aft A Union of Professionals

VOL. 38, NO. 2 | SUMMER 2014
www.aft.org/ae

AMERICAN Educator

A QUARTERLY JOURNAL OF EDUCATIONAL RESEARCH AND IDEAS

The Magic of WORDS

LEARNING IN THE EARLY CHILDHOOD CLASSROOM
PAGE 4

ALBERT SHANKER INSTITUTE

It's Not Just Baby Talk

The Albert Shanker Institute, in cooperation with the AFT and other organizations and experts, has developed a range of materials designed to help parents and early childhood educators build the knowledge and vocabulary in young children necessary for their success.

Go to **www.shankerinstitute.org/early-childhood-education** to find:

- Information about the Albert Shanker Institute's Let's Talk Professional Development Series for early childhood educators: "Let's Talk Foundations of Oral Language Development!," "Let's Talk Mathematics!," "Let's Talk Science!," and "Let's Talk Early Literacy!"
- *Literacy Ladders*, a virtual volume of *American Educator* articles on oral language development and early literacy, with a new overview by Marilyn Jager Adams.
- *Preschool Curriculum: What's In It for Children and Teachers*, an accessible research synthesis of how and how much young children learn in the academic domains.
- "Words Reflect Knowledge," a three-minute animation about the "30 million word gap" between rich and poor children and how to prevent it.

A Strong Start for All Young Learners

RANDI WEINGARTEN, President, American Federation of Teachers

THE TRUE MARVEL of young children is their boundless curiosity, unyielding energy, and unending ability to absorb new concepts.

High-quality early childhood education nurtures all these wonderful traits and helps build a foundation for children's long-term success in school and in life. Efforts to expand access to affordable, high-quality early childhood programs are gaining momentum. Legislation such as the Strong Start for America's Children Act, introduced last year in the U.S. Senate, would provide funding to expand early childhood education opportunities, develop quality partnerships, increase wages for early childhood educators, and support professional development.

As we continue these efforts, we also must ensure that the climate of hyper-testing currently in vogue in the K–12 world isn't wrongly transferred to our early learners.

Unfortunately, the mentality of testing over teaching and learning is beginning to seep into early childhood education. Children who should be exuding excitement are increasingly sitting still for long periods of time, tasked with filling in bubbles to answer often-confusing questions.

The impact of our national intoxication with testing has been well documented in the K–12 years. The United States is the only country that administers standardized tests to every child every year, which results in a fixation on testing that squeezes out vital parts of the curriculum and robs students of much-needed learning time.

Standardized testing is at cross-purposes with many of the most important goals of public education. It doesn't measure big-picture learning, critical thinking, perseverance, problem solving, creativity, or curiosity, yet those are the qualities that great teaching brings out in a student.

And that starts in the early childhood years. Research—and just plain common sense—tells us that young children learn actively, through hands-on experiences. This process is not always linear or quantifiable—expecting young children to know specific facts or skills at specific ages simply does not make sense.

Yet in states across the country, officials are developing Common Core State Standards for pre-K, without ensuring that these standards are appropriate for young children. At the same time, some states also are asking early childhood educators to begin to prepare their students for K–3 Common Core assessments—pushing developmentally inappropriate practices into those crucial early learning years.

Years of research show that the best way to assess the progress of our early learners is through the expertise of teachers who know how to observe and interpret young children's activities and behavior. Teachers like Irma Voss, a preschool teacher in Chicago.

"They need something that's hands-on, something that's tangible that the child can touch and see, as opposed to something that's written down," Voss says. "These big-time companies, they push their stuff, but every child doesn't do well with that."

The AFT has launched a multipronged attack on testing that aims to ensure that early childhood educators like Irma are able to keep doing what they do best—help our early learners discover the joy of learning by engaging them in developmentally appropriate ways, while assessing the whole child, instead of turning them into a data point from the beginning.

The AFT is taking on big testing companies such as Pearson Education, which recently agreed to discuss the gag orders and lack of transparency around standardized tests that are fueling a growing distrust and backlash among parents, students, and educators about whether current testing protocols are in the best interests of children.

We are fighting back against VAM, or value-added measurements. These measurements, which are generated by unreliable algorithms, are being used to evaluate teachers, despite being developed initially for other purposes—and over the objections of leading researchers.

MICHAEL CAMPBELL

Randi Weingarten visits with pre-K students at W. B. Patterson Elementary School in Washington, DC.

