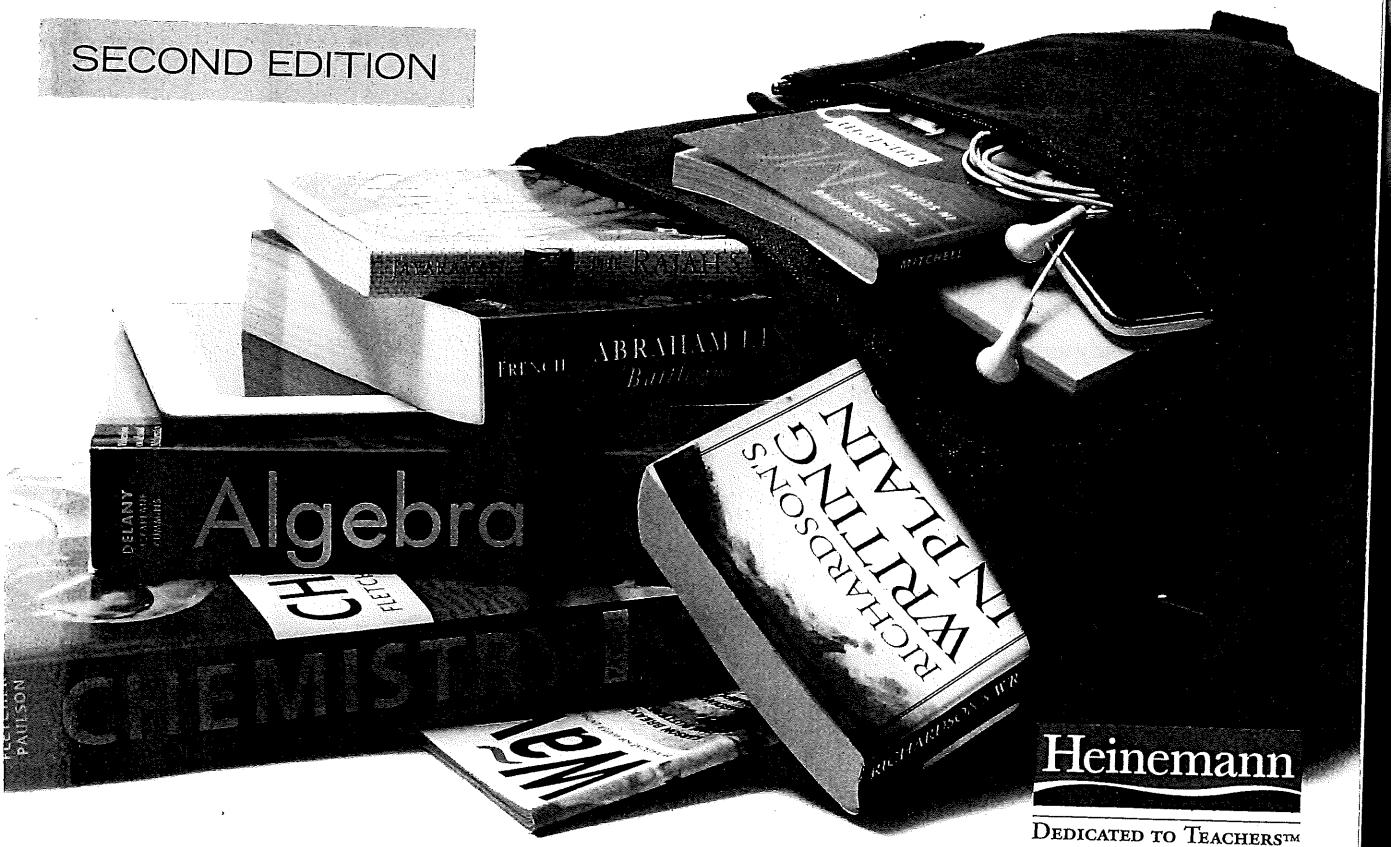
HARVEY "SMOKEY" DANIELS STEVEN ZEMELMAN

SUBJECTS MATTER

Exceeding Standards Through Powerful Content-Area Reading

SECOND EDITION



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Now, don't get us wrong because we are disputing the bad news about reading among America's kids. We are not cheerleaders for the status quo, and we sure aren't happy with the current state of reading instruction. We believe that all of our kids can do better, know more, be more engaged—and we certainly know firsthand that many American schools have a really long way to go. And making reading a more meaningful, more effective, and more profound learning experience is something that we teachers can start tackling today, in our own classrooms—even as we address new standards and prepare our kids for new tests.

Content-Area Reading and the Common Core State Standards

The great majority of U.S. states have committed to implementing the Common Core State Standards (CCSS) and to presenting their students for national tests based on those standards. Other states, like Texas, have developed their own quite similar targets and exams outside the Core. Still others are opting in and out of various aspects of the standards/testing movement to this day. But while this larger school reform movement remains controversial, what is not open to debate is whether such standards will have a big impact on students and teachers: they already have. The CCSS, and state standards like the TEKS in Texas, are already challenging and transforming the work of everyone in schools.

Here's what you need to know if you are a middle or high school teacher of any subject, in any state: *we are all teachers of reading now*. According to the new standards, our students are supposed to:

* read much more
* read more nonfiction (historical, scientific, technical, explanatory, and argumentative text)
* read more closely and thoughtfully
* read increasingly complex and challenging materials
* discuss what they read with peers
* write about their reading

And all of us, not just the English teachers, have to pitch in, according to the Common Core:

> Instruction in reading, writing, speaking, listening, and language are to be a shared responsibility within the school. The grades 6–12 standards are divided into two sections, one for English language arts and the other for history/social studies, science, and technical subjects. This division reflects the

Toward a Balanced Diet of Reading

We've argued that teachers should use textbooks more sparingly, more carefully, and with explicit scaffolding strategies—which we'll detail in Chapters 5 and 6. But the corollary is that young people should be reading content material *in other genres*: newspaper articles, magazines, research reports, websites, primary sources, biographies, and full-length trade nonfiction books. And the Common Core Standards essentially require this. But why? What is to be found in the wider world of reading that students miss when they read only textbooks? Why is it urgent that we change their reading diets? Here is an example of how "real" nonfiction text can be important to the curriculum.

