



Knowledge Matters

Restoring Wonder and Excitement to the Classroom

Top Three Takeaways

1. Reading comprehension—the ability to make meaning from text—is a reflection of a child’s overall education; it depends on quality instruction in science, social studies, and the arts as well as in reading.

2. The only way to close the reading achievement gap is to provide a well-rounded education starting on the very first day of school, when the academic knowledge and vocabulary gaps are smallest.

3. Any accountability system aimed at improving reading achievement must actively incentivize a patient, long-term investment in developing academic knowledge and vocabulary.

Lisa Hansel is director of Knowledge Matters. Previously, she was the editor of American Educator, the magazine of education research and ideas published by the American Federation of Teachers. Robert Pondiscio is executive director of Knowledge Matters and also senior fellow at the Thomas B. Fordham Institute. Previously, he was a 5th grade teacher at a South Bronx public school.

Job One: Build Knowledge

ESSA Creates an Opportunity—and an Obligation—to Help Every Child Become a Strong Reader

By Lisa Hansel and Robert Pondiscio

Executive Summary

Once the Every Student Succeeds Act (ESSA) became law, state and district leaders entered into a remarkable period of opportunity. For the first time since early this century, they have the flexibility to incentivize schools to significantly increase student achievement in reading comprehension. Although boosting literacy was a top priority under No Child Left Behind, misunderstandings about the nature of reading comprehension combined with pressure to demonstrate adequate yearly progress drove many elementary schools to narrow their curricula. Believing that more time devoted to reading instruction would increase reading ability, less time was given to social studies, science, and the arts. Unfortunately, that logical belief is incorrect. The foundational skills that children need to master (e.g., fluently sounding out words) can be accomplished in fairly short periods of systematic daily instruction. What takes more time is building the broad knowledge and large vocabulary on which comprehension depends—precisely the content children learn in high-quality social studies, science, and arts classes.

With ESSA, states have the flexibility to rethink how reading test results are used, and to support schools in developing children with both strong word-reading skills (e.g., decoding) and a substantial foundation of academic knowledge and vocabulary. Given the large knowledge and vocabulary gaps that already exist when children enter school, systematically building skills, knowledge, and vocabulary throughout the elementary grades is our best hope for closing the reading achievement gap.



A paradox lies at the heart of efforts to raise reading achievement: If elementary schools take time away from science, social studies, and the arts in order to dramatically increase time on reading instruction, they are more likely to slow children's growth in reading comprehension than to increase it. This slowing won't be apparent right away; it might not be apparent in the elementary grades at all. But in later grades—when students are expected to read historical speeches or science textbooks or biographies of artists—they will struggle. Reading comprehension is not a “skill” like riding a bike or throwing a ball. A child does not become a strong reader by learning and practicing reading alone. Reading comprehension—the ability to make meaning from text—is best thought of as a reflection of a child's overall education. Thus, reading comprehension depends on an education rich in science, social studies, and the arts as well as in reading.¹

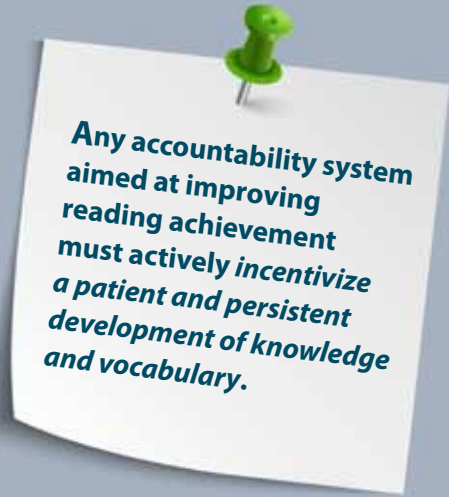
This policy brief boils down to one simple idea: We must ensure that all children receive a knowledge-rich, well-rounded education starting on the very first day of school.