We are working to change accountability systems so that they focus on improving and supporting rather than testing and punishing. Together with parents, teachers, students, and communities, we are fighting to turn our public education system around to restore the focus to teaching and learning, not testing above all else.

Our youngest learners possess an innate curiosity and joy for learning that we need to nurture—not squelch. That is why our fight is so important. Let's give our children the early education they need and deserve by ensuring that they are engaged in developmentally appropriate programs that foster their social and emotional development—and by ensuring that early childhood educators are supported in their efforts to meet the individual needs of every child. In this issue of *American Educator*, we highlight approaches to early childhood education that can help our youngest learners shine.

AMERICAN Educator
VOL. 38, NO. 2 | SUMMER 2014
www.aft.org/ae

aft A Union of Professionals

OUR MISSION

The **American Federation of Teachers** is a union of professionals that champions fairness; democracy; economic opportunity; and high-quality public education, healthcare and public services for our students, their families and our communities. We are committed to advancing these principles through community engagement, organizing, collective bargaining and political activism, and especially through the work our members do.

AMERICAN EDUCATOR (ISSN 0148-432X, USPS 008-462) is published quarterly by the American Federation of Teachers, 555 New Jersey Ave. NW, Washington, DC 20001-2079. Phone: 202-879-4400.
www.aft.org

Letters to the editor may be sent to the address above or to **ae@aft.org**.

AMERICAN EDUCATOR cannot assume responsibility for unsolicited manuscripts.

Please allow a minimum of four weeks for copyright permission requests.

Signed articles do not necessarily represent the viewpoints or policies of the AFT.

AMERICAN EDUCATOR is mailed to AFT teacher members as a benefit of membership, and to faculty in colleges of education. Subscriptions represent $2.50 of annual dues. Non-AFT members may subscribe by mailing $10 per year by check or money order to the address below.

MEMBERS: To change your address or subscription, notify your local union treasurer.

POSTMASTER: Send address changes to American Educator, 555 New Jersey Ave. NW, Washington, DC 20001-2079.

Periodicals postage paid at Washington, DC, and additional mailing offices.

Cover illustration:
LIZA FLORES

Giving Young Children the Curriculum They Deserve

In recent years, a growing consensus has emerged about the importance of early childhood education. Educators, policymakers, and researchers recognize that because students come to school with large differences in their prior learning, early childhood classrooms can help level the playing field. They understand that early learning can help those children who lag far behind their peers catch up on what they need to succeed in school.

But it's not just a matter of children entering the classroom early. Simply having 3- or 4-year-olds attend school does not guarantee they will be prepared to achieve in later grades. What many in education tend to overlook is the role that curriculum, in the hands of a talented and caring educator, plays in a child reaching his or her full potential.

The AFT has long been at the forefront of advocating for early childhood education and for greater access to rich learning opportunities for young learners.

This special collection of articles in *American Educator* highlights the importance not only of early learning, but also of what, exactly, young children learn. It begins with an article explaining the research on children's oral vocabulary development and how educators can effectively support students in learning new words. Acquiring and understanding a significant amount of vocabulary in the early years helps children build the necessary background knowledge that will lay the foundation for future learning.

It goes without saying that such a foundation must be rock solid. Each article makes clear that curriculum in early childhood classrooms must be content-rich, meaning that students should be exposed to the full range of academic subjects and disciplines: English language arts, mathematics, social studies, and science, as well as music and the arts.

For too long, several myths have persisted in the field of early childhood education, including that young children are not ready to learn sophisticated content, and that they find it boring. Yet these long-held beliefs simply don't hold up against years of evidence, some of which is presented in the following pages.

