enough understanding of the text to paraphrase it. Plagiarism has always been a major dilemma in English 1123 because students do not comprehend the text well enough to summarize it."

As part of students' grades in the course, Missie made it a requirement that they add a metacognitive dimension to the highlighting they had always done on their research articles. Next to the sentences selected to support their thesis, Missie has asked students to write a metacognitive note so that she and individual students can understand the student's mental process in selecting it. "This activity," she says, "gave me a small window into the mind of the student to see if comprehension was indeed occurring."

Missie also asked students to keep a separate metacognitive log for each source. In these logs, students use the left-hand column to record statements from their reading that support their thesis and the right-hand column to paraphrase the statements. Missie found that the additional metacognitive work students did with their Talking to the Text annotations made it easier for them to comprehend and paraphrase statements supporting their argument.

Although satisfied that the new annotation and log routines were improving students' comprehension and paraphrasing, Missie noticed that the routines created a new problem. "Even though students began to understand the importance of the assignments and became aware of their thought processes, some were reluctant to commit to the time it takes to annotate a text and complete a reading log."

Given the progress students were able to make using their new metacognitive routines, Missie decided to allow more class time for students to annotate their texts and complete reading logs. "I feel that class time to complete this activity is indeed valuable . . . Average-ability students have been able to tackle these texts because the annotating and reading logs have given them tools to work through the text. Many students are no longer fearful of academic sources."

Helping students accept a shift in responsibility for reading is the focus of much of the content of this book. As already described, extending teacher support for reading includes, for example, providing text sets that include easier initial entry points or selecting segments of the text to work on as a class, reciprocal modeling through Think Aloud and Talking to the Text, breaking long passages down into manageable segments, partner and small group work to problem solve, and writing to learn through metacognitive logs and double-entry journals. Such practices, especially as they interact, represent the extended support that students need.

If students are to value this support, they must see course reading as central to the curriculum. Their assignments must signal the importance and value of reading by requiring students to *do* something public with their reading. When students are accountable to each other for their reading and preparation, when they need to read in order to complete an individual project, when they need to rely on one another's reading for joint projects and performances, when teachers collect and respond to reading logs and other evidence of student reading, reading is clearly important in the class and curriculum.

Similarly, to give reading a more prominent place in the curriculum, reading experiences and assignments should contribute to assessments of student learning. Because students have learned to value and give priority to the aspects of their course work that contribute to grades and other recognitions of achievement, reading work needs to count. When students set and reach their academic reading goals by reading course materials, their efforts should be recognized. Metacognitive logs and reflections that accompany course readings should contribute to course grades. In Will Brown's high school chemistry classes, students know exactly how their metacognitive logs (he calls them Reflective Reading Logs) will contribute to their grade. They each receive a rubric that spells it out (see Box 5.6).

A classroom culture that explicitly values reading as part of subject area learning will necessarily incorporate extensive reading. As Janet Creech reports, when she and Ann Akey redesigned their science course, they reevaluated what they wanted for their students:

> Our goals . . . were to improve student's attitudes toward science reading and give students the tools to become lifelong science readers . . . By the end of the school year, reading becomes an established routine in my classroom, and students' attitudes about reading change dramatically. When I announce the first book project in the fall, the general response is "What, we have to read the whole book?" By the time the last project rolls around in late spring, students say, "Read another book? Okay, I can do that."

Janet and Ann have extended time, access, choice, and support and accountability for reading in their science classrooms. Their students reciprocate, extending their reading volume, range, stamina, and engagement. A program of consistent, strategic extensive reading more than earns its keep.

■ ■ ■

BOX 5.6

Making Metacognitive Logs Count

When teachers have large numbers of students, the prospect of grading metacognitive logs is daunting. Experienced Reading Apprenticeship teachers have learned that structuring ways for students to *need* their logs to participate in class is the most important strategy for ensuring that students maintain their logs. Periodically collecting and spot-checking log entries is then usually enough.

Will Brown's high school chemistry students keep double-entry metacognitive logs, and he makes sure they understand what is expected, with his detailed explanation shown here.