Unlike mathematics and the foundational skills of reading (e.g., decoding or sounding out words), which are largely “school-based” subjects that respond comparatively quickly to remediation efforts, comprehension is highly influenced by experiences outside school.² Comprehension, in part, reflects a child's general store of knowledge and vocabulary—a store that's stocked both at home and at school. By its very nature, it grows slowly and cumulatively, making it less “instructionally sensitive” than math or decoding. Think of knowledge and vocabulary like compound interest: If one kindergartner comes to school on Day One having heard 30 million more words than a less-fortunate peer,³ the “interest” on her knowledge and vocabulary allows her to grow richer still; the child with less academic knowledge and vocabulary falls further behind day after day.⁴

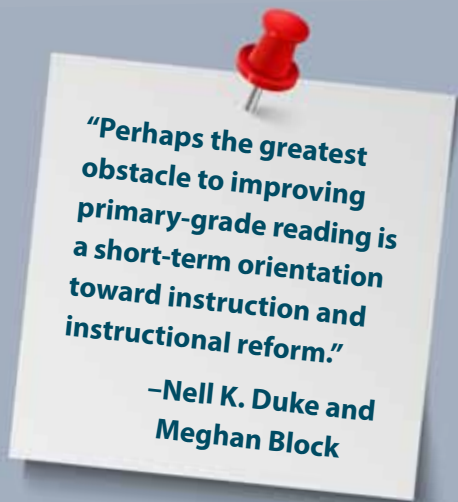
At its heart, the achievement gap is a gap in opportunity to learn academic knowledge. And there can be no quick solution. Therefore, any accountability system aimed at improving reading achievement must actively *incentivize a patient and persistent development of knowledge and vocabulary*. The children of well-educated parents typically gain these benefits at home and in school. Low-income children, by sharp contrast, are equally capable of learning, but have far fewer opportunities to be immersed in academic subject matter and enrichment.⁵ Policymakers must do everything in their power to ensure all children, but particularly those in low socioeconomic status families, benefit from a knowledge-rich curriculum from the earliest possible moment.

To accomplish that goal, policymakers will need to take a careful look at their assessment and accountability policies, asking: Do these policies incentivize schools to patiently invest in building students' knowledge and vocabulary? Or, do they spur schools to look for quick gains?

In the main, the tests our children take to measure their reading ability are reliable and valid. But policymakers have used these instruments in ways that send conflicting instructional signals to districts, schools, and teachers. No Child Left Behind-era accountability initiatives rightly signaled the importance



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of reading. However, this laudable urgency led to a demand for quick results, prompting schools to focus on the aspects of reading most likely to drive quick gains when a long view is what's needed. As Nell K. Duke, one of the nation's top reading researchers, and Meghan Block wrote in *The Future of Children*:⁶

Perhaps the greatest obstacle to improving primary-grade reading is a short-term orientation toward instruction and instructional reform. When the aim is to show reading improvements in a short period of time, spending large amounts of time on word-reading skill and its foundations, and relatively little on comprehension, vocabulary, and conceptual and content knowledge, makes sense. Measurable gains in phonological awareness, alphabet knowledge, and word reading can be achieved quickly, and, for most students, relatively easily. In contrast, gains in comprehension, vocabulary, and conceptual knowledge are harder to measure, at least in young children, and harder to achieve. Yet the long-term consequences of failing to attend to these areas cannot be overstated.

The reason why it takes such a long time to build *measurable gains* in knowledge and vocabulary is that the topics on reading tests are unpredictable. Reading comprehension tests always have passages on a variety of topics; anything from the aurora borealis to zydeco music might be included. Since teachers do not know what topics may appear on the test, they cannot directly prepare students to meet the tests' knowledge and vocabulary demands. When faced with severe consequences for their students not attaining a certain reading score or gain, it is understandable that teachers would focus on the skills (and test-prep tricks) that provide quick boosts. Building knowledge, which is critical to long-term reading success, becomes a secondary concern.

Although there is little research on curricula or the allocation of instructional time, one nationally representative survey of elementary teachers offers stark evidence of a severe problem.⁷ As shown in the table below, teachers in K-3 report spending just 16 minutes a day on social studies and 19 minutes on science. The situation is not much better in grades 4-6, where just 45 minutes a day are devoted to social studies and science combined.

Average Number of Minutes per Day Spent Teaching Each Subject in Self-Contained Classes, by Grades		
	Grades K-3	Grades 4-6
Reading/Language Arts	89 mins.	83 mins.
Mathematics	54 mins.	61 mins.
Science	19 mins.	24 mins.
Social Studies	16 mins.	21 mins.

Only teachers who indicated they teach reading/language arts, mathematics, science and social studies to one class of students were included in these analyses.
Report of the 2012 National Survey of Science and Math Education, Table 4.2.