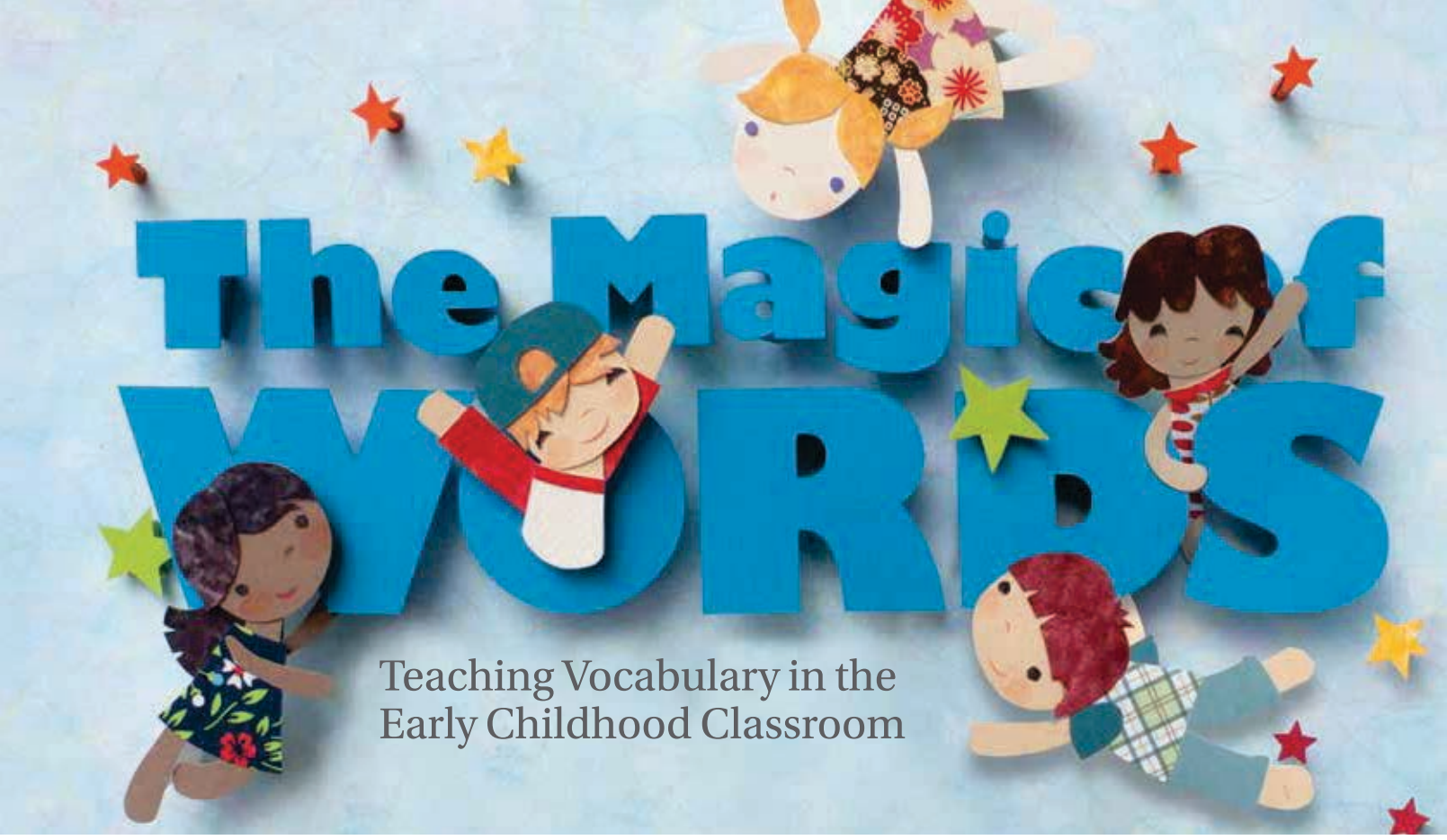
Besides noting the elements that make an early childhood curriculum challenging yet still child-friendly, this issue also highlights a strong example of one such curriculum: Core Knowledge Language Arts. This program for preschool through third grade offers a phonics-based approach to teaching reading and writing skills, and features engaging and informative materials for teachers to share with their students on topics such as the five senses, Native Americans, astronomy, early Asian civilizations, and insects, among other complex subjects that young children are eager to explore and are fully capable of learning.

The AFT has long been at the forefront of advocating for early childhood education. Creating greater access to rich learning opportunities for young learners, especially for those who live in poverty and need extra preparation for school, continues to be an important focus of the union's work. While early childhood education takes place in various settings, including home daycare providers and daycare centers, schools are the central convening point for content. To that end, we hope these articles help all early childhood educators meet the needs of their students. Recently, the AFT, in conjunction with the National Center for Learning Disabilities, has developed a second edition of *Transitioning to Kindergarten* (highlighted on page 41 and the back cover of this issue), with practical tips for educators, parents, and others on how to support preschoolers as they adjust to the next grade level.

