The Foundation
Text Complexity

Leadership I - Grades 6–8 - Day 3
Advancing Our Students’ Language and Literacy

The Challenge of Complex Texts

BY MARILYN JAGER ADAMS

“Few Changes on SAT Posted by Class of 2010.”1 “Scores on SAT College Entrance Test Hold Steady.”2 “Class of 2008 Matches ’07 on the SAT.”3 Year by year, point by point, it is hard to see the real news in these headlines. The real news is not that the SAT scores have held steady. The real news is that the SAT scores haven’t increased. The SAT scores of our college-bound students have been languishing not for one or two years, but for a long time. Several decades ago, scores were much higher. The SAT score decline began in 1962, nearly 50 years ago. From 1962 to 1980, math scores fell 36 points to 492 while verbal scores fell 54 points to 502. Since 1980, the math scores have been gradually climbing back and are now at 516. Fluctuations aside, the verbal scores remain unchanged, even today stuck at 502.

If I were writing the headline for the next newspaper story on the SATs, here’s what you’d see: “Seniors and Their SAT Scores Sabotaged by Low-Level Textbooks.” And if the copyeditor would let me, I’d add an exclamation point! The literacy level of our secondary students is languishing because the kids are not reading what they need to be reading.

This is a strong claim. Let me lay out the evidence and argument so you can judge for yourself.

Not Just the SAT Scores

To be sure, whether scores on the SAT exams truly reflect relevant or important intellectual or academic proficiencies remains a topic of discussion.4 Yet, the SATs are not the only indication that

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An analysis of 800 schoolbooks published between 1919 and 1991 found that the difficulty of the text had been significantly reduced.

between 1974 and 1998, during the period when the verbal SAT scores were bottoming out.

In international assessments of schoolchildren, the performance of our fourth-graders is above average. However, the performance of our high school students is average, at best. The results of our own National Assessment of Educational Progress (NAEP) show a similar contrast: while the reading of younger students has been improving over time, that of older students has not. NAEP’s analysis of changes in reading performance between 1971 and 2008 shows that average scores of 9-year-olds increased by 12 points. Those of 13-year-olds increased by 4 points. But the average scores of 17-year-olds have not changed. The lack of progress among 17-year-olds is especially jarring when factoring in our dropout problem. Roughly 25 percent of eighth-graders were not able to read eleventh-grade texts. With this in mind, she and her colleagues evaluated popular eleventh-grade texts. Reading researcher Jeanne Chall and her colleagues tested this hypothesis by sampling passages from texts and finding that older students were below the average for same-aged and like-educated peers in the other countries. The young adults in this study would have graduated from high school by the mid-1970s and again in the mid-1980s. Further analyses showed this hypothesis to be largely correct, but only for a brief while. Over the early 1960s, changes in the composition of the tested population accounted for as much as three-quarters of the test score decline—and, no wonder, for during this period the number of students taking the SAT tripled. Over the 1970s, however, though the test-taking population stabilized, the scores did not. Instead, the decline continued, even steeper than before, while the extent to which it could be ascribed to demographic shifts shrank to 30 percent at most. Furthermore, the scores that dropped most were those of the strongest students, the students in the top 10 percent of their class; the scores of students toward the bottom of the distribution held steady or even increased.

Another hypothesis examined by the College Board’s panel was that the reading selections on the tests had somehow become too hard for the students. Reading researcher Jeanne Chall and her colleagues tested this hypothesis by sampling passages from SAT tests administered between 1947 and 1975, and using readability analyses to compare their difficulty. The data indicated that the SAT passages had actually become easier over this period—so scores should have been going up. Further, between 1963 and 1975, during the years of the score decline, the average difficulty of the test passages lay at the eleventh-grade level, which should have been solidly in range for twelfth-grade college-bound students. Yet scores were going down.

Chall thought there had to be some reason why the twelfth-graders were not able to read eleventh-grade texts. With this in mind, she and her colleagues evaluated popular eleventh-grade textbooks in history, literature, grammar, and composition. The average difficulty of the textbooks lay between the ninth- and tenth-grade levels.

Could this discrepancy between the reading level of the SAT and that of the textbooks explain the score decline? If students had neither practiced nor been instructed with reading materials as hard as the SAT passages, then one could hardly expect them to succeed on the test.

The same conclusion was drawn by the College Entrance Examination Board in the mid-1970s and again in the mid-1980s.

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English books. However, even among science texts, only those designated for Advanced Placement coursework evidenced difficulty levels comparable to that of the average daily newspaper for adults.

Such a disparity between the students’ schoolbooks and the passages on the SAT might well explain the decline in SAT scores. More significantly, failing to provide instruction or experience with “grown-up” text levels seems a risky course toward preparing students for the reading demands of college and life.

To wit, while the analyses of Hayes and his colleagues showed that textbooks had become progressively easier over the century, they also indicated that the difficulty of English language newspapers had remained nearly constant.18 Could this disparity be a factor in the declining circulation of newspapers? Similarly, they found the level of the wording of scientific magazines, whether aimed at professionals or laypersons, had increased dramatically from 1930 to 1990.20 If it is a national goal to inspire more students to become engineers and scientists, then shouldn’t the difficulty of our schoolbooks have increased alongside? If a goal is to ensure that our students will be able to stay sufficiently informed about scientific progress to conduct business, reflect on policy, and manage their family’s health and education, then at a minimum, shouldn’t the difficulty of our schoolbooks keep pace with the difficulty of scientific publications aimed at the general public?

**The Vocabulary of Written Language**

Reading educators have long appreciated that there is a very strong relationship between vocabulary and reading comprehension. But what exactly is it about the wording of texts that underlies this relation? Part of the answer is that written texts draw upon many more words than normally arise in oral language situations.20 To gain insight into this phenomenon, Hayes and colleagues compared spoken language with texts.21 For this study, they focused on trade publications rather than school materials, and the texts they used included preschool books, children’s books, comic books, adult books, magazines, newspapers, and abstracts from scientific magazines. For comparison, they compiled and analyzed a variety of oral language samples, including language from prime-time adult television shows, children’s television shows, mothers’ speech to children ranging in age from infancy to adolescence, conversations among college-educated adults (including from the Oval Office), and adults providing expert witness testimony for legal cases. Regardless of the source or situation and without exception, the richness and complexity of the words used in the oral language samples paled in comparison with the written texts. Indeed, of all the oral language samples evaluated, the only one that exceeded even preschool books in lexical range was expert witness testimony.