A recent study led by Susan Neuman, who has long been at the forefront of early literacy research, paints an even grimmer picture.⁸ In multiple observations

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Curriculum is the hiding-in-plain-sight lever that policymakers have seldom thought to pull.

of 55 kindergarten classrooms, Neuman’s research team found no systematic vocabulary instruction and many classrooms that did not teach science or social studies at all (across all observations, they found an average of two minutes per day of science and one minute of social studies). The little vocabulary teaching that did occur was sporadic and, because of disparities across classrooms, likely to increase the achievement gap.⁹

In short, the evidence suggested that vocabulary instruction observed in a large group of kindergarten classrooms consisted of word explanations during “teachable moments” throughout the day. We found that teachers serving in the more economically advantaged schools provided more of these teachable moments and addressed more challenging words than teachers serving in high-poverty schools.

Overall, the researchers “observed minimal instruction that might build vocabulary and conceptual knowledge to support long-term comprehension goals.”¹⁰

“The mistaken idea that reading is a skill,” notes cognitive scientist Daniel Willingham, “may be the single biggest factor holding back reading achievement in the country. The knowledge base problem must be solved.”¹¹

These understandings—that reading comprehension ability is largely a reflection of a child’s breadth of knowledge, and that knowledge is foundational, slow-growing, and unequally distributed along socioeconomic lines—must be at the heart of any successful accountability system. The Every Student Succeeds Act (ESSA) provides states the flexibility they need to appropriately value reading test scores while also ensuring all children get the well-rounded education that leads to enduring gains in reading comprehension. Of course, ESSA also provides the flexibility for states to ignore these issues. It’s up to all of us to ensure that the new freedom is used responsibly—especially to enrich our neediest students with academic knowledge and equalize opportunity to learn.

It is not a mystery why reading comprehension scores are so stubbornly tied to socioeconomic status: Knowledge and vocabulary grow exponentially, beginning at birth. Children with well-educated parents come to school with larger vocabularies and more school-related knowledge.¹² Their verbal advantage grows each day during dinnertime conversations, bedtime read-alouds, weekend museum visits, sports and music lessons, and other forms of “concerted cultivation.”¹³ That gives new knowledge and vocabulary fertile soil in which to root. The gaps don’t merely persist, they widen. The longer we wait, the wider the gap grows.

Valorizing knowledge acquisition is the secret sauce that’s missing from education policy, testing, and accountability. Preferred policy areas—like teacher quality, choice, charters, and merit pay—are agnostic to curricular content. This is a hiding-in-plain-sight lever that policymakers have seldom thought to pull. ESSA must change that.

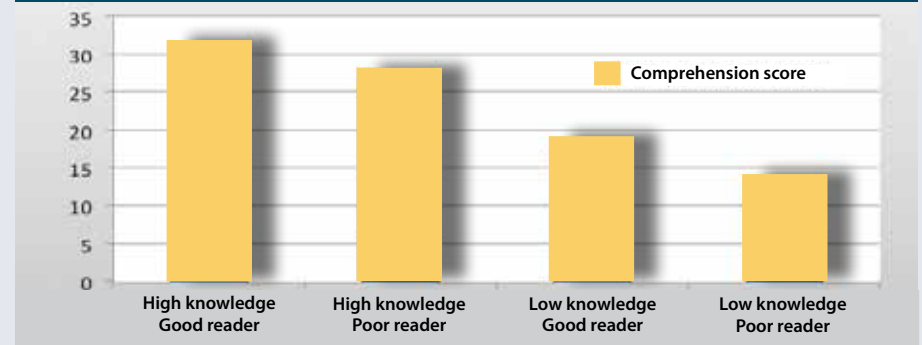
In order to boost reading achievement, America’s elementary schools must make building knowledge Job One. And every major initiative in American education—from curriculum development to testing and accountability—should ensure that schools and teachers are encouraged and supported to do exactly that.

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Overwhelming Evidence that Knowledge Matters

The scientific evidence on the importance of knowledge for comprehension and critical thinking is overwhelming.¹⁴ Consider just one iconic study by Donna Recht and Lauren Leslie that looked at junior-high students who were either "good" or "poor" readers based on test scores.¹⁵ In both groups, there were some who knew a lot about baseball and some who knew little. All of the kids were then given a passage describing a half inning of a baseball game along with a test of their comprehension. If reading comprehension were a "skill" that could be taught, practiced, and mastered—the way most schools teach and test it today—then the students who were "good" readers should have had no trouble outperforming the "poor" readers. Yet "poor" readers who knew a lot about baseball easily outperformed "good" readers who knew little about the game. In other words, knowing a lot about the subject made the poor readers good readers.