Let's talk about Einstein. A typical physics textbook might give one or two pages to his world-changing equation, $E = mc^2$. So we can say that the concept is "covered," at least for the students who brave a physics class at all. Trouble is, if you go out on Main Street America today and ask a hundred textbook-educated high school graduates what each symbol in the equation means, ninety-nine of them will not be able to tell you. And the knowledge gap does not just afflict nonscience majors like Smokey (Steve studied physics in college—no fair!). Now, if you further inquire of your random citizens, or even those who took that high school physics course, what the equation *means*, most cannot say much at all. Sometimes people, shown the equation, just shrug their shoulders and say "Boom!" This is not what we could properly call "deep understanding."

Physics

The noted science writer David Bodanis was worried about the ignorance of this central fact affecting modern life. "There are plenty of books that try to explain it," he says, "but who can honestly say they understand them?" So Bodanis took a distinctly non-textbook

approach in his book $E = mc^2$: *A Biography of the World's Most Famous Equation*. "Everyone knows that a biography entails stories of the ancestors, childhood, adolescence, and adulthood of your subject," he reasoned. Bodanis takes each symbol in the equation and tells the story of the people who developed the big idea from its infancy. Believe it or not, his book is a page-turner, a stay-up-all-night-and-finish-it yarn. It takes 113 pages, but by the time you've heard all the stories, you feel that the equation, and indeed the theory of relativity itself, has entered your bones forever. How is this different from the textbook treatment? How does Bodanis provide readers both depth of understanding and page-by-page entertainment? Here's what it sounds like.

These are the elements of engagement that you'll find in any successful nonfiction book, in any content area, be it mathematics, science, history, economics, or art.

Toward the end of the book, Bodanis describes a 1938 breakthrough by Lise Meitner, a brilliant Jewish scientist who had been banned from Germany and was exiled to Sweden (2001, 109–111). Her nephew, Robert Frisch, also a physicist, came to visit her at a friend's country home. The two went out in the snow with Frisch on cross-country skis and his aunt marching briskly beside him on foot. Along the way, the two talked about the uranium atom and its peculiar properties. As an idea started to dawn, they slowed down.

> Meitner and her nephew weren't physicists for nothing. They had paper with them, and pencils, and in the cold of the Swedish forest, this Christmas Eve, they took them out and began calculating. What if it turned out that the uranium nucleus was so big, and so crammed with extra neutrons in there, that even before you started artificially pushing extra neutrons in, it was already in a pretty precarious state? That would be as if the uranium were a water droplet that already was stretched apart as far as it could go before bursting. Into that overstuffed nucleus, one more plump neutron was then inserted.
>
> Meitner started to draw the wobbles . . . Frisch took the pencil from her politely and did the sketches. It was like taking a water balloon and squeezing it in the middle. The two ends bulge out. If you're lucky, the rubber of the balloon will hold, and the water won't burst out. But keep on with it. Squeeze in some more, and when the balloon spreads sideways, let go until it rebounds toward the center, then squeeze in the opposite way. Keep on repeating. Eventually the balloon will burst. Get your timing right, and you won't even have to squeeze very hard.

By the time their walk in the snow had ended, Meitner and Frisch had developed a hypothesis that would change the world.

> The atom was open. Everyone had been wrong before. The way in wasn't by blasting harder and harder fragments at it. One woman and her nephew, quiet in the midday snow, had now seen that. You didn't even have to supply the power for a uranium atom to explode. Just get enough extra neutrons in there to start it off. Then it would start jiggling more and more wildly, until the strong forces that held it together gave way, and the electricity inside made the fragments fall apart. This explosion powered itself.

What's the difference between textbook talk and this best-selling trade book? Of course Bodanis, like all good nonfiction writers (including the more skillful textbook authors), uses solid organizational patterns. But he gives much more to make the information readable and memorable:

* content that is important or engaging
* people we can care about
* a narrative structure or chronological line
* places we can visualize
* danger, conflicts, risks, or choices
* value, moral, ethical, or political dimensions
* ideas that reasonable people can debate, dispute, or disagree about

These are the elements of engagement that you'll find in any successful nonfiction book, in any content area, be it mathematics, science, history, economics, or art. In this example, using letters, diaries, conversations, and photographs (but no other formulas or equations), Bodanis brings to life some of the most complex and consequential ideas in scientific—indeed, in human—history.

Now, about this time, any science teacher might interject: "Hey, this $E = mc^2$ stuff may be readable and maybe my kids would enjoy it. But it is 113 pages long, not three! I'll grant you that students might understand the equation better if they read this book. Maybe they'd be more able to think through issues like nuclear energy, radiation, and all that. But I don't have that kind of time! I have scores of mandated topics—and the new standardized test covers everything. What am I supposed to do?"

Fair question. Do we make time for the real book or not? And if so, how? Well, some help comes from the Common Core Standards, even if at first it seems like they ask us to do a lot. Those standards under "Integration of Knowledge and Ideas" that call for students to

analyze ideas in various texts and compare approaches across texts—those thinking tasks can't be carried out on textbooks. The only way to address them is by taking time to *go deeper into a smaller number of topics.* This is exactly what 26 states are officially moving toward as they develop the Next Generation Science Standards—depth versus coverage. All this means yes, we should step outside our content area textbooks for a while—not the entire school year,

FORTY books a year?

Back in the 1990s, it seemed like everyone in the field of education was issuing a "standards report." One we admired in many ways was issued by the New Standards Project. Headed by Linda Darling-Hammond and funded by the National Commission on Education and the Economy, the NSP among other things made this declaration as their number one educational standard: all students in American schools should read at least twenty-five books per year. Huh? In middle and high school, we can never accomplish this with just one textbook for each of five or six courses! I mean, if you hang on to the regular textbook in every class, that gives you only five or six—plus students would have spent a huge amount of time on this handful of tough, thousand-page books. Then what? Where do the other books come in? Maybe a couple of novels in English, but . . .