This difference between the wording of oral and written language must lie at the crux of the advanced literacy challenge, as it points to a profound dilemma. On the one hand, the extent of this disparity implies that the great majority of words needed for understanding written language is likely to only be encountered—and thus can only be learned—through experience with written text. On the other hand, research has taught us that written text is...

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1The scores given in the introduction are all on the new, recentered scale.
accessible—and thus permits learning—only if the reader or listener already knows the vast majority of words from which it is constructed. Indeed, research indicates that reading with comprehension depends on understanding at least 95 percent of the words of a text.22

How Many New Words Do Readers Need to Learn?

So roughly how many words do kids need to learn in order to be proficient readers? This question raises the second key part of the vocabulary problem.

Suppose you counted the number of times each different word in this article occurred. What you would find is that there are a few words that I have used quite a number of times, and many, many others that I used only once or twice. This distribution of word counts or frequencies is an example of what is known as Zipf’s law.23

According to Zipf’s law, every natural language sample is made up of relatively few words that recur and recur again, and many, many words that arise very infrequently. The type of natural language sample does not matter and, provided that it is not too short, neither does its size. That is, whether you counted all the words in a casual conversation, a lecture, a newspaper article, a whole book, or even a whole library’s worth of books, you would find the same thing: of all the different words in your sample, a small number would occur over and over again, while many, many others would occur only once.

Zipf’s law may feel intuitively obvious. Less obvious, however, are its implications with respect to the vocabulary challenge.

An example may vivify the issue. Counting words that appear in relevant text is a common approach to making dictionaries. For example, if you wanted to make a dictionary for geologists, you might begin by gathering a sample of the kind of articles about geology that you think your customers would like to read and then counting the number of occurrences of all the different words within them. The goal is to make sure your dictionary contains all the words that your customers will want to look up most.

Similarly, as part of creating The American Heritage School Dictionary,24 John Carroll and his colleagues were asked to figure out which words should be included by examining children’s reading materials. To do this, the team gathered texts that had been written especially for children in grades 3 through 8, taking care that the collection as a whole captured the range of different kinds of text and topics that the children might read in amounts that were proportionate to how often they could be expected to read them. From across these materials, the team then extracted 10,000 excerpts, totaling 5 million words of text in all, which, after sorting, turned out to include 86,741 different words. Their job was then to figure out which of these 86,741 words arose sufficiently often to warrant inclusion in the dictionary.25

Enter Zipf’s law. Just 109 very frequent words accounted for fully half of the vast sample of children’s reading material that Carroll and colleagues had put together. Indeed, 90 percent of the sample was accounted for by just 5,000 relatively common words. At the other extreme, more than half of the words appeared only once. Still worse: the team estimated that the actual number of different words in the children’s reading materials—that is, the number of different words that would have turned up if they had counted such texts exhaustively rather than just working with excerpts—would have totaled 609,606. Due to Zipf’s law, a sample of 5 million words was just plain too small even to identify—much less to judge the relative frequency of—the vast majority of words that might well have belonged in the dictionary.

But hold it. We are talking about materials that are specifically written for and meant to be understood by schoolchildren in grades 3 through 8. How can they possibly be expected to know more than 600,000 different words?

In fact, many of these words are cousins of each other. For example, if a child knows the word shoe, then she or he is unlikely to experience difficulty with shoes. Similarly, a child probably won’t have trouble with word families like walk, walked, and walk-

Making textbooks easier ultimately denies students the very language, information, and modes of thought they need most to move up and on.

Developing Students’ Vocabulary: Examining the Options

So, what is the best way to help students master the many, many words they must know to understand advanced texts? In broad terms, there appear to be only two options: (1) to endeavor to teach students the words they will need to know, and (2) to expect students to learn new words through reading.

Is direct vocabulary instruction worthwhile? Based on a highly regarded meta-analysis, the answer seems to be a resounding “yes.”26 Across studies involving a variety of students, instructional specifics, and outcome measures, the meta-analysis showed that
direct vocabulary instruction significantly increases knowledge of words that are taught. Just as importantly, students who received vocabulary instruction were found to perform significantly better on global nonspecific vocabulary measures such as standardized tests, indicating that such instruction promotes learning of words beyond those that have been explicitly taught (e.g., being taught a word like *aquarium* helps with indirectly learning words like *aquatic, aqueduct, and aqueous*).

However, we must bear in mind that, by its very nature, direct vocabulary instruction admits coverage of precious few words relative to the magnitude of the challenge. Even if, beginning in grade 1 and continuing through grade 12, teachers consistently taught—and students perfectly retained—20 vocabulary words each and every week, the gain in vocabulary would total only 8,640 words in all (20 words × 36 weeks of school × 12 years), many times fewer than what is required.

Such considerations have led some scholars to argue that the only feasible means by which students might acquire an adequate reading vocabulary is through the process of inferring the meaning of each new word from its context in the course of reading. Indeed, research shows that the probability that students understand and retain any given new word that they encounter in print is 0.05.29

So how far will this get them? Researchers have (generously) estimated that median, middle-class, fifth-grade students read close to 1,000,000 words of text per year, in school and out. Based on Carroll and colleagues’ research, we can expect a million words of reading to include roughly 17,200 different words. If we suppose that the students already know one-quarter of the words in their texts, then the number of new words they should encounter through this reading would equal 12,900 per year. Yet, if the likelihood that the students will understand and retain each of these words is only 0.05, then their vocabulary can only be expected to grow by 645 per year, giving them but 5,160 new words by the time they graduate from high school.

Recalling that even texts that are for students in grades 1 through 8 presume knowledge of at least 100,000 different words, it is clear that both estimates for learning vocabulary fall way short of the need. At the same time, however, both estimates also seem at odds with the intuitive sense that a high school student need be neither a genius nor a tireless scholar to read and understand most materials written for grade-school children.