Also, to better inform policymakers and help classroom teachers, *American Educator* maintains an archive of its research-based articles on early childhood education, available for free at www.aft.org/newspubs/periodicals/ae/subject.cfm.

For years, the emphasis on developing students' reading and mathematics skills has too often left content in the elementary grades and in early childhood education settings bereft of substance. As the push to expand early learning opportunities finally gains momentum, it's time to give curriculum the attention it deserves. In doing so, we can ensure that young children learn the meaningful content that is essential to the high-quality education they *all* deserve.

–EDITORS



Teaching Vocabulary in the Early Childhood Classroom

By Susan B. Neuman and Tanya S. Wright

It seems almost intuitive that developing a large and rich vocabulary is central to learning to read. Logically, children must know the words that make up written texts in order to understand them, especially as the vocabulary demands of content-related materials increase in the upper grades. Numerous studies have documented that the size of a person's vocabulary is strongly related to how well that person understands what he or she reads, not only in the primary grades, but in high school as well.[1]

Yet here's the practical problem. Right from the beginning of schooling, there are profound differences in vocabulary knowledge among young learners from different socioeconomic groups. Just consider the following statistics: by age 4, a child's interaction with his or her family has already produced significant vocabulary differences across socioeconomic lines, differences so dramatic that they represent a 30 million word "catastrophe" (i.e., children from high-income families experience, on average, 30 million more words than children from low-income families).* Recent analyses indicate that environmental factors associated with vocabulary development and emergent literacy skills are already present among children as early as 15 months of age.[2] By first grade, unfortunately, the repercussions become all too clear: children from high-income families are likely to know about twice as many words as children from low-income families, putting these children at a significantly higher risk for school failure.[3]

Even more disturbing, however, is that these statistics are often treated as inevitable, more or less a byproduct of poverty or low-income status. Think of the consequences! This would mean that these children could be designated as reading failures before they ever enter through the schoolhouse doors.

Luckily, there is now a rich and accumulated new knowledge base that suggests a far different scenario. Consider these points:

- The highest rate of vocabulary development occurs during the preschool years; therefore, it represents a crucial time when we can intervene.[4]
- Effective vocabulary intervention can ameliorate reading difficulties later on. Children with resolved vocabulary delays can go on to achieve grade-level expectations in fourth grade and beyond.[5]
- The quantity, quality, and responsiveness of teacher and parent talk can effectively *mediate* socioeconomic status, thereby

Susan B. Neuman is a professor and chair of the Teaching and Learning department at the Steinhardt School of Culture, Education, and Human Development at New York University. Previously, she was a professor of educational studies at the University of Michigan, where she directed the Ready to Learn Project. She has authored numerous books on early childhood, including Giving Our Children a Fighting Chance: Poverty, Literacy, and the Development of Information Capital. *Tanya S. Wright is an assistant professor in the Department of Teacher Education at Michigan State University.* *This article is adapted, with permission of Teachers College Press, from Susan B. Neuman and Tanya S. Wright,* All About Words: Increasing Vocabulary in the Common Core Classroom, PreK–2. *New York: Teachers College Press.*

*For more on this vocabulary gap, see "The Early Catastrophe" in the Spring 2003 issue of *American Educator*, available at www.aft.org/newspubs/periodicals/ae/spring2003/hart.cfm.

ILLUSTRATIONS BY LIZA FLORES

ensuring children's growth in receptive and expressive vocabulary.[6]
- Gains in oral vocabulary development can predict growth in comprehension and later reading performance.[7]

This means that, in contrast to dire prognostications, there is much we can do to enable children to read and read well. Although we certainly have more to learn, the good news is that we now have an accumulated body of evidence on the characteristics of effective vocabulary instruction. And it turns out that this news couldn't come at a better time.

Oral Vocabulary Development and the Common Core State Standards

You might say that we are entering into a new age of educational reform: the age of the Common Core State Standards (CCSS). In the distant past, education was a local issue; districts acted on their own to adopt instructional guidelines and curriculum. In recent years, however, education has increasingly become more of a state and even a federal concern. The No Child Left Behind Act, the Bush administration's reauthorization of the Elementary and Secondary Education Act, increased the role of states in enacting standards, assessments, and accountability. In 2010, state governments took their turn, becoming more proactive in educational reform. The Council of Chief State School Officers and the National Governors Association, working with the organization Achieve, set out to develop world-class standards that would essentially create a shared vision of what all students should know and be able to do in all grades, kindergarten through high school.