Now, however, a surprising number of teachers have gone even further and adopted Donalyn Miller's forty-book challenge (in *The Book Whisperer*, 2009). Donalyn does not simply post a number on the wall, however. She supports students in reaching that goal—carving out in-class reading time, providing reading role models and access to books, supporting students' reading choices, streamlining work where she can. OK, you might not tackle the whole job in your math classes. But what if teachers organized to do this across the subject areas in your building? Maybe this forty books a year standard is a little *too* radical for most would-be school reformers, and a little too threatening to the textbook publishers, with their stranglehold on instructional materials budgets. But do a Web search for the forty-book challenge and you'll see that maybe it's catching on anyway!

but a while—and have students read $E = mc^2$, or *Material World*, or *The Joy of Pi*, or *No Easy Day: The Firsthand Account of the Mission That Killed Osama Bin Laden*, or *Genome*, or *Letters to a Young Scientist*, or *Postville*, or *The Relentless Revolution: The History of Capitalism*.

Now, while we noted in Chapter 3 that newer textbooks have incorporated "big ideas" for their chapters to promote deeper thinking, these are often just labels covering the same overstuffed and authoritative but sketchy summaries of material. And though the best of the textbooks do provide online links to additional articles, it's challenging for a teacher to make time to use them—and the publishers don't always keep them updated.

It is hard to make yourself put that textbook down and "teach less," giving up so much time for one book, covering just one big idea. One way to do this is to identify a few key concepts and link all of your teaching to these across the year, rather than lightly covering an endless list of facts and factoids. Our friends in the history department at Deerfield High School have made this possible by focusing on a set of overarching themes for each course. For U.S. history the list looks like this:

History

* what it means to be an American
* the individual and the state
* the role and evolution of the rule of law
* popular sovereignty and states' rights
* reform/resistance
* sectionalism and sectional conflict
* war and its impact on soldiers and the civilian population
* isolation, intervention, and engagement in world affairs
* executive power in a time of crisis
* the challenges of diversity and conformity (assimilation)
* race and American society
* gender and American society
* the movement from a predominantly rural to a predominantly urban society
* the role of markets and government in the economy

At Clissold School, on the far South Side in Chicago, the junior high grades use the International Baccalaureate Middle Grades program, in which the curriculum is infused in all subjects with the following principles:

* three fundamental concepts: holistic learning, intercultural awareness, communication

* five areas of interaction: approaches to learning, community and service, environments, health and social education, human ingenuity (though we understand that these are being changed as we speak)
* seven approaches to learning skills: communication, collaboration, information literacy, organization, reflection, thinking, transfer
* ten learner profiles: balanced, caring, communicator, inquirer, knowledgeable, open-minded, principled, reflective, risk taker, thinker

In Debra Henderson's seventh-grade humanities class, for example, you'll see her students working in collaborative groups, each exploring the culture in a specific country. Once their research is done, the students reorganize in "jigsawed" groups to compare information about the various countries, and finally circulate around the room to place sticky-note comments on each other's country posters. It won't be difficult for the reader to identify the many IB principles addressed in this activity. And Debra makes sure students are reminded about the connections regularly, to understand what's behind their learning.

A simpler strategy can just be to pause frequently from the usual curriculum to explore a short, relevant article and think through the implications together. A great resource for this is Smokey and Nancy Steineke's *Texts and Lessons for Content-Area Reading* (2011). And we'll have more to say about short readings just ahead.

A Balance of What?

If textbooks aren't enough, then exactly what must be added to achieve a balance? What else should kids, adolescents, teenagers be reading? What range of genres, styles, length of texts, and so forth are we looking for? One way to answer this question is to notice what the thoughtful, curious members of the surrounding adult community are reading. Among your local lifelong learners, what's in the literacy diet? Probably you'd find that these thinking grown-ups read from a wide range of genres, in assorted situations and for various purposes. They probably read some "required" material for work, some other texts to stay informed as citizens and consumers, still more materials to get practical information, and some stuff just for fun. And that's just how we should work it in school for kids, creating a balance along a number of continua, including the following.

Textbooks versus other genres

Here's a list of some text genres that exist in our culture, roughly arranged from the most dryly factual to the most "made up."

- Reference books
- Textbooks
- Manuals/instructions
- Contracts/legal documents
- News stories
- Feature stories
- Historical accounts
- Profiles
- Editorials
- Essays
- Reviews
- Biographies
- Narrated nonfiction
- Memoirs
- Travelogues/adventure
- Historical novels
- Novels
- Plays
- Poetry

You might debate these classifications, but we'd still argue that a well-educated middle or high school student should be regularly sampling many genres. And we can't think of a single school subject that doesn't have its own published materials in many of these slots. There are memoirs of historical figures, biographies of mathematicians, profiles of artists, reviews of literature, reference books on artists—heck, we could probably even find a contract with a scientist (a patent, for example, or a government grant contract).

Most of these genres are familiar. Perhaps the only unusual term is "narrated nonfiction," which refers to informational texts where content is delivered through a personal voice like this: "Imagine standing at the edge of an ice field, looking up at your first glacier." It's a trusty tool of magazine writers everywhere: "Beyonce sits at a back table in Starbucks, absently stirring her coffee and talking about her charity work. She looks much more fragile and thoughtful than the swaggering sex object in her videos." You know the drill.

Choice versus assigned

Usually, all school reading is assigned by a teacher. But real readers, lifelong readers, assign themselves. Sure, they may have jobs that provide some "required" reading. But in their wider lives, deciding what to read is a definitive act of literacy. Will it be the *New York Times* or the *Chicago Tribune*? *Vanity Fair* or *Wired*? A novel or a biography?

It should be just the same for adolescent students in school. In every subject area, some reading materials should be chosen by the young people themselves, reflecting their own view

of the topic, their own connections and interests. Of course, students will need practice and guidance in choosing books, articles, and Internet resources—after all, they may have experienced nothing but dependence in school. So we'll help with a gentle hand, keeping in mind that giving kids choices is not a matter of "letting" them decide a few things: on the contrary, the flip side of choice is responsibility. When we invite students to find valuable reading materials for themselves, we are "requiring" them to do the jobs real readers do. We're refusing to spoon-feed every piece of text they need to understand the Civil War. We're also saying, "You cannot choose to read nothing," and forthrightly enforcing that rule. With choice, students shoulder some work—but we'll explicitly show them how. The Common Core Standards focus heavily on building students' independence as readers. Choice is an essential part of that.

History

For his U.S. history course, Ken Kramer has students read interviews from *The Studs Terkel Reader: My American Century*, using in-class reading time about once every two weeks. Sometimes he assigns a passage for everyone to discuss. But often, students make their own choice of an interview to read within a particular section. Using a single book of short pieces obviates the challenge of constantly photocopying materials, which is an issue across the school. Ken finds, too, that readings like this are essential for achieving the engagement and depth that the history text lacks.