**Insights from a Computer Model of Vocabulary Acquisition**

For another way to think about vocabulary acquisition, let’s consider an intriguing computer model called Latent Semantic Analysis (LSA) that was developed by Tom Landauer and his colleagues.31 The core mechanism underlying the LSA model is “associative learning.” When a text is input into the LSA model, the computer builds an association between each individual word of the text and the total set of words—that is, the context—in which the word has appeared. Where a word shows up in multiple contexts, the strength of the association between the word and each of the separate contexts is weakened through competition. Where a word arises repeatedly in one particular context, the association between the two is strengthened.

Importantly, the associations between words and contexts in the LSA model are bidirectional. That is, there are links from each word to each of its contexts and also from each context to all of its words. As a result, the full complex of knowledge that is called forth as each word is “read” extends through its contexts to other words, and through those words to other contexts and words. Thus, as the model “reads” the next word of the text and the next and the next, activation spreads to other, related complexes of knowledge, which may well include clusters that have never before been directly represented by any combination of words and contexts the model has ever “read” before.

Moreover, because the model’s knowledge is represented relationally, the addition or modification of any one connection impacts many others, pulling some closer together, pushing some further apart, and otherwise altering the strengths and patterns of connections among words and contexts. Through this dynamic, reading causes the connections that collectively capture LSA’s knowledge of words to grow, shrink, and shift continually, continually, and always in relation to one another.

In short, the model’s response to any text it “reads” extends well beyond what is denoted by the specific words of the text. Further, the richness of the model’s representation of any text that it “reads” depends on how much it already knows. Just as with people,32 the larger its starting vocabulary and the more it has read before, the more it will learn and understand from the next text.

In comparing LSA’s word-learning to that of schoolchildren, the researchers began by “training” it with a set of texts judged comparable to the lifelong learning of a typical seventh-grader. The researchers then gave the model new texts to “read” and measured its vocabulary growth. The results showed that the likelihood that the computer gained adequate understanding of new words it encountered in these new texts was 0.05—just exactly the same as researchers have found for schoolchildren.33

But the results showed something else, too. It turned out that, with each new reading, the model effectively increased its understanding not just of words that were in the text but also of words
that were not in the text. Indeed, measured in terms of total vocabulary gain, the amount the model learned about words that did not appear in a given reading was three times as much as what it learned about words that were in the reading.

“What?” we cry, “How can that be? How can reading a text produce increases in knowledge of words that it does not even contain? That is not credible! It makes no sense!” But wait. If we were talking about knowledge rather than words, then it would make lots of sense. Every concept—simple or complex, concrete or abstract—is learned in terms of its similarities, differences, and relationships with other concepts with which we are familiar. As a simplistic example, when we read about tigers, then, by dint of both similarities and contrasts, we learn more about all sorts of cats and, further, about every subtopic mentioned along the way. The more deeply we read about tigers, the more nuanced and complex these concepts and their interrelations become.

As explained earlier, it was to be expected that LSA’s full response to any new text would spread beyond the content of the text itself. The unexpected discovery was that this dynamic would impact the model’s understanding of individual words. Given that words are really nothing more than labels for interrelated bundles of knowledge, perhaps this should not have been surprising.

In the study that modeled a seventh-grader, the researchers were able to gauge LSA’s overall vocabulary growth by computationally examining changes in the representation of every word to which it had ever been exposed. Yet here is a mull-worthy correlation: unavoidably, the bundles of concepts and relations that emerged or were strengthened through LSA’s reading experience included many that pertained to words that the model had never seen before. An analogous effect might explain why researchers have found time and again that the strength of students’ vocabulary predicts the likelihood that they will learn new words from context, the probability that they will correctly infer a new word’s meaning from context, and both the amount and nature of their reasoning when they are asked to explain how they do so. Even when students are told the meaning of a new word, their prior vocabulary strength predicts the likelihood that they will retain it. (These are known as “Matthew effects,” referring to the notion that the rich get richer and the poor get poorer.) As the reader’s linguistic and conceptual knowledge grows in richness and complexity, it will increasingly support the meanings of many new words and the representation of many new spheres of knowledge.

Cognitive psychologists broadly agree that the meaning of any word consists of bundles of features and associations that are the cumulative product of the reader’s experience with both the word in context and the concepts to which it refers. What is unique about the LSA model is its demonstration that this structure and dynamic can so richly and powerfully evolve through accrued experience with the various contexts in which words do and do not occur—that is, sheerly through reading.

Another way to state the larger point here is that words are not just words. They are the nexus—the interface—between communication and thought. When we read, it is through words that we build, refine, and modify our knowledge. What makes vocabulary valuable and important is not the words themselves so much as the understandings they afford. The reason we need to know the meanings of words is that they point to the knowledge from which we are to construct, interpret, and reflect on the meaning of the text. A core implication of the LSA model is that students’ knowledge of words grows less through any process of inferring their meanings, one by one, based on the sentences in which they arise, than as a product of learning more generally about the contexts in which they arise and of understanding the concepts and relationships to which they refer.

Knowledge, Cognitive Strategies, and Inferences
If reading results in so rich a network of knowledge through nothing more than overlaps and contrasts in associations, then shouldn’t students learn far more efficiently, given active, incisive inference and comprehension strategies? Research indicates that such strategies can be taught and suggests that doing so may improve comprehension. However, inference and comprehension strategies seem to do little to compensate for weak domain knowledge. Instead, research repeatedly shows prior domain knowledge to be a far stronger predictor of students’ ability to comprehend or to learn from advanced texts. Of course, students’ comprehension and learning is also influenced by their reading skills (such as decoding and fluency). But even the advantage of strong reading skills turns out to be greatest for students with strong domain knowledge.

Again, such findings should not be surprising. Cognitive research affirms that there are two modes of reasoning. The first, most common mode is knowledge-based. This sort of reasoning is rapid, extensive, and automatic. This is the sort of reasoning that ensures, for example, that we properly understand the meaning of fan depending on whether the text is about a soccer fan, a ceiling fan, or a peacock’s fan. This is the sort of reasoning that computer models such as LSA statistically emulate.

The second mode of reasoning is conscious and rule-based. Such logical, analytic thought also warrants instructional attention in our schools, as it is our means of deliberately evaluating
and vetting our thoughts for bias, happenstance, and inconsistencies. However, no reasoning strategy, however well-structured, can rival the speed, power, or clarity of knowledge-driven understanding, nor can it compensate for an absence of sufficient information.