The reason that this is relevant for those in early education on up is that 46 states and the District of Columbia have adopted these Common Core State Standards in English language arts and mathematics. The standards don't define *how* teachers should teach, but they do tell them *what* students need to know and be able to do. Further, starting in 2014–2015, state tests will be geared toward measuring whether or not students are achieving these standards. In essence, education is moving toward a more unitary system with a shared vision of expectations for student learning.

These CCSS represent a sea change in how we think about early literacy and reading, in particular, even before children enter kindergarten and throughout the early grades.[†] Here, in a nutshell, are some of the design features:

- **A cumulative model of expectations:** It used to be called "spiraling," but the principle is the same. From grade to grade, similar standards will increase in complexity. For example, in kindergarten, children will be expected to "ask and answer questions about key details in a text, with prompting and support." Grade 1 has the same exact standard, although the children will now be required to do it on their own.
- **Informational texts:** Right from the start, the standards place greater emphasis on listening to and eventually reading informational books. In this respect, the standards focus on the integration of knowledge and ideas through text. Further, there is the expectation that children will be able to cross traditional genre boundaries and compare and contrast text features; for example, children might listen to an informational book about insects one day and a story about insects the next day, and then be asked about the connections between the two. Children will be expected to learn about key subject areas, particularly science and history, through texts.

Certainly, this does not mean that we are going to abandon the children's literature or stories that we all have come to know and love. Rather, it simply means a greater balance between literary storybooks and informational texts.

By first grade, children from high-income families are likely to know about twice as many words as children from low-income families.

- **Challenging materials:** There is greater emphasis on stretching students to meet the demands of reading harder text than before. In the past, we used to try to meet children's needs by selecting reading materials according to their instructional level; in some cases, when they have difficulty comprehending text, we'll even choose an easier text and have them gradually build up speed for more challenging materials. The CCSS use a very different model: children are required to read grade-level text. A teacher's job will be to help them learn through these more challenging texts without telling them what the texts say. For example, a teacher might focus on the organizational features of the text, the headings and subheadings, or the use of the glossary to unlock the meaning of words in context.

[†]For more on how the Common Core State Standards will transform English language arts instruction, see "Letting the Text Take Center Stage" in the Fall 2013 issue of *American Educator*, available at www.aft.org/pdfs/americaneducator/fall2013/Shanahan.pdf.

- **An integrated model of literacy:** Although the standards are divided into reading, writing, speaking and listening, and language, there is an expectation that all of these skills work together. Even kindergartners are expected to engage in rich conversations that place a greater emphasis on their abilities to build arguments from evidence in the text, whether it is read to them or they read it themselves.
- **An integrated media environment:** There is a greater recognition that today's "texts" don't come through only one medium—print. As all of us know, a high volume of information comes through print and nonprint media forms, both old and new. The CCSS encourage teachers to make use of multimedia, as it's embedded into every aspect of today's curriculum. Children will need to be able to gather, comprehend, evaluate, and synthesize information and ideas through different forms of media.

Without vocabulary knowledge, words are just words—without much meaning.

In short, these standards focus on results rather than on means. They establish clear goals and expectations that are designed to help children succeed in a world in which the development of information capital is increasingly important. And whether they are ultimately successful in achieving these lofty goals depends on teachers and how well they are supported in implementing these new standards in the classroom.*

So how do the CCSS relate to oral vocabulary development? And, for those who work with preschoolers or even younger children, how do K–12 standards affect what they teach? Here's why teachers need to be informed about these standards: it is impossible for children to read, and to understand what they read, without a strong foundation in oral vocabulary development. Without vocabulary knowledge, words are just words—without much meaning. If we are to help children take on seriously challenging texts, then we need to give them word and world knowledge to bring to these texts. Given that most oral vocabulary development grows from a massive immersion in the world of language, there is not a moment to waste.

The purpose of this article is to explain our rationale for content-rich oral vocabulary instruction in the age of the CCSS, and how to effectively build children's vocabulary. But first, we dispel some of the common myths about oral vocabulary development, which have often led to a lack of attention for this important topic in school instruction. We then move to a set of instructional principles that should guide teachers' work.