Fiction versus nonfiction

In the content areas (English being the supposedly "content-free" exception) we are mostly concerned with a more balanced diet of nonfiction, and especially a wider range of genres. This is a realistic adjustment in many ways: after all, 84 percent of what American adults actually read is nonfiction. And the Common Core Standards call for a strong diet of nonfiction in students' reading. For some, this has been quite controversial, as English teachers fear losing their most cherished novels and plays. But much nonfiction reading can naturally take place in content-area courses, as the standards documents assert.

However, there are times when fiction also has a very special place in science, math, history, and other fields. Students might grow interested in a deadly historical quarrel like the Hamilton-Burr duel. What was it actually about? Well, *Burr* by Gore Vidal is one of a thousand historical novels that includes tons of factual background information, and makes both a person and a period come alive. Lawrence Hill's award-winning *Someone Knows My Name* traces the journey of a young African woman who is kidnapped and made a slave in nineteenth-century South Carolina, but escapes to make her way back home. And for a page-turner about the development of the atomic bomb, including personal peccadilloes of Robert

History

Oppenheimer and his band of ego-driven physicists at Los Alamos, you can't top *Stallions' Gate* by best-selling novelist Martin Cruz Smith. But we don't always need to match novels with a course topic; we can also use fiction simply to set the stage, to entice curiosity. If you're a science teacher trying to prime students for a unit on time, space, or astronomy, an Arthur C. Clarke short story could provide a great sci-fi blastoff.

English class is where kids get their official doses of fiction and poetry. But perhaps in light of the Common Core recognition of the importance of nonfiction reading, we should rebalance the diet a bit here, too. After all, some of today's most celebrated, cutting-edge writing is nonfiction appearing in progressive magazines and edgy websites. And the hot book-length genre for a number of years has been memoir—dare we suggest a little Dave Eggers in place of Jonathan Edwards?

Classics versus contemporary works

There are always steamy debates about whether kids should read "classic" works or dig into contemporary young adult literature instead—and the Common Core Standards have only intensified the discussion. In this endless and tiresome controversy, authoritative prescriptions abound. Unfortunately, the Common Core exemplar texts are surprisingly skewed. Not one African American novelist or dramatist for freshman or sophomore English? Nothing for history/social studies reflecting contemporary urban poverty, or Americans' experience with war in the twentieth century? And though the lists are only offered as "examples," some schools have simply adopted them uncritically.

Some of what kids read in school should hold up a mirror to them by including their story, their culture, their experience.

So for an appropriate and balanced reading experience for contemporary American teenagers, we are big subscribers to the "windows and mirrors" theory of book selection. Some of what kids read in school should hold up a mirror to them by including their story, their culture, their experience. This is a way of saying, you and your family are important, you are part of us, part of our country and culture. But other books should act as windows, where kids look out not at their own reflection, but upon other peoples, other time periods, other stories, values, and ways of life.

We sure don't see many mirrors in the Common Core recommendations, especially for the African American and Hispanic and, come to think of it, the white students we teach. Once again, it's all about balance. To bind young people to school and to reading, we need to invite them in, make them welcome, honor their heritage, and address their current interests. Fortunately, the Common Core lists are just recommendations, and schools and

districts can develop more-inclusive reading options. Of course, as educators we know we also need to stretch our students, to broaden their knowledge, enrich their experience, widen their worldview, and grow their fund of information. Yes, contemporary kids can identify deeply with protagonists in way-back times and far-off places. Look at Harry Potter and Bilbo Baggins. But if the school mainly assigns distant, alien, and anachronistic books, you are pushing many kids away. You are saying, in effect and not by accident, "Hey buddy, this ain't your place." And as revealed by recent research, students' success is heavily affected by whether they see school as a place where they belong.

Hard versus easy

While some reading should be challenging, students can learn plenty of content (and as research shows, actually increase their reading ability) when the text itself doesn't constantly trip them up. Too many students (some labeled "special ed" and others not) spend their entire school day staring at text they *cannot read*—and many times it's a textbook. Now if a student spends six hours a day not being able to read what we put in front of him, what is the most likely consequence? That the kid rededicates himself to reading and school? Or that he feels kicked out of a club he doesn't want to join anyway?

. . . kids need to read stuff they can read. This is nonnegotiable.

We'll say it loud and clear, and research strongly supports us: kids need to read stuff they *can* read. This is nonnegotiable. Some time during every school day, students should read comfortable, fun, interesting text they can zoom through fluently without hesitation. If this means bringing third-grade materials into a ninth-grade room, fine.

If you are worried about pandering or underchallenging, think about it this way. Scratch a lifelong reader, someone who has grown up to be a sophisticated consumer of text, and you'll almost always find some Nancy Drew, Hardy Boys, or even—yikes!—comic books in their background. Maybe this even describes us. But like most grown-ups, we tend to forget parts of our own history, like the fact that young readers often grow by reading lots of really easy, sometimes formulaic materials. So have faith. If we spend part of every school day helping kids enjoy some reading, whether inside our content areas or out, we are giving a great and lasting gift. As Richard Allington's extensive review of research shows (*What Really Matters for Struggling Readers*, 2011), lots of easy reading builds the stamina that moves kids forward.

The Common Core Standards, meanwhile, argue intensely for moving students to more complex texts, and we know that to do well when they go off to college, young people will need to be able to handle these. The question, though, is how to help them get there—and

simply plunging them into the deep water without any life preserver doesn't accomplish that at all. Instead, when our students are tackling more challenging materials, it's our job to provide the supports, the "scaffolding," as reading experts call it, that helps them navigate—finding engaging topics, building academic vocabulary, developing background knowledge, providing comprehension strategies, promoting lots of discussion.

Prosser High School in Chicago serves a largely Mexican American student body, and Prosser biology teacher Marnie Ware knows that difficult technical words make her second language learners feel excluded from the "learning club." So she helps them learn prefixes and suffixes that make the language more recognizable. She uses call and response for biology vocabulary to familiarize the kids with it. And she discusses the cultural issues that scientific language can bring up—perhaps inadvertently. She discusses the social justice connections in biology, including the location of polluting industry in their neighborhoods and global and local food availability. "People who don't know about these things get taken advantage of," she reminds them.