There may one day be modes and methods of information delivery that are as efficient and powerful as text, but for now there is no contest. To grow, our students must read lots. More specifically, they must read lots of “complex” texts—texts that offer them new language, new knowledge, and new modes of thought. Beyond the basics, as E. D. Hirsch, Jr., the founder of Core Knowledge, has so forcefully argued, the reading deficit is integrally tied to a knowledge deficit.44

**Back to the Classroom: A Strategy for Developing Advanced Reading**

The capacity to understand and learn from any text depends on approaching it with the language, knowledge, and modes of thought, as well as the reading skill, that it presumes. It would seem, then, that when assigning materials from which students are to learn, there are basically but two choices. Either the materials must be sufficiently accessible in language and concept for the students to read and understand on their own, or the students must be given help as they read. Some students receive such help in their homes, but many do not and, as I have argued elsewhere, this is likely the major factor underlying the achievement gap.45 In any case, because opportunities for one-on-one reading assistance are limited in the typical school setting, educators often feel that their only alternative is to restrict assignments to materials that are within their students’ independent reach. There follows the popularity of so-called high-low texts, intended to offer high interest or information alongside low demands on vocabulary and reading skill.

It was in this spirit, through earnest efforts to ensure full curricular access to all, that the complexity of schoolbooks came to be relaxed. Sadly, as this strategy pulled vortically upon itself, it did not solve the access problem but, instead, made it worse. In terms of literacy growth, making the textbooks easier is an approach that ultimately denies students the very language, information, and modes of thought they need most in order to move up and on. Is there any escape from this dilemma?

The answer is yes, there is, and it follows directly from Zipf’s law. Again, according to Zipf’s law, every coherent text is made up of a few words that recur again and again, and many words that occur just once or only a few times. And, again, Zipf’s law is shown to hold for virtually every natural language domain, regardless of its size, topic, modality, or sophistication.

Let us first consider the implications of Zipf’s law with respect to word-frequency counts such as the one undertaken for *The American Heritage School Dictionary.*46 Recall that the goal of such large frequency counts is to capture as broad and representative a picture of the language as possible. For this reason, the collective texts from which they are constructed are chosen to represent as broad and representative a range of topics and genres as possible while avoiding repetition of any particular topic or text. A consequence of this text-sampling strategy is that the low-frequency words within these word counts fall into two different categories. In the first category are words that are rare because they are complex, technical, obsolete, or esoteric (e.g., *caprifoliaceous, omphaloskepsis, and mumpsimus*). In the second category, however, are words that are rare because their meanings are relatively specific and are often tied to specific contexts, topics, and genres.47 For example, a high-frequency word such as *home* may be expected in texts of many different types and topics of which only a small subset would accept such low-frequency synonyms as *condominium, wigwam, hospice, habitat, birthplace, burrow,* or *warren.* The same holds for the high-frequency word *strong* versus the more specific alternatives *valid, virile, tensile, pungent,* *dominant,* *vibrant, durable, lethal,* *tyrannical,* and *undiluted.* More generally, the greater the information that a word carries, the fewer the topics and contexts in which it will arise.

Because words in both of these two categories are low frequency, both tend to be excluded by readability formulas that are based on large word-frequency counts. Yet, the “information” in

We must organize our readings in every subject so each text bootstraps the language and knowledge needed for the next. Gradually, students will be ready for texts of greater complexity.

In contrast, if your students read several texts on a single topic, they would encounter a number of domain-specific, information-bearing words. In such texts, the words that rise to the top are those most useful for describing the concepts and relationships that are central to that topic. For example, a quick sampling of informational texts about Mars that I picked off the Internet affirms that, without exception, and whether the intended audience was young children or scientists, the nouns *Mars* and *planet* are among the five most frequent in each. The balance of the dominant nouns in each text depends on the subtopic in focus—variously, its moons, its geography, our efforts at its exploration, etc.

With this in mind, and combined with what else we know
A great benefit of a common core curriculum is that it would drive an overhaul of the texts we give students to read, and the kinds of learning and thought we expect their reading to support.

and scaffolding students’ reading materials within any given topic. Ideally, such scaffolding would begin on the very first day of school, with prekindergarten and kindergarten teachers reading aloud stories and nonfiction texts that build on each others’ vocabulary and ideas.

Teachers in any grade (and parents) would do well to follow this relatively straightforward strategy:

1. Select a topic about which your students need to learn. (There will be plenty of time for other topics once you’ve started this process.) If the students are below grade level, begin with shorter, simpler texts.
2. Teach the key words and concepts directly, engaging students in using and discussing them to be sure they are well anchored.
3. As the students learn the core vocabulary, basic concepts, and overarching schemata of the domain, they will become ready to explore its subtopics, reading (or having read aloud to them) as many texts as needed or appropriate on each subtopic in turn.

Gradually and seamlessly, students will find themselves ready for texts of increasingly greater depth and complexity. Better yet, as their expertise on, say, Mars, expands, they will find themselves in a far better position to read about Venus, Jupiter, earth sciences, space exploration, and on and on.

Can advanced texts really be made accessible to less proficient readers in this way? Yes. As a concrete example, no text on dinosaurs would get through a readability formula for second-graders. However, having built up their vocabulary and domain knowledge, many second-graders are able to read and understand remarkably sophisticated texts about dinosaurs with great satisfaction. Similarly, I have rarely met a Boston cabby—no matter how much he decried reading—who wasn’t quick to pick up and read a news article about the Red Sox. Knowledge truly is the most powerful determinant of reading comprehension. The greatest benefits of literacy grow through reading deeply in multiple domains and about multiple topics. We can and must do a better job of leading—and enabling—our students to do so. If education is the key to opportunity, then their options, in school and beyond, depend on it.

The Role of a Common Core Curriculum

There are some who object reflexively to the notion of a common core curriculum. Yet, if you think about it, the very concept of publicly supported schooling is predicated on the belief that there is a certain body of knowledge and abilities that is needed by every citizen for a safe, responsible, and productive life.