Common Myths

Like many myths, these notions may contain some partial truths, almost like folk wisdom. For example, some authorities once claimed that learning was based on the "neural ripening" of the brain; applied to reading, this reflected a philosophy of "wait and see" until the child appeared "ready" for instruction. Research and writings in the 1950s and 1960s by cognitive psychologists provided powerful evidence that early childhood was crucial in the cognitive development of an individual.[8] This conclusion led to designing new opportunities to engage children in early learning.

Similarly, a number of myths have been perpetuated about oral vocabulary development, and in many ways they have stymied efforts to promote quality teaching early on. Recent evidence has called into question these notions, and it suggests that we not only can improve children's vocabulary—we can *accelerate* it with instruction. These new findings have powerful implications for further reading development and content learning.

Myth 1: Children Are Word Sponges

Children seem to pick up words prodigiously and quite effortlessly. It looks natural. In one classic study, for example, researchers taught preschoolers a new color word simply by requesting, "You see those trays over there? Bring me the *chromium* tray. Not the red one, the *chromium* one."[9] When their memory for the new word was assessed one week later, the majority of children (63 percent) were able to correctly identify which color was chromium. Since this experiment, the term *fast mapping*—the notion that words can be learned based on a single exposure—has become common parlance to explain the extraordinary rate at which children seem to pick up words early on.

Today, however, there is ample evidence to suggest that children do not learn words through fast mapping.[10] Rather, they learn words by predicting relationships between objects and sounds, which become more accurate over time. Word learning is incremental.[11] Evidence for this comes from children's struggles to understand color words. Although infants can distinguish between basic color categories, it is not until about age 4 that they can accurately apply these individual color terms.[12] Typically, words such as *red* or *yellow* may appear in their vocabulary; however, their application of these words to their referents may be haphazard and interchangeable.

*For more on why teachers need proper training and support to implement the Common Core State Standards, and why these standards should be delinked from high-stakes testing, see "Common Core: Do What It Takes Before High Stakes," by Randi Weingarten, available at www.huffingtonpost.com/randi-weingarten/common-core-do-what-it-ta_b_3300790.html.

Children, then, may have knowledge of these words, but this knowledge will be far from complete. Rather, word learning in most cases requires many exposures over an extended period of time.[13] With each additional exposure, the word may become incrementally closer to being fully learned.

Myth 2: There Is a Vocabulary Explosion

It is often said that word learning starts rather slowly, then at about 16 months or when a child learns about 50 words, all of a sudden things begin to happen.[14] Word learning begins in earnest. Variously called the "vocabulary explosion" or "word spurt," it reflects the apparent dramatic ability of young children to acquire new words—on the scale of learning 10 or more new objects and names within a two- or three-week period. This notion of a vocabulary explosion may suggest that the optimal time for oral vocabulary development is in these toddler years.

Recent evidence, however, suggests that the "spurt" in word learning does not correspond to any change in the rate of word learning, but to a change in the rate of children's integrating new vocabulary.[15] In other words, it suggests that the vocabulary explosion is a byproduct of the variation in the time it takes to learn to actually use words. Although children are accumulating words at a constant rate, the written and verbal use of the words accelerates. We see, for example, a similar pattern with receptive and expressive language, with children demonstrating far greater capacity to understand meaning before they are able to effectively express ideas in words.

The course of word learning, therefore, has little to do with vocabulary explosions, bursts, or spurts. To the contrary, word learning is cumulative.[16] The high-performing student who knows many thousands of words has learned them not by having received a jolt of oral language early on, but by accruing bits of word knowledge for each of the thousands of words encountered every day. By the end of high school, one estimate is that college-ready students will need to acquire about 80,000 words.[17] This means that we should immerse students for extended periods in oral and written vocabulary experiences throughout their instructional years.

Myth 3: Storybook Reading Is Sufficient for Oral Vocabulary Development

Reading books aloud to children is a powerful and motivating source for vocabulary development.[18] We now have a large corpus of research showing that children learn words through listening to and interacting with storybooks. Nevertheless, recent studies have begun to question whether incidental instruction through book reading may be substantial enough to significantly boost children's oral vocabulary development.[19] Several meta-analyses, for example, have reported only small to moderate effects of book reading on vocabulary development.[20] One group of researchers examined the added benefits of dialogic reading, an interactive reading strategy, on children's vocabulary growth and reported only modest gains for 2- to 3-year-olds.[21] Further, these effects were reduced to negligible levels when children were 4 to 5 years old or when they were at risk for language and literacy impairments.