For Comprehension, Knowledge Matters More Than Reading Ability

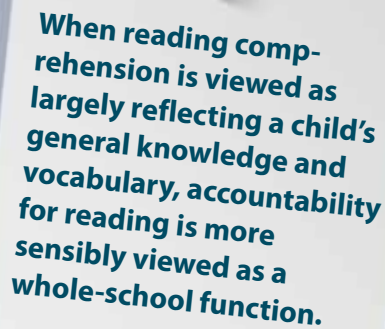


Evidence like this calls into question what it means to be a strong or weak reader. Children who know more about the world—those with the broadest base of background knowledge and largest vocabularies—are more likely to show good scores on reading tests. The reason is simple: Both broad general knowledge and topic-specific knowledge are necessary to extract and construct meaning from language. The problem is, schools spend astonishingly little time building knowledge—and our most disadvantaged students get the least.

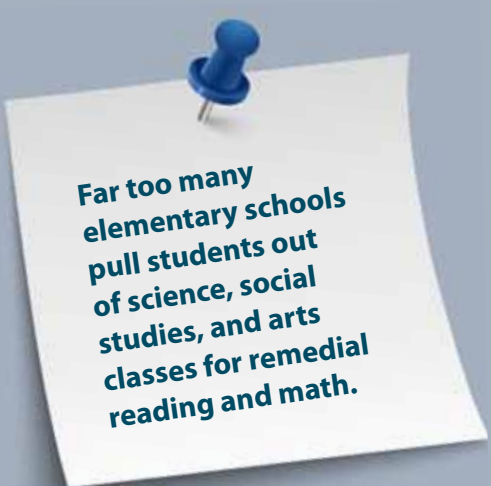
Making "Every Student Succeeds" a Reality

ESSA gives states significant leeway in evaluating and supporting schools. If states commit to incentivizing knowledge-rich curricula, they can use that leeway to increase achievement and equality. In the spirit of ESSA, in which each state will develop its own unique approach, we offer seven flexible, adaptable recommendations.

1) Look for unintended consequences of accountability policies. To incentivize a knowledge-rich curriculum, states should think carefully about the instructional signals sent by their existing accountability policies and proposals. ESSA takes a great step in this direction by basing accountability on multiple measures. Some states may wish to minimize the stakes attached to annual



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reading tests, while encouraging all schools to have knowledge-rich curricula. Others may want to rethink when the stakes ought to be high and for whom. When reading comprehension is (correctly) viewed as largely reflecting a child's general knowledge and vocabulary, accountability for reading comprehension is more sensibly viewed as a whole-school function rather than attributable primarily to individual teachers.

Take the comparatively simple task of teaching students to decode. At a minimum, it requires K–2 teachers. For students who struggle, reading specialists, special education teachers, speech pathologists, and others are often involved. Now consider building knowledge. Individual teacher accountability on a fourth-grade reading comprehension test, for instance, is *unfair* because children's comprehension depends in part on what they've learned every year, in school and out. It's also *unproductive* because it lets the early-grade teachers off the hook if they don't contribute by teaching the knowledge-building subjects. In contrast, school-wide accountability for reading could foster teamwork and give the stronger teachers more of an incentive to help their colleagues improve.

Yet some states may want to maintain some individual-focused accountability structures. Elliot Regenstein of the Ounce of Prevention Fund offers a sensible solution: an external inspectorate of teaching, particularly in the untested early grades. Regenstein wisely notes that “great teaching in the early years is both rigorous in its content and fun for the kids in its delivery. It requires far more skill than many education leaders understand.”¹⁶ But that lack of understanding makes creating an effective inspectorate very challenging. In England, for example, the inspectorate system reinforces ineffective practices, according to educator-turned-researcher Daisy Christodoulou.¹⁷ States would have to be vigilant to create and sustain productive inspectorates, but the reward is likely to be well worth the effort. In such a system, reading assessments would provide important context for inspectors and should remain an essential diagnostic tool. Critically, their use would incentivize—or at least not discourage—a patient and persistent investment in academic knowledge and vocabulary development across the curriculum and throughout the school day.