REFLECTIVE READING LOGS AND EVALUATION RUBRIC

Throughout the year you will be asked to record notes and reflections from assigned reading using a T-table format. You will be expected to select essential information from each part of the assigned reading including text, figures, equations, and sample problems. You'll record these ideas in the left column of the t-table. With each entry, write the page number in parentheses. You are also expected to think reflectively about the text and relate the essential information to your own experiences, prior knowledge, your personal learning process and questions. You will record your reflections in the right column of the T-table. The template for making your own T-tables is on the back. Reading logs are part of your homework grade. keep all your reading logs in your chemistry binder. They are great study tools.

When I grade reflective reading logs, I look for the presence of a selection of essential ideas in the left column with page references and corresponding thoughtful reflections in the right column. I do not grade grammar or spelling, but you should work hard to make your ideas easy to understand.

I also use the reading logs' reflections as an indicator of topics requiring more in-class clarification.

Reflective reading is a personal activity. We all have unique experiences and thinking processes. So you do not share or borrow reading logs until you have completed your own reading log. In class you will have opportunities to share your thoughts and ask questions recorded in your reading logs.

The following are descriptions of the minimum criteria for each grade.

Nobel Laureate 100%	Research Scientist 90%	Lab Technician 80%	Trainee 40%
Reading log is completed on time. The left column contains plentiful essential information from each section of the text. Correct page numbers accompany each entry.	Reading log is completed on time. The left column contains most essential information from each section of the text. Correct page numbers accompany most entries.	Reading Log is turned in late. The left column contains some essential information from each section of the text. Correct page numbers accompany some entries.	Reading Log is turned in late. The left column contains little essential information from each section of the text. Correct page numbers accompany few or no entries.
The right column contains reflections for each entry that clearly show thoughtful reading.	The right column contains reflections for most entries that show thoughtful reading.	The right column contains reflections for some entries that show thoughtful reading.	The right column contains reflections for few entries that show thoughtful reading.

Upgrades	No Credit = 0%
Students earning *Trainee* on a reading log are invited to redo reading log to meet *Research Scientist* content criteria for an upgrade to *Lab Technician*.	There are three ways to receive no credit. (1) Do not do the reading log. (2) Do not turn in your reading log. (3) Copy another student's reading log entries and turn them in as your own.

Science Literacy Is Empowering

Additional information about extensive reading—specifically a program of free-choice sustained silent reading—appears in Chapter Six; it describes SSR as an important component of an academic literacy course.

Chapter Seven moves on to high-leverage cognitive reading strategies that, in the context of extensive reading and ongoing metacognitive conversation, help students hone their reading problem-solving skills.

Notes

1. This and following excerpts describing Janet Creech and Ann Akey's grade 9 science course are from Creech, J., & Hale, G. (2006, February), Literacy in science: A natural fit, *The Science Teacher,* pp. 22–27. Reprinted/adapted with permission from *The Science Teacher,* a journal for high school science educators published by the National Science Teachers Association (www.nsta.org).

2. Kuhn, M. R., & Stahl, S. A. (2003). Fluency: A review of developmental and remedial practices. *Journal of Educational Psychology, 95*(1), 3–21.

3. Anderson, T. H., & Armbruster, B. B. (1984). Content area textbooks. In R. C. Anderson, J. Osborn, & R. J. Tierney (Eds.), *Learning to read in American schools* (pp. 193–224). Hillsdale, NJ: Erlbaum.

4. Walqui, A., & van Lier, L. (2010). *Scaffolding the academic success of adolescent English language learners: A pedagogy of promise.* San Francisco: WestEd.

5. All excerpts in quotations are from Laurie Erby's description of using Reading Apprenticeship routines as presented on the U.S. Department of Education's "Doing What Works" website: http://dww.ed.gov/Adolescent-Literacy/Engaging-Text-Discussion/see/index.cfm?T_ID=23&P_ID=61&c1=1083&c2=1070#cluster-1

6. These compiled excerpts are from Laura Graff's discussion of her textbook outlining assignment on the Carnegie Foundation for the Advancement of Teaching website *Strengthening Pre-Collegiate Education in Community Colleges*, in the pages "Outlining Mathematics": http://www.cfkeep.org/html/stitch.php?s=14832740290866&id=34947815104339

7. Creech & Hale, Literacy in science (see note 1).

8. Ibid.

9. Ibid.

10. Ibid.

11. Ibid.

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