Biology

In his Deerfield High School U.S. history class, Ken Kramer helps students comprehend and appreciate historic documents by reading them aloud. He finds this brings older writing styles and challenging vocabulary to life, and students actually get better at reading such documents as a result. Reading aloud is not just entertainment, but a scaffold to stronger comprehension of subject matter Ken is teaching. For more on reading aloud, see our fuller treatment on pages 98–99.

History

Short versus long

Kids' school experience already features plenty of *long* selections, as evidenced by the subject-matter textbooks and novels we typically assign. But among real readers, a lot of important information comes from short clips, articles, reports, web pages, charts, tables, and pamphlets, too. The Common Core also recognizes the value of short texts, emphasizing the close reading of selected *excerpts* and *passages*. Whatever our teaching field, we need to build a collection of these small-is-beautiful reads. That means scouring newspapers, magazines, and websites, realizing that every school subject gets "covered" in the popular press, if we know where to look. Then we can feed class discussions with articles about air pollution in the community, the role of serotonin in brain function, the latest genetic engineering breakthrough, racial quotas in police department hiring, or a controversial art exhibit.

The Internet can really help you build this kind of collection. Obviously, if you have a hot topic at hand, you can start by Googling it or checking Google News for many articles to choose from. Most major city newspapers now have free electronic editions, with

printer-friendly articles ready to be used in class two minutes from now. Many teachers we work with prefer www.nytimes.com for this service, giving kids access to "America's newspaper of record." Some also use the well-designed, mostly higher-order discussion questions that accompany articles on the *Times* educational website, "The Learning Network" (http://learning.blogs.nytimes.com/). You may prefer your home-town newspaper for local news—including events that kids can experience or investigate firsthand.

We asked middle school literacy coach Mindi Rench to share her favorite Web strategies for finding articles on content-area topics, with an eye to saving time for busy teachers. She especially likes the Learning Network because it provides links to articles by topic. She explains, however, that "Twitter is actually the place where I find most of the material I send to the content teachers in my building." She finds that if she puts out a request for reading on a specific topic she usually gets responses in half an hour. The Twitter discussion #edchat is very useful. And she uses an app, Tweetdeck, to follow specific chats.

Short articles allow for a quick in-class read and immediate discussion that leaves no one out.

The Library of Congress website www.loc.gov/teachers/classroommaterials/lessons/ enables people to search for writings by topic. The site http://longreads.com allows searches of many of the standard circulation magazines, and even reports the length of each piece. Last on Mindi's list of favorites is Pinterest, where many teachers post collections of articles by topic.

Building a collection of short articles about your subject is helpful in many ways. To begin with, you'll want to use subject-related short selections when you teach students the specific reading strategies outlined in Chapters 5. Obviously, your newfound inventory of "shorties" allows you to dip your toe into the water and step away from the textbook for brief experiments. You can add some "real" reading to the subject without committing large chunks of class time, and see how you like it. Short articles allow for a quick in-class read and immediate discussion that leaves no one out. This can bring reluctant readers (or kids who haven't done the homework) into the conversation. One warning, though: we've seen materials that are so boiled down and dumbed down that they hardly say anything at all. We just need to be judicious about the pieces we choose.

At Prosser High School in Chicago, the teachers decided to increase students' reading by scheduling ten minutes of sustained silent reading (SSR) once a week in the classrooms of all key subjects—English, social studies, science, math, and foreign languages. The reading in each subject occurs on a separate day of the week, so that some reading outside textbooks occurs *every day*. To share the searching, the math and science departments have set up

hanging files to store articles that teachers dig up. The teachers use SSR in a variety of ways. Biology teacher Marnie Ware likes to introduce articles that express differing points of view, such as pro and con positions on the use of genetically modified foods. Many of the teachers have students write brief exit slips on their reading to maintain accountability. At first kids groaned about the reading, and some students wondered, "Why are we doing this reading when it's math class?" But then they found it was highly interesting and would help prepare them for the reading on standardized tests. And as English teacher Molly Rankin remarks, "There's something liberating about having the students do the work, instead of us."

Social Studies

Readings in Ken Kramer's Issues in Modern America course, an elective for Deerfield High School seniors, consist entirely of short contemporary news articles and informative pieces on the Web, organized around topical units. Some of the topics, such as high school hazing, student free speech, and student privacy, are especially relevant for the kids. Others are larger national issues such as affirmative action or wrongful crime convictions. Students read and then blog about these topics, and comment on each other's blogs to extend the conversation. Naturally, we asked whether collecting and updating the readings consumed large amounts of Ken's time; but he insists that simply reading the newspaper every day gives him plenty of material to choose from. Linking back to our discussion of chosen versus assigned readings, Ken explained that during the final four weeks of the year, students in the course study an issue of their own choice, finding readings (often on the Web, of course) and creating displays that present both sides of the issue. For a social studies fair, students conduct a "Marketplace of Ideas," standing by their displays to explain their issue to student and adult visitors—and expounding on their own point of view, as we would expect. One lovely consequence: students report that they often discuss the issues over the dinner table at home and with friends at lunch. Just how often do we think high schoolers launch into passionate dinner table conversation about textbook sections, dates, and facts they are supposed to memorize?

"There's something liberating about having the students do the work, instead of us."
—Molly Rankin

Math

"But what about sources for short real-world readings in a subject like math?" you may ask. OK, we accept the challenge. For a start, we suggest taking a look at *A Mathematician Plays the Stock Market*, by John Paulos. Or visit Guarav Tiwari's December 27, 2011, blog post that lists interesting articles about math (at http://gauravtiwari.org/2011/12/27/imrp/). Many are quite accessible for high school students. Or visit the "Easy Calculation" website (at http://easycalculation.com/funny/funny.php) for fascinating math facts and tricks. And for articles on statistics and data, subscribe to *Chance* magazine in hard copy or online.

Primary versus secondary sources

Many school textbooks are "secondary" sources, which means their content has been gathered from other materials (too often other textbooks), and then combined, reshaped, interpreted, and served up by the authors. Sometimes these texts are published as anthologies, where the original source of each section is cited directly in the text; more often, information is simply delivered with assorted sources combined and no way to tell where specific information came from.