2) Encourage and support well-rounded curricula. With ESSA, states are not just looking at outcomes; they are examining students' opportunities to learn. In developing such indicators, states could strategically incentivize building knowledge and vocabulary—particularly for schools serving children least likely to develop it outside of school. Even a simple indicator for elementary schools—such as requiring at least 150 minutes per week on science, another 150 on social studies, plus 60 on music and art—could send a strong signal on priorities. That signal would be even stronger if schools were required to ensure that all students met these minimal time requirements. Right now, far too many elementary schools pull students out of science, social studies, and arts classes for remedial reading and math, an approach that is wrong for all the right reasons.¹⁸

For the lowest 5 percent of schools, states should consider reviewing their curricula and offering far more support and resources for adopting and teaching with knowledge-rich materials. While some schools may not realize the importance of building academic knowledge, especially in the early grades, others may grasp the need but struggle to find strong materials, so states will have to customize the supports they offer. States could consider creating

partnerships and/or professional learning communities that bring together the highest- and lowest-performing schools (within some reasonable distance for school visits). If “highest performing” is defined as those with the largest gains, then they may have some valuable lessons and resources to share. States could also gather and place online the curricula of consistently high-performing schools as models for other schools to adopt or adapt.

States that would rather signal the importance of science, social studies, and the arts without being so directly involved could explore ESSA’s portfolio options. There are many ways for schools to demonstrate students’ learning across the curriculum. Interdisciplinary current-events projects, for example, could engage students in studying important topics from multiple angles, building knowledge and skills together. Under any scenario, the essential understanding for schools and teachers must be clear: Science, social studies, and arts should not be viewed as competing with reading. They are correctly viewed as *foundational and non-negotiable* to reading.

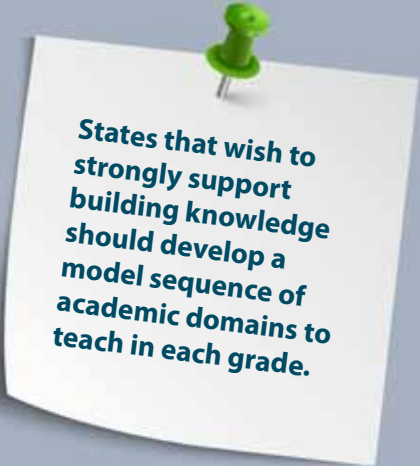
3) Using the ESSA pilot provision, create a state-wide sequence and sequence-based reading tests. States that wish to strongly support building knowledge should convene educators, researchers, and subject-matter experts to collaboratively develop a model sequence of academic domains to teach in each grade. Most states have already taken a few steps in this direction with their standards; the sequence would enhance those standards with specific topics while clarifying how those topics build on each other within and across grades. This model sequence should be readily available online as a scaffold for districts and schools as they develop their curricula, but it should not be mandatory.*

The sequence should specify academic domains (such as ancient Egypt or gravity) for every subject in each grade. Above all, it should be coherent and cumulative, ensuring that all children within a district or state gain the benefits of broad knowledge—including in art and music—by the end of eighth grade. Such a sequence would have two major benefits. First, teacher preparation and professional development could guarantee that all teachers have deep knowledge of the domains they are responsible for teaching. Second, children who change schools would have far less interruption in their education. Moving to a new neighborhood between grade levels would no longer result in learning about marine mammals twice while missing out on the three branches of government.

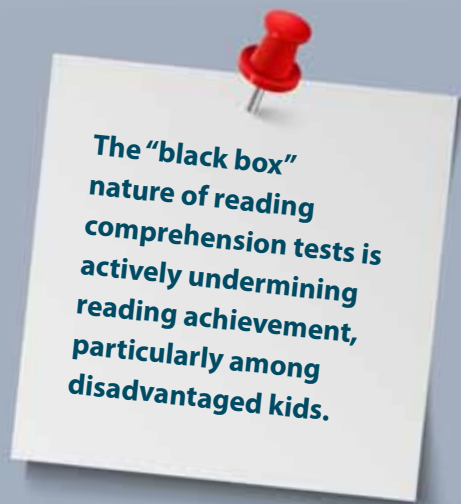
Once districts and schools have had time to develop and implement sequence-based curricula, states participating in ESSA’s assessment pilot[†] could transition to sequence-based reading comprehension assessments for grades 3–8. Sequence-based reading assessments would make the subject matter of the passages predictable (like most assessments in other subjects), reassuring teachers that if they teach the specified domains, their students will be optimally prepared to comprehend the passages they are to be tested on.