This means that exposure to words through storybooks is not likely to be potent enough to narrow the substantial gap for children who may be at risk for reading difficulties. Rather, to improve children's oral vocabulary development, teachers will need to augment the read-aloud experience with more intentional strategies that require children to process words at deeper levels of understanding.

Myth 4: We Do It All the Time

Most teachers try to consciously engage children in active experiences that involve lots of conversation throughout the day. In the course of a science activity, for example, a teacher may explain a word to help children understand the context. She might pause during the lesson and say, "That's the *predator*. That means he wants to eat the frog," providing a brief explanation that fits the context of the story. Or during a classroom discussion, a teacher might use the word *celebrate* when describing a birthday activity and then explain, "*Celebrate* means to do something fun." These events represent important teachable moments—informal opportunities to engage in word learning, somewhat parallel to the types of language exchanges between parents and their children.

However, over the course of the 20,000 hours parents and children spend together in the home *before* entering school, vocabulary words are likely to be repeated frequently. The problem is, teachers do not have that luxury. In our study of 55 kindergarten classrooms, for example, we found that although teachers provided more than eight of these word explanations per day, they were rarely, if ever, repeated more than once.[22] Further, words selected for teachable moments were different

Children learn words by predicting relationships between objects and sounds.

across classroom settings. Far too predictably, our study reported that children who attended schools in the most severely low-income neighborhoods were likely to hear far fewer explanations, with those explanations offered at lower difficulty levels, than children in middle- and upper-income areas.

With the implementation of the CCSS, children will be expected to understand content-related words in science and history. This means that we cannot rely on teachable moments alone to help children develop word meanings. Rather, we will need to be proactive in selecting words that have greater application to academic texts with increasingly complex concepts.

Children given child-friendly definitions of words or other attributes of words to be learned are more likely to remember them.

Myth 5: Just Follow the Vocabulary Scope and Sequence in a Core Reading Program

Several years ago, researchers examined the prevalence of oral vocabulary instruction in core reading programs at the pre-K level.[23] We found a dearth of instructional guidance for teachers, despite some "mentioning" of words. Since then, we have turned our attention to kindergarten and first-grade materials, focusing on the four most commonly used core curricula, to examine the breadth and depth of oral vocabulary instruction—the pedagogical features of instruction and how these features might align with research-based evidence on vocabulary development.

Despite greater attention to words in elementary curricula, our results indicated tremendous disparity across curricula.[24] For example, one curriculum listed an average of 20 target vocabulary words per week to be taught, whereas another listed, on average, only two. Further, the criteria used to select words to teach remained a mystery. In one curriculum, words were selected based on the weekly stories. In other curricula, we could find no organizing principle for the selection of words at all. Finally, using three different criteria, we found that many of the vocabulary words selected for instruction were far too easy to warrant school-based instruction.

This means that until such materials are developed, teachers are going to have to rely on a set of research-based principles to ensure that all students receive the quality of oral vocabulary instruction they need. In the age of the CCSS, students will need a specialized language—some describe it as academic language—to convey their ideas, which will facilitate the development of more complex concepts in multiple disciplines. And our efforts to enhance the ability of all children to communicate in academic language and academic thinking through oral vocabulary development must begin early.

Principles of Effective Oral Vocabulary Instruction

Although there is certainly more to learn, we now have a growing research consensus about the characteristics of effective vocabulary instruction. Using evidence from our two recent meta-analyses synthesizing research from 75 vocabulary studies,[25] as well as our own studies examining some of the mechanisms for word learning,[26] five principles emerge to enhance oral vocabulary development, as described below.

Principle 1: Children Need Both Explicit and Implicit Instruction

Children benefit from explicit instruction. That is, children who are given child-friendly definitions of words or other attributes of the words to be learned are more likely to remember them. Prior to the beginning of a story, for example, a teacher might begin by introducing several words that are integral to the story. The teacher might encourage children to listen for each of the "magic words" during the story reading and to raise their hands whenever they hear one.[27] Then the teacher might say to students, "Oh, good. Some of you raised your hands! What word did you hear? Yes, the word *peculiar*. When Anansi said the word *seven*, a peculiar thing happened. *Peculiar* means strange or different."

Our syntheses of research reported that vocabulary gains were significantly higher when words were identified explicitly rather than implicitly (e.g., learning words by listening to a story). However, here's something to keep in mind: the largest gains were made when teachers provided *both* explicit and implicit instruction. One study, for