Under the Massachusetts School Law of 1642, every town was made responsible for teaching every child “to read perfectly the English tongue,” and to understand the capital laws of the commonwealth and the principles of religion, as well as for ensuring every child was provided an apprenticeship in “some lawful calling, labour, or employment.” In effect, these requirements constituted the colony’s common core curriculum.

In the centuries since then, responsibility for our children’s religious education has been reassigned from the school to families and churches. However, the educational and literacy levels required by the other dimensions of life, liberty, and the pursuit of happiness have exploded. In our times, written language has
become the major medium not just for education but for information in every aspect of life. Further, as priest, professor, and historian Walter Ong has pointed out, the ubiquity of audio support hardly matters: written language is the underlying medium for educated communication regardless of modality.54

The arguments for a common core curriculum are partly that it would be readily accessible to every teacher and school, partly that it would provide continuity and coherence for the millions of students who frequently change schools (an issue E. D. Hirsch, Jr., explores beginning on page 30), and partly that a vocabulary-building curriculum is too big and too hard a job for any teacher or school to put together alone. Creating each unit, for each grade K–12, will depend on judicious selection not just of topics but of the reading materials comprising each unit. From the billions of pages of print that are available, finding those that are both well written and appropriate will take work. The task of building a good core curriculum will require intense effort by teams of educators and scholars, including the best minds and sensibilities available.

In creating a common core curriculum, the goal is neither to dictate nor to limit what all students should be able to know and do. As detailed within this issue of American Educator, the core curriculum might fill only two-thirds of students’ instructional time. Perhaps, too, the units would be populated with alternate sets of readings. After all, as reviewed in this article, the greatest benefit of a well-structured program of reading and learning is that it prepares the student to read other materials with competence and thoughtful comprehension. If education is to nurture interest and support relevancy, it must also leave room for some choice. The purpose of a core curriculum is to build the foundations that will put students in good stead to choose and pursue what they wish to learn and do—which, of course, depends integrally on their being able to learn and do it.

From my perspective, a great benefit of a common core curriculum is that it would drive a thorough overhaul of the texts we give students to read, and the kinds of learning and thought we expect their reading to support. Amid the relatively few SAT headlines this fall, the one written by the College Board, which administers the SAT, stood out: “2010 College-Bound Seniors Results Underscore Importance of Academic Rigor.” As the College Board went on to explain, “students in the class of 2010 who reported completing a core curriculum—defined as four or more years of English, three or more years of mathematics, three or more years of natural science, and three or more years of social science and history—scored, on average, 151 points higher on the SAT than those who did not complete a core curriculum.” We’ve known at least since Socrates that challenging, well-sequenced coursework leads to more learning. It is time for us, as a nation, to act on that knowledge and give all students the common core curriculum they need to be prepared for advanced reading and learning.

Endnotes

9. ACT, Reading between the Lines: What the ACT Reveals about College Readiness in Reading (Iowa City: IA: ACT, 2006).
10. Wirtz et al., On Further Examination; and William W. Turnbull, Student Change, Program Change: Why the SAT Scores Kept Falling (New York: College Entrance Examination Board, 1985).
11. Wirtz et al., On Further Examination.
14. Turnbull, Student Change, Program Change.

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38. National Reading Panel, Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction; Reports of the Subgroups (Washington, DC: National Institute of Child Health and Human Development, 2000).


41. O’Reilly and McNamara, “The Impact of Science Knowledge.”


51. O’Reilly and McNamara, “The Impact of Science Knowledge”; and Shapiro, “Including Prior Knowledge.”


Excerpt from “Every Little Hurricane” by Sherman Alexie

Although it was winter, the nearest ocean four hundred miles away, and the Tribal Weatherman asleep because of boredom, a hurricane dropped from the sky in 1976 and fell so hard on the Spokane Indian Reservation that it knocked Victor from bed and his latest nightmare.

It was January and Victor was nine years old. He was sleeping in his bedroom in the basement of the HUD house when it happened. His mother and father were upstairs, hosting the largest New Year’s Eve party in tribal history, when the winds increased and first tree fell.

“Goddamn it” one Indian yelled at another as the argument began. “You ain’t s**t, you damn apple!”

The two Indians raged across the room at each other. One was tall and heavy, the other was short, muscular. High-pressure and low-pressure fronts.

The music was so loud that Victor could barely hear the voices as the two Indians escalated the argument into a fistfight. Soon there were no voices to be heard, only guttural noises that could have been curses or wood breaking. Then the music stopped so suddenly that the silence frightened Victor.

“What the f**k’s going on?” Victor’s father yelled, his voice coming quickly and with force. It shook the walls of the house.

“Adolph and Arnold are fighting again,” Victor’s mother said. Adolph and Arnold were her brothers, Victor’s uncles. They always fought. Had been fighting since the very beginning.

“Well ,tell them to get their goddamn asses out of my house,” Victor’s father yelled again, his decibel level rising to meet the tension in the house.

“They already left,” Victor’s mother said. “They’re fighting out in the yard.”

Victor heard this and ran to his window. He could see his uncles slugging each other with such force that they had to be in love. Strangers would never want to hurt each other that badly. But it was strangely quiet, like Victor was watching a television show with the volume turned all the way down. He could hear the party upstairs move to the windows, step onto the front porch to watch the battle.
During other hurricanes broadcast on the news, Victor had seen crazy people tie themselves to trees on the beach. Those people wanted to feel the force of the hurricane firsthand, wanted it to be like an amusement ride, but the thin ropes were broken and the people were broken. Sometimes the trees themselves were pulled from the ground and both the trees and the people tied to the trees were carried away.

*From Lone Ranger and Tonto Fistfight in Heaven, by Sherman Alexie
Published by Perennial/Atlantic Monthly Press, 1993
This excerpt is used for professional development purposes only.
ISBN 978-0-06-097624-8*
Excerpts from Chapter 11, *The Miserable Mill*

**By Lemony Snicket**

As we have discussed previously, a book's first sentence can often tell you what sort of story the book contains. This book, you will remember, began with the sentence "The Baudelaire orphans looked out the grimy window of the train and gazed at the gloomy blackness of the Finite Forest, wondering if their lives would ever get any better," and the story has certainly been as wretched and hopeless as the first sentence promised it would be. I only bring this up now so you can understand the feeling of dread that Violet and Sunny Baudelaire experienced as they opened a book in the library of the Lucky Smells Lumbermill. The two Baudelaire sisters already had a feeling of dread, of course. Part of the dread came from how cruelly unfairly Sir had behaved. Another part of the dread came from how Charles, kind as he was, seemed unable to help them. Yet another part of the dread came from the fact that Klaus had been hypnotized once more. And of course, the lion's share of the dread—the phrase "lion's share" here means "the biggest part" and has nothing to do with lions or sharing—came from the fact that Count Olaf—or, as he insisted on calling himself, Shirley—was back in the Baudelaires' lives and causing so much misery.