* If policymakers need to be convinced there’s a demand for this, they should check out the number of downloads in their own states of materials developed for EngageNY.org. These materials have been used by teachers across the country, not just the New York instructors they were built to serve.

† ESSA’s innovative assessment pilot encourages up to seven states to completely rethink the role of testing in teaching and learning.



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The importance of this to the teaching profession and to incentivizing good practice cannot be overstated.¹⁹ The “black box”²⁰ nature of reading comprehension tests is actively undermining reading achievement, particularly among disadvantaged kids.²¹

Ideally, sequence-based assessments would be cumulative. Instead of tests with reading passages that sample some topics only from the domains for that grade, they would sample from all of the domains in the current and prior grades. This mirrors the cumulative nature of building knowledge and places appropriate responsibility on K–2 teachers. Most importantly, it rewards consistent investment in knowledge and vocabulary—precisely what is missing from current practice (and disincentivized in current accountability policies). Cumulative, sequence-based reading comprehension assessments would incentivize schools to teach everything in the sequence, leading to broad academic knowledge, reducing the extent to which scores are a reflection of what has been learned at home, eliminating the temptation to spend time on test-prep drills, and providing a more accurate picture of the schools’ contributions to children’s performance.

4) Increase teachers’ subject-matter expertise. In recent years, many states have made great advances in elementary certification. According to the National Council on Teacher Quality’s *2015 State Teacher Policy Yearbook*, “Just six years ago not a single state required elementary teacher candidates to demonstrate adequate knowledge in all core subjects as a condition of licensing; in 2015, states’ policy on teacher licensing is much improved.... Twenty-two states now demand that elementary teachers demonstrate content knowledge by obtaining passing scores on academic content tests in each core subject they will teach.”²² That’s great progress, but NCTQ also identified a major loophole: “In 38 states, teachers can teach in elementary school grades on an early childhood license. However, only seven states require early childhood teachers to pass a content test with separate scores for reading and mathematics among other subjects.”²³

Clearly, teachers can’t teach what they don’t know. Boosting the knowledge demands of certification tests increases the likelihood that all teachers have an adequate base of subject-matter expertise. NCTQ’s research indicates that most states have an opportunity to use their certification requirements in support of knowledge-rich education.

States wishing to go further could also consider ways to enable elementary teachers to develop subject specialties. The generalist elementary teacher—responsible for all subjects—made sense when we all thought the elementary years were mainly about acquiring basic skills in reading and math, supplemented with introductory lessons in science, social studies, and the arts. Because of the differences in what children learn at home and the speed with which the knowledge and vocabulary gaps grow, equity demands a new approach to elementary school. In the early years, children must learn to read and also listen to learn. Carefully planned teacher read-alouds and explanations, plus discussions and projects, enable children to engage with academic subject matter long before they can read.²⁴ In short, the knowledge children need to be introduced to throughout the elementary years is far more sophisticated than previously thought. For many teachers, mastering science, social studies, mathematics, and language arts—as well as the pedagogical expertise to support English learners and those with special needs—may be unrealistic.



Educators need not become experts in cognition, but they should understand how comprehension, learning, memory, and critical thinking work.

States could support co-planning and team teaching so as to pool and spread teachers' subject-matter expertise. Some elementary schools have moved in this direction by dividing subjects—giving some teachers responsibility for language arts and social studies, and others responsibility for science and mathematics, with teachers working closely together. A side benefit of this approach is that it's more difficult to reduce the time spent on science and social studies.


5) Provide information on how the mind works. In recent years, cognitive scientists have made many advances that are critical to teaching and learning. Educators need not become experts in cognition, but they should understand how comprehension, learning, memory, and critical thinking work.²⁵ At a minimum, teachers and administrators should understand (a) why broad academic knowledge is necessary for reading comprehension, (b) why deep knowledge is necessary for critical thinking, and (c) which methods for building knowledge are most efficient. Even a basic understanding would radically alter how schools respond to children who struggle. A great deal of "remedial" instruction would look more like enrichment, with students engaged in learning about our world.

For a strong outline of the cognitive science all educators ought to know, see *The Science of Learning*, published by Deans for Impact.²⁶ It offers a framework that states could use to create a new teacher and administrator certification requirement. Or, for a lighter touch, states could simply email *The Science of Learning* to all teachers and administrators, encouraging them to bring it into their existing professional development structures.