Further, suffusing any textbook, however obscured by their mostly faceless presentational style, is the authors' underlying subjectivity. There is no such thing as "just the facts." Consciously or not, willfully or not, secondary-source authors infuse the books they create with their publishers' required attitudes, views, and cultural stances. Often this means that important but "controversial" information is simply left out. This doesn't mean there is anything wrong with secondary sources. We all depend on them daily, from the spell-checkers on our computers to the "pill book" we consult to see which of our prescriptions might be interacting. Nevertheless, the implicit assumptions are rarely made obvious for the student readers. At least the newer textbooks in areas like biology are up front about the authors' specific attitudes toward environmental protection, the core role of evolution, and other topics that have social implications.

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Primary sources are something else; they are the "raw material" of knowledge. Though we most easily see the importance of primary source materials in the humanities, especially history, they can be just as valuable in science and mathematics. Think of looking at the actual lab notes from a famous experiment, or reading the journal of a path-finding mathematician. Whatever the subject, when students go back to these uninterpreted materials they have a rare chance to really construct knowledge, build theories, develop conclusions, and see how great investigators did these things. Working with primary sources puts kids more in the role of a real scholar or scientist, "doing" the subject, not just hearing the summaries and conclusions of intermediaries.

The University of California Library provides this list of key primary sources, many of which can be gathered and put to use in your classes:

* diaries, journals, speeches, interviews, letters, memos, manuscripts, and other papers by participants or observers
* memoirs and autobiographies
* records of, or information collected by, government agencies

comparisons and integration by making these the focus of Anchor Standard 9. Is global warming a real threat or does it just represent normal variations in the temperature of the earth's atmosphere? Does evolution proceed through its own complex mechanisms or by a higher design? Has racial discrimination been eliminated from American society or does it still affect large numbers of people and institutions? How reliable are the statistics about various social attitudes in this country? Which is the most relevant of Shakespeare's tragedies to today's society and why? None of these questions can be intelligently addressed unless we consult multiple authorities. It is especially useful to gradually create sets of pieces that take different angles on the same topic.

Even when one point of view appears to students to be the correct one, it's important for them to understand and respond to the counterarguments, as the Common Core writing standard for argument recognizes. Getting both sides (or the many sides) of the story is an adult-life skill that cannot be learned and practiced too early. Obviously the DBQ materials we've mentioned enable history teachers to access ready-made collections of documents for students to compare points of view about major historical events. And in Ken Kramer's "Marketplace of Ideas" projects, students are required to find and include materials that present both sides of an issue. Even though the students themselves usually advocate for one position, they come to realize that they must also provide answers to the arguments of the opposing side.

History

History teacher Bryan McKay ramps this up with an activity he calls "speed dating with articles." He lines up short readings in pairs, with each pair presenting two sides of a question or issue. The students then form two lines, one on each side of the pairs. Students quickly read the article in front of them, discuss or debate with the student opposite, and when he calls time, the lines rotate in opposite directions so that every student has a new article and a new partner, to repeat the read-and-discuss process. Do adolescents enjoy this social/academic reading event? You bet.

Building a Classroom Library

The outward manifestation of our break with the one-textbook curriculum is the classroom library, a growing assortment of interesting reading materials collected and offered to our students. What we are trying to create is something like the living room of a big, eclectically literate family, a place where all manner of books, magazines, clippings, articles, brochures, and newspapers surround us, along with a laptop computer where the browser bookmarks websites with interesting reading. Some material will pertain directly to the subject at hand (algebra, history,

etc.) while other parts of the collection can be deliciously random, chosen merely because they interest some teenagers.

So where do you get all this stuff? First of all: take your time and don't spend lots of your own money. A good start is to go through old magazines, save newspaper articles, and search some of the key websites and Web tools on the Internet that we've described. Hearing this, you may want to smack your forehead, thinking of all the years you've thrown away all those magazines, AKA valuable teaching materials. Well, don't grieve—it's all archived on Internet sites now. And trust us, you can get kids going with even a small number of items. Later on, you'll be glad you got started when you did.

Getting both sides (or the many sides) of the story is an adult-life skill that cannot be learned and practiced too early.

If your school or department has a budget line for supplementary materials—and even in lean times it's surprising what funds can be lurking in the corners—you'd better claim the money before we do. For the rest of us, it's beg, borrow, steal, or write grant proposals—not necessarily an arduous or unpleasant process. Scholastic book club gives the teacher points for everything kids order, which you can then use to build your classroom library. In one school we've worked with, kids donate the books they've finished (along with their name on the inside of the cover and a review to guide future readers). Some of our teacher buddies give a tear-jerking appeal for cast-off books and magazines at every fall parents' night, and kids schlep them in for days afterward.

Now, before you start placing an order, spending hours on the Web, or rummaging around your basement, here are a couple of quick considerations about *what* to get. No matter what grade your classes may officially represent, almost any group of students includes a very wide range of reading levels. So you'll need to find not just books for different interests but for different difficulty levels as well. While many high school kids can simply read adult trade books (David Bodanis' $E = mc^2$ is written at a much easier reading level than a science textbook), we also need plenty of books that are just right for younger middle schoolers, for kids who struggle with reading generally, or for anybody who's just seeking an informative "easy read."

Starting at the easier, general-interest end of the spectrum are many nonfiction collections that feature shorter, engaging pieces. The National Geographic's *Reading Expeditions* is a set of 177 colorful, engaging forty-page booklets on science and social studies topics; among the most discussable titles are *Feeding the World*, *The Human Machine*, *The Great Migration*, and *Kids Care for the Earth*. DK Books offers a huge line of gorgeously illustrated, browse-worthy nonfiction books that are updated or recently published, on fascinating topics including architecture, cavemen, government, crime scenes, dinosaurs, religions, fishing, and Batman.