But there was an extra helping of dread that Violet and Sunny felt when they began Advanced Ocular Science, by Dr. Georgina Orwell. The first sentence was "This tome will endeavor to scrutinize, in quasi inclusive breadth, the epistemology of ophthalmologically contrived appraisals of ocular systems and the subsequent and requisite exertions imperative for expugnation of injurious states," and as Violet read it out loud to her sister, both children felt the dread that comes when you begin a very boring and difficult book.

"Oh dear," Violet said, wondering what in the world "tome" meant. "This is a very difficult book."

"Garj!" Sunny said, wondering what in the world "endeavor" meant. "If only we had a dictionary," Violet said glumly. "Then we might be able to figure out what this sentence means."

"Yash!" Sunny pointed out, which meant something like "And if only Klaus weren't hypnotized, then he could tell us what this sentence means."

Violet and Sunny sighed, and thought of their poor hypnotized brother. Klaus seemed so different from the brother they knew that it was almost as if Count Olaf had already succeeded with his dastardly scheme, and destroyed one of the Baudelaire orphans. Klaus usually looked interested in the world around him, and now he had a blank expression on his face. His eyes were usually all squinty from reading, and now they were wide as if he had been watching TV instead. He was usually alert, and full of interesting things to say, and now he was forgetful, and almost completely silent.
"Who knows if Klaus could define these words for us?" Violet asked. "He said it felt like part of his brain had been wiped clean. Maybe he doesn't know all those words when he's hypnotized. I don't think I've heard him define anything since the accident with Phil, when he explained the word 'inordinate.' You might as well get some rest, Sunny. I'll wake you up if I read anything useful."

Sunny crawled up on the table and lay down next to Advanced Ocular Science, which was almost as big as she was. Violet gazed at her sister for a moment, and then turned her attention to the book. Violet liked to read, of course, but at heart she was an inventor, not a researcher. She simply did not have Klaus's amazing reading skills. Violet stared at Dr. Orwell's first sentence again, and just saw a mess of difficult words. She knew that if Klaus were in the library, and not hypnotized, he would see a way to help them out of their situation. Violet began to imagine how her brother would go about reading Advanced Ocular Science, and tried to copy his methods.

First she turned back the pages of the book, back before even the first page, to the table of contents, which as I'm sure you know is a list of the titles and page numbers of each chapter in a book. Violet had paid scarcely any attention to it when she first opened the book, but she realized that Klaus would probably examine the table of contents first, so he could see which chapters of the book might be most helpful. Quickly she scanned the table of contents:

1. Introduction 1
2. Basic Ophthalmology 105
3. Nearsightedness and Farsightedness 279
4. Blindness 311
5. Itchy Eyelashes 398
6. Damaged Pupils 501
7. Blinking Problems 612
8. Winking Problems 650
9. Surgical Practices 783
10. Glasses, Monocles, and Contact Lenses 857
11. Sunglasses 926
12. Hypnosis and Mind Control 927
13. Which Eye Color Is the Best One? 1,000

Immediately, of course, Violet saw that chapter twelve would be the most helpful, and was glad she'd thought of looking at the table of contents instead of reading 927 pages until she found something helpful. Grateful that she could skip that daunting first paragraph—the word "daunting" here means "full of incredibly difficult words"—she flipped through Advanced Ocular Science until she reached "Hypnosis and Mind Control."

The phrase "stylistic consistency" is used to describe books that are similar from start to finish. For instance, the book you are reading right now has stylistic consistency, because it began in a miserable way and will continue that way until the last page. I'm sorry to say that Violet realized, as she began chapter twelve, that Dr. Orwell's book had stylistic consistency as well. The first sentence of "Hypnosis and Mind Control" was "Hypnosis is an efficacious yet precarious methodology and should not be assayed by neophytes," and it was every bit as difficult and boring as the first sentence of the
whole book. Violet reread the sentence, and then reread it again, and her heart began to sink. How in the world did Klaus do it? When the three children lived in the Baudelaire home, there was a huge dictionary in their parents' library, and Klaus would often use it to help him with difficult books. But how did Klaus read difficult books when there was no dictionary to be found? It was a puzzle, and Violet knew it was a puzzle she had to solve quickly.

She turned her attention back to the book, and reread the sentence one more time, but this time she simply skipped the words she did not know. As often happens when one reads in this way, Violet's brain made a little humming noise as she encountered each word—or each part of a word—she did not know. So inside her head, the opening sentence of chapter twelve read as follows: "'Hypnosis is an hmmm yet hmmm method hmmm and should not be hmmmed by hmmms,'" and although she could not tell exactly what it meant, she could guess. "It could mean," she guessed to herself, "that hypnosis is a difficult method and should not be learned by amateurs," and the interesting thing is that she was not too far off. The night grew later and later, and Violet continued to read the chapter in this way, and she was surprised to learn that she could guess her way through pages and pages of Dr. Orwell's book.

This is not the best way to read, of course, because you can make horribly wrong guesses, but it will do in an emergency.

From The Miserable Mill (A Series of Unfortunate Events, Book 4), by Lemony Snicket
Published by HarperCollins Publishers © 2000 by Lemony Snicket.
This excerpt is used for professional development purposes only.
ISBN 9780064407694
# Updated Text Complexity Grade Bands and Associated Ranges from Multiple Measures

<table>
<thead>
<tr>
<th>COMMON CORE BAND</th>
<th>ATOS</th>
<th>DEGREES OF READING POWER®</th>
<th>FLESCH-KINCAID²</th>
<th>THE LEXILE FRAMEWORK®</th>
<th>READING MATURITY</th>
<th>SOURCERATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>2\textsuperscript{nd} – 3\textsuperscript{rd}</td>
<td>2.75 – 5.14</td>
<td>42 – 54</td>
<td>1.98 – 5.34</td>
<td>420 – 820</td>
<td>3.53 – 6.13</td>
<td>0.05 – 2.48</td>
</tr>
<tr>
<td>4\textsuperscript{th} – 5\textsuperscript{th}</td>
<td>4.97 – 7.03</td>
<td>52 – 60</td>
<td>4.51 – 7.73</td>
<td>740 – 1010</td>
<td>5.42 – 7.92</td>
<td>0.84 – 5.75</td>
</tr>
<tr>
<td>6\textsuperscript{th} – 8\textsuperscript{th}</td>
<td>7.00 – 9.98</td>
<td>57 – 67</td>
<td>6.51 – 10.34</td>
<td>925 – 1185</td>
<td>7.04 – 9.57</td>
<td>4.11 – 10.66</td>
</tr>
<tr>
<td>9\textsuperscript{th} – 10\textsuperscript{th}</td>
<td>9.67 – 12.01</td>
<td>62 – 72</td>
<td>8.32 – 12.12</td>
<td>1050 – 1335</td>
<td>8.41 – 10.81</td>
<td>9.02 – 13.93</td>
</tr>
</tbody>
</table>

Find links and instructions for using these quantitative analysis tools at [achievethecore.org/text-complexity](http://achievethecore.org/text-complexity).

\[1\] The band levels themselves have been expanded slightly over the original CCSS scale that appears in Appendix A at both the top and bottom of each band to provide for a more modulated climb toward college and career readiness and offer slightly more overlap between bands. The wider band width allows more flexibility in the younger grades where students enter school with widely varied preparation levels. This change was provided in response to feedback received since publication of the original scale (published in terms of the Lexile® metric) in Appendix A.

\[2\] Since Flesch-Kincaid has no ‘caretaker’ that oversees or maintains the formula, the research leads worked to bring the measure in line with college and career readiness levels of text complexity based on the version of the formula used by Coh-Metrix.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Very Complex</th>
<th>Moderately Complex</th>
<th>Readily Accessible</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning</td>
<td>Multiple levels of meaning that may be difficult to identify, separate, and interpret; theme is implicit, subtle, or ambiguous and may be revealed over the entirety of the text.</td>
<td>Multiple levels of meaning that are relatively easy to identify; theme is clear but may be conveyed with some subtlety.</td>
<td>One level of meaning: theme is obvious and revealed early in the text.</td>
<td></td>
</tr>
<tr>
<td>Text Structure</td>
<td>Prose or poetry includes more intricate elements such as subplots, shifts in point-of-view, shifts in time or non-standard text structures.</td>
<td>Prose includes two or more storylines or has a plot that is somewhat difficult to predict (e.g.: in the case of a non-linear plot); poetry has some implicit or unpredictable structural elements.</td>
<td>Prose or poetry is organized clearly and/or chronologically; the events in a prose work are easy to predict because the plot is linear; poetry has explicit and predictable structural elements.</td>
<td></td>
</tr>
<tr>
<td>Language Features</td>
<td>Language is generally complex with abstract, ironic, and/or figurative language, and regularly includes archaic, unfamiliar, and academic words; text uses a variety of sentence structures including complex sentences with subordinate phrases and clauses.</td>
<td>Language is often explicit and literal but includes academic, archaic, or other words with complex meaning (e.g.: figurative language); text uses a variety of sentence structures.</td>
<td>Language is explicit and literal, with mostly contemporary and familiar vocabulary; text uses mostly simple sentences.</td>
<td></td>
</tr>
<tr>
<td>Knowledge Demands</td>
<td>The text explores complex sophisticated or abstract themes; text is dependent on allusions to other texts or cultural elements; allusions or references have context and require inference and evaluation.</td>
<td>The text explores several themes; text makes few references or allusions to other texts or cultural elements; the meaning of references or allusions may be partially explained in context.</td>
<td>The text explores a single theme; if there are any references or allusions, they are fully explained in the text.</td>
<td></td>
</tr>
</tbody>
</table>

**Quantitative Analysis**

<table>
<thead>
<tr>
<th>Lexile:</th>
<th>Flesch-Kincaid:</th>
<th>Reading Maturity Metric:</th>
<th>Final Placement</th>
</tr>
</thead>
</table>

Briefly explain recommended placement

Complexity Level _____

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<thead>
<tr>
<th>Criteria</th>
<th>Very Complex</th>
<th>Moderately Complex</th>
<th>Readily Accessible</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning</td>
<td>The text contains multiple purposes, and the primary purpose is subtle, intricate, and or abstract.</td>
<td>The primary purpose of the text is not stated explicitly but is easy to infer based upon context or source; the text may include multiple perspectives.</td>
<td>The primary purpose of the text is clear, concrete, narrowly focused, and explicitly stated; the text has a singular perspective.</td>
<td></td>
</tr>
<tr>
<td>Text Structure</td>
<td>Connections among an expanded range of ideas, processes, or events are often implicit, subtle, or ambiguous; organization exhibits some discipline-specific traits; any text features are essential to comprehension of content.</td>
<td>Connections between some ideas, processes, or events are implicit or subtle; organization is generally evident and sequential; any text features help facilitate comprehension of content.</td>
<td>Connections between ideas, processes, and events are explicit and clear; organization is chronological, sequential, or easy to predict because it is linear; any text features help readers navigate content but are not essential to understanding content.</td>
<td></td>
</tr>
<tr>
<td>Language Features</td>
<td>Language is generally complex, with abstract, ironic, and/or figurative language, and archaic and academic vocabulary and domain-specific words that are not otherwise defined; text uses many complex sentences with subordinate phrases and clauses.</td>
<td>Language is often explicit and literal but includes some academic, archaic, or other words with complex meaning; text uses some complex sentences with subordinate phrases or clauses.</td>
<td>Language is explicit and literal, with mostly contemporary and familiar vocabulary; text uses mostly simple sentences.</td>
<td></td>
</tr>
<tr>
<td>Knowledge Demands</td>
<td>The subject matter of the text relies on specialized, discipline-specific knowledge; the text makes many references or allusions to other texts or outside areas, allusions or references have no context and require inference.</td>
<td>The subject matter of the text involves some discipline-specific knowledge; the text makes some references or allusions to other texts or outside ideas; the meaning of references or allusions may be partially explained in context.</td>
<td>The subject matter of the text relies on little or no discipline-specific knowledge; if there are any references or allusions, they are fully explained in the text.</td>
<td></td>
</tr>
<tr>
<td>Use of Graphics (optional)</td>
<td>Graphics are essential to understanding the text; they may clarify or expand information in the text and may require close reading and thoughtful analysis in relation to the text.</td>
<td>Graphics are mainly supplementary to understanding of the text; they generally contain or reinforce information found in the text.</td>
<td>Graphics are simple and may be unnecessary to understanding the text.</td>
<td></td>
</tr>
</tbody>
</table>