6) Start early to overcome disparities in young children's opportunities to acquire academic knowledge. No matter how states plan to build students' knowledge, they must start early.²⁷ As Nell K. Duke and her colleagues explained in *What Research Has to Say about Reading Instruction*, knowledge and comprehension are supposed to make a virtuous cycle:²⁸

Over the past 20 years, cognitive psychologists have reached broad consensus on the nature of comprehension.... We bring knowledge to the comprehension process, and that knowledge shapes our comprehension. When we comprehend, we gain new information that changes our knowledge, which is then available for later comprehension. So, in that positive, virtuous cycle, knowledge begets comprehension, which begets knowledge, and so on. In a very real sense, we literally read and learn our way into greater knowledge about the world and greater comprehension capacity.

In an environment rich with opportunities to acquire knowledge, learning grows exponentially. That's wonderful for the children who arrive at school with a large vocabulary and well-stocked store of academic knowledge. But many children don't; the knowledge and vocabulary gap is evident long before children begin school, and it grows every year (especially in schools where there isn't a concerted effort to build knowledge until after children have learned to read). The earlier we start building knowledge, the greater our chances of closing the gap. Job One must begin on Day One.



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However, elementary schools alone will not solve the problem. States that are truly dedicated to closing the achievement gap must also do far more to address disparities in opportunities to learn outside of school. Every single day, some students get an extra dose of academic knowledge and vocabulary at home; others don't. The further behind a child is, the more time he needs in school and the more access he needs to weekend and summer enrichment. Proactive states would offer preschool for 3- and 4-year-olds, require full-day kindergarten, and extend the school day, week, and year for our neediest students. They would also increase funding for libraries, museums, book mobiles, and programs that support parents in reading to and with their children every day.

7) Use the bully pulpit. Given America's tradition of local control of schooling, it's no surprise that most state policymakers have viewed the curriculum—what gets taught—as a district- or school-level decision. That remains adequate provided local officials understand and place a premium on knowledge development throughout the school day, and take appropriate steps to broaden, not narrow, curriculum. State leaders can continue to honor that tradition by avoiding curricular mandates; they can also support educational improvement by helping all educators understand the importance of broad and deep knowledge.

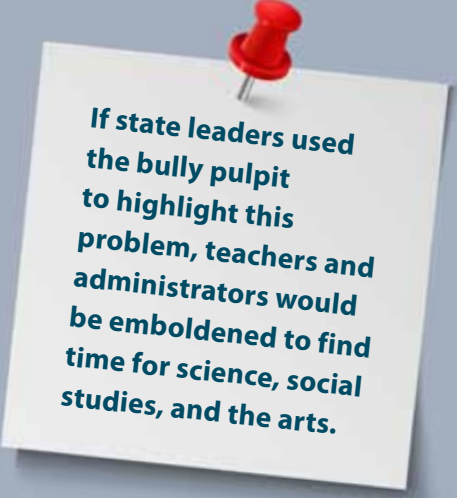
Elementary teachers and administrators have narrowed the curriculum with the best of intentions and in response to policy priorities. Many believe—logically, albeit incorrectly—that if children master sounding out words and practice reading with books of their choice in the early grades, then they will be ready to dive into more academic subject matter in the later grades. The popular phrase for this is “learning to read and then reading to learn.”

Unfortunately, it doesn't really work. With middle-class and advantaged children, it *appears* to work because they acquire the knowledge and vocabulary they need at home. The less fortunate children don't; they become what researchers dub “word callers.”²⁹ These children have learned to sound out words—but they don't know what those words mean. To close the reading achievement gap—to turn word callers into strong readers—we must provide an education rich in science, social studies, and the arts.

If state leaders used the bully pulpit to highlight this problem, teachers and administrators would be emboldened to find time for science, social studies, and the arts. Some schools may want to bring texts on these subjects into the literacy or language arts block, others may want to increase the time dedicated to each subject. Either way, children could be immersed—through teacher read-alouds, class discussions and projects, and texts the children read—in academic subject matter throughout each and every day.

* * *

These are but a handful of ideas among many. The overarching principle is what wise policymakers must keep in mind: Reading comprehension is not a skill that educators teach, it's a condition they create. Accountability plans must ensure that every student gets the broad knowledge and vocabulary that remain unacknowledged drivers of language proficiency. Higher standards simply cannot be met without them.



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Endnotes

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Robert Pondiscio

Executive Director

Robert@KnowledgeMattersCampaign.org

Lisa Hansel

Director

Lisa@KnowledgeMattersCampaign.org

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