KEY ingredients of a classroom library

1. Interesting trade books, histories, and biographies of people in your field—and if you collect some titles in sets of three to five copies each, students can read and discuss them in groups.
2. Current articles clipped from magazines and newspapers or printed out from their online versions. For example, a recent story covered the growth of Burmese pythons in the Florida Everglades and how they are wiping out the populations of all the small animals—a typical example of the problems that occur when alien species invade an ecological system.
3. General-interest magazines like *Time*, *Scientific American*, *Harper's*, *The Atlantic*, *Wired*, *Utne Reader*, *Popular Science*, and *Popular Mechanics*, which carry stories about many of the topics covered in secondary schools—either in hard copy or bookmarked on tablets or laptops. Magazines on any hobbies the teacher has should be included also—photography, travel, fishing, whatever. Don't forget the "easy reading" dictum; this means celebrity, fashion, sports, gamer, motorcycle, car, and punk rock magazines should all be welcome. We know, we know; just lower your standards and bring it all in.
4. Educational magazines on school topics, like *ChemMatters*, *Science News*, *Discover* magazine, *Chance* magazine (on statistics), *America's Civil War*, and *American History*, are all available in both print and online versions. And go to www.historynet.com for a list of another dozen magazines focused on particular historical periods or events.
5. Website lists, like those on Pinterest, that you've bookmarked on your classroom computers and keyed to various major topics in your course. Some additional examples in one field, physics: topical pages within the *ScienceNews* website (for instance, at www.sciencenews.org/view/interest/id/2366/topic/Matter_+_Energy) cover a wide variety of recent physics-related developments. At www.aip.org/history/acap/ you'll find links to biographies of contemporary physicists and their experiments. Math teachers can find excellent news articles at *+Plus Magazine* on the web (http://plus.maths.org/content/) and instructions for making and learning about a wide variety of fascinating polyhedra at www.georgehart.com/virtual-polyhedra/vp.html.

Still shorter pieces than the book sets are found in the book-length collections of very short nonfiction. If you can get past its unfortunate name, seek out the *Uncle John's Bathroom Reader* series, which provides hundreds of one-paragraph to three-page pieces on a wide array of fascinating topics: Why does popcorn pop? Who planned the White House? Where did the Miss America pageant come from? Why do wintergreen Life Savers make sparks when you bite them in the dark? Was Henry Ford really an anti-Semite? The *Uncle John* series is now up to at least the twenty-third version, plus numerous special-topics editions, all of which ought to sit right beside the encyclopedias in every middle-school classroom. While there is now an online sampler at www.bathroomreader.com, one great advantage of hard copy is that the puzzling questions and concise answers are right there to pique a reluctant student's interest.

The annual *Guinness World Records* books deserve a place in every classroom. Many listings, from world-changing events to goofy stunts, are filled with math and science content—after all, every record requires some measurement. The annual editions of *The World Almanac* and *Ripley's Believe It or Not* feed the same curiosity about numbers and statistics. In a more applied-technology vein, our colleague Dagny Bloland says that among the most popular books in her eighth-grade gifted classroom are the *Chilton's Auto Repair Manuals* collected from gas stations and other donors. While you can choose among these based on your content area, be sure to include plenty of variety so you have more chances to hook reluctant readers with something that grabs their attention.

More grown-up in content and reading level (which we know the Common Core Standards aim to have students reach) is the collection *ShortTakes*, edited by Judith Kitchen, which includes fine writers reflecting on assorted topics: parents, childhood, sports, weather, war, solitude, nature, loss—and, of course, love. A collection of longer pieces, *The Best American Magazine Writing*, comes out annually. Readers love the *2012 Best American Science Writing*, with pieces about advances in organ transplants, understanding the teenage brain, our increasingly violent weather, and the realization that there are more planets circling the stars in our galaxy than grains of sand on earth. Dave Eggers, author of the best-selling memoir *A Heartbreaking Work of Staggering Genius*, assembles a collection every year called *The Best American Nonrequired Reading*, with short and often funny pieces skillfully addressing a youthful audience.

Online sources

Then there's the endless and growing range of resources on the Internet. We've mentioned a number of tools and websites already. But here are some specific Web sources for interesting articles on science and math:

Science

Math

* Science News for Students at student.societyforscience.org/sciencenews-students
* Science Daily at www.sciencedaily.com/

- Girls Angle: A Math Club for Girls at www.girlsangle.org/index.html

* *Math in the Media* at www.ams.org/news/math-in-the-media/math-in-the-media (some articles easier to read than others)

Also on the Web, lots of teachers use Pinterest to share their collections of valuable books and resources. A couple of our favorites:

* a collection of recommendations for historical fiction, at http://pinterest.com/librarianarnold/historical-fiction
* a list of books about math, at various grade levels, at http://pinterest.com/carlahab/math-books
* various teachers' suggestions of books for boys, at http://pinterest.com/mrsorman/books-for-boys/

Book-length nonfiction

Science

Math

For book-length reading, Rebecca Allen in the journal *Teacher Librarian* (February 2013) provides an excellent annotated list of books on topics that will fascinate older students in science and math classes. Typical from her list are Steven Pinker's *How the Mind Works*; *Spillover: Animal Infections and the Next Human Pandemic*, by David Quammen; *The Joy of Pi*, by David Blatner; *How to Survive a Robot Uprising: Tips on Defending Yourself Against the Coming Rebellion*, by Daniel Wilson; and the Climate Central group's *Global Weirdness: Severe Storms, Deadly Heat Waves, Relentless Drought, Rising Seas and the Weather of the Future*. What adolescent could resist? And what teacher would want to stop them?

Great Books for Middle and High School Content-Area Reading

Check out our annotated bibliographies of genuine interesting, content-area-related books on Pintere

Twenty Great Trade Books
http://bit.ly/20TradeBooks

Great Current Issue Books
http://bit.ly/CurrentIssueBooks

Great Science & Technology Books
http://bit.ly/TechandSciBooks

Great Mathematics Books
http://bit.ly/GreatMathBooks

Great History Books
http://bit.ly/HistoryBooks

Great Novels
http://bit.ly/GreatNovels

Great Biography/Memoir
http://bit.ly/BiographyMemoir

Great Personal Growth Books
http://bit.ly/PersonalGrowthBooks

Great Adventure/Sports Books
http://bit.ly/SportsAdventureBooks

As young readers grow stronger, the whole world of adult nonfiction opens up. Some of our partner schools in Chicago have used selections from *Remembering Slavery* by Ira Berlin, Marc Favreau, and Steven Miller, a compilation of interviews from former slaves. The autobiographical accounts, which were transcribed by the Federal Writers Project in the 1930s, provide first-person testimony, sometimes harrowing, sometimes puzzling, from the era of American slavery. The students we work with have also had lively conversations about *There Are No Children Here* by Alex Kotlowitz, the all-too-real account of two brothers growing up in a Chicago housing project. *The Big Test* by Nicholas Lemann gives kids a chance to learn about the peculiar origins of the standardized tests they increasingly face. Dava Sobel's books *Longitude* and *Galileo's Daughter* both dramatically recount world-changing inventions. Jared Diamond's *Guns, Germs, and Steel* offers a chilling and persuasive theory of Caucasians domination.