**Quantitative Analysis**

<table>
<thead>
<tr>
<th>Lexile</th>
<th>Flesch-Kincaid:</th>
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<tr>
<td></td>
<td>Reading Maturity</td>
</tr>
<tr>
<td></td>
<td>Metric RMM:</td>
</tr>
</tbody>
</table>

*Complexity Level _______*
Features of Complex Text

- Complex sentences
- Uncommon vocabulary
- Lack of words, sentences or paragraphs that review or pull things together for the student
- Longer paragraphs
- Any text structure which is less narrative and/or mixes structures
- Subtle and/or frequent transitions
- Multiple and/or subtle themes and purposes
- Density of information
- Unfamiliar settings, topics or events
- Lack of repetition, overlap or similarity in words and sentences

Grammatical and Rhetorical Features of Complex Text

- Information density (dependent clauses and phrases within sentences)
- The use of nominalizations
- Passive voice
- A combination of complex and simple sentences
- The use of adverbial clauses and phrases to situate events
- Ellipses
- The use of abstract agents as subjects
- The use of devices for backgrounding and foregrounding information

Determining Text Complexity

- **What**: The characteristics of the text
  - Qualitative/quantitative evaluation
  - Reader-task considerations
- **Who**: The characteristics of the reader
  - Reading ability
  - Age, experience
  - Motivation
- **Why**: The purpose for the reading
  - Assignment type (research, pleasure, analysis of writer’s craft)
- **Where** and **When**: The conditions of the reading—
  - Teacher/parent guided
  - Independent
  - Group discussion/literary circle,
  - Instruction vs. assessment
Excerpt from *The Pearl* by John Steinbeck

Kino awakened in the near dark. The stars still shone and the day had drawn only a pale wash of light in the lower sky to the east. The roosters had been crowing for some time, and the early pigs were already beginning their ceaseless turning of twigs and bits of wood to see whether anything to eat had been overlooked. Outside the brush house in the tuna clump, a covey of little birds chittered and flurried with their wings.

Kino’s eyes opened, and he looked first at the lightening square which was the door and then he looked at the hanging box where Coyotito slept. And last he turned his head to Juana, his wife, who lay beside him on the mat, her blue head shawl over her nose and over her breasts and around the small of her back. Juana’s eyes were open too. Kino could never remember seeing them closed when he awakened. Her dark eyes made little reflected stars. She was looking at him as she was always looking at him when he awakened. ...

Kino heard the creak of the rope when Juana took Coyotito out of his hanging box and cleaned him and hammocked him in her shawl in a loop that placed him close to her breast. Kino could see these things without looking at them. Juana sang softly an ancient song that had only three notes and yet endless variety of interval. And this was part of the family song too. It was all part.

Sometimes it rose to an aching chord that caught the throat, saying this is safety, this is warmth, this is the Whole. Across the brush fence were other brush houses, and the smoke came from them too, and the sound of breakfast, but those were other songs, their pigs were other pigs, their wives were not Juana. Kino was young and strong and his black hair hung over his brown forehead. His eyes were warm and fierce and bright and his mustache was thin and coarse. He lowered his blanket from his nose now, for the dark poisonous air was gone and the yellow sunlight fell on the house. Near the brush fence two roosters bowed and feinted at each other with squared wings and neck feathers ruffed out. It would be a clumsy fight. They were not game chickens. Kino watched them for a moment, and then his eyes went up to a flight of wild doves twinkling inland to the hills. The world was awake now, and Kino arose and went into his brush house. ...

The sun was warming the brush house, breaking through its crevices in long streaks. And one of the streaks fell on the hanging box where Coyotito lay, and on the ropes that held it. It was a tiny movement that drew their eyes to the hanging box. Kino and Juana froze in their positions. Down the rope that hung the baby’s box from the roof support a scorpion moved slowly.

His stinging tail was straight out behind him, but he could whip it up in a flash of time. Kino's breath whistled in his nostrils and he opened his mouth to stop it. And then the startled look was gone from him and the rigidity from his body. In his mind a new song had come, the Song of Evil, the music of the enemy,
of any foe of the family, a savage, secret, dangerous melody, and underneath, the Song of the Family cried plaintively.

The scorpion moved delicately down the rope toward the box. Under her breath Juana 6 repeated an ancient magic to guard against such evil, and on top of that she muttered a Hail Mary between clenched teeth. But Kino was in motion. His body glided quietly across the room, noiselessly and smoothly. His hands were in front of him, palms down, and his eyes were on the scorpion.

Beneath it in the hanging box Coyotito laughed and reached up his hand toward it. It sensed Danger when Kino was almost within reach of it. It stopped, and its tail rose up over its back in little jerks and the curved thorn on the tail's end glistened.

Kino stood perfectly still. He could hear Juana whispering the old magic again, and he could hear the evil music of the enemy. He could not move until the scorpion moved, and it felt for the source of the death that was coming to it. Kino's hand went forward very slowly, very smoothly. The thorned tail jerked upright. And at that moment the laughing Coyotito shook the rope and the scorpion fell.

Kino's hand leaped to catch it, but it fell past his fingers, fell on the baby's shoulder, landed and struck. Then, snarling, Kino had it, had it in his fingers, rubbing it to a paste in his hands. He threw it down and beat it into the earth floor with his fist, and Coyotito screamed with pain in his box. But Kino beat and stamped the enemy until it was only a fragment and a moist place in the dirt. His teeth were bared and fury flared in his eyes and the Song of the Enemy roared in his ears. ...