Other favorites for both history and science classes are two books by Charles Mann, *1491* and *1493*. The first is a groundbreaking study of the different civilizations in North America before Columbus. Its main finding: the peoples and cultures of the continent were far more complex, accomplished, and remarkable than previous accounts had allowed for. A few years later, Mann followed up with *1493*, outlining what he calls "the most momentous biological event since the death of the dinosaurs." Turns out that the eastern and western hemispheres had been almost completely isolated biologically—and when the Europeans arrived, they brought completely novel plants, animals, and bacteria to the ecosystem. Some of those organisms decimated the native populations, facilitating their conquest, while others added to the biodiversity of the Americas.

Science

History

Don't forget novels

So far we've listed mainly nonfiction, but options for novels should be available as well. There are tons of historical novels aimed at younger readers, and there's no better core for a thematic unit than a book like *Morning Girl* (on exploration and conquest) or *Out of the Dust* (about the Dust Bowl and the Great Depression). The literature on the Holocaust, immigration, and the history of various American ethnic groups is especially well recognized and available. Amid the continuing news on Islamic fundamentalism, our colleague Nancy Steineke was able to quickly build a collection of four illuminating YA novels with Islamic protagonists and settings.

Diversity

Missing diversity in your collection? Find blogs and writings by African American scientists on *Scientific American*'s *Urban Scientist* blog: http://blogs.scientificamerican.com/urban-scientist/2012/06/12/african-american-science-bloggers-writers-and-tweeters/. Or go to the website of the Society of Hispanic Professional Engineers, www.national.shpe.org/. And for your fiction

collection, consult some of the following online lists of essential multicultural titles (though we wish more of the books were more recent):

* http://wps.ablongman.com/wps/media/objects/133/136287/multilit.pdf
* www.berkeleypubliclibrary.org/children/good-books/looking-in/
* www.goodreads.com/shelf/show/middle-school-multicultural
* www.goodreads.com/shelf/show/middle-grade-multicultural-books
* ccbc.education.wisc.edu/books/multicultural.asp
* www.ric.edu/astal/multicultural/books.html

For reluctant readers

As we create our classroom libraries, we are serious about having something for everyone, especially our "reluctant readers." To be sure we hook boys, we're quick to stock Gary Paulsen's fiction and nonfiction; *Into Thin Air* and *Into the Wild*, both by Jon Krakauer; *The Perfect Storm* and *Fire* by Sebastian Junger; and *The Last River* by Todd Balf. All are adventure stories with tons of science information and strong narrative lines. For girls, www.goodreads.com/list/show/1816.Best_Teen_Girl-Books provides a long list, mainly of YA novels. We also looked for nonfiction for girls, and while there were no separate lists for this (interesting!), a few caught our eye in the more general Goodreads teens' nonfiction list:

* *The Year We Disappeared: A Father-Daughter Memoir* By Cylin and John Busby
* *Almost Astronauts: 13 Women Who Dared to Dream* by Tanya Lee Stone
* *The Pregnancy Project* by Gaby Rodriguez
* *Ana's Story* by Jenna Bush

But we also go back to Nancy Drew, pile up the Babysitter's Club, stock plenty of Judy Blume and Sharon Draper, and even a few romances, if they want 'em.

There's hardly any point in listing more, since new sources appear all the time. We'd just advise that you provide your classes with a list of interesting and trustworthy websites, rather than leaving students to search randomly on their own.

Using and Managing Your Classroom Library

Keep in mind that when it comes to books, kids don't always have to read the whole thing. Dipping in for a chapter or two works just fine with many nonfiction titles. Many books are promising candidates for jigsawing, where kids read just one section and then combine their

learning in small groups (see page 186–189.) As you build your classroom library, gradually read the books yourself and talk with kids and colleagues, you'll become increasingly skillful at steering individual students toward interesting, readable books—or selections thereof.

On the other hand, do you, the teacher, have to read each of these books before your students do? Absolutely not. If we limit kids to books we have read ourselves, we leave them an unnecessarily narrow choice, limited by our own reading habits or special interests. Besides, there are a million great books for kids, and no full-time teacher has time to read them all. Just build your reading list from trustworthy sources: the suggestions of colleagues, friends, family, and former students; the scoop from magazine and newspaper reviews; blurbs on book-related websites; award sponsors like the American Library Association; and even our professional organizations like the National Council for the Social Studies, which recognize worthy books for young people.

A quick note on censorship. When we invite teenage students to graduate from controlled school books to real grown-up books, we add challenge, rigor, and reality to the curriculum. We also incur some risks. Adult books, even when mainly about historical or scientific matters, sometimes contain adult themes or behavior. In her powerful minimum-wage expose, *Nickel and Dimed*, Barbara Ehrenreich admits to smoking marijuana and then facing a corporate drug test at Wal-Mart, where she was earning $6.50 per hour. *Stupid White Men* uses some bad words, and *God's Fool* has brief but explicit sex scenes, and so forth. These books are meritorious, thoughtful, and important—and none of their risque words or deeds will shock the sensibilities of most contemporary teens.

But if book censorship is a big issue where you teach, then of course you don't *assign* anything questionable. Rather, let kids choose the books they wish to read. If needed, send a copy of any chosen book home with a note to parents saying, "Your student has chosen this book for chemistry class. Let me know if you have any questions or concerns." Most of our colleagues don't explicitly ask for a signature, feeling this notification process is enough to offer parents a chance to object if they must. Parents have heartfelt reasons for protecting their kids from certain ideas. The kid can pick another book.

A few final management tips: it will take classroom organization to keep your library from being permanently borrowed out of existence. Appoint a student as librarian in each class to keep track of everything. Organize storage space so books and articles can be returned to easily identified locations. And remind students how important it is to maintain materials in good condition for their classmates. Finally, try to accept the notion that a "stolen" book may be the highest possible compliment, and keep on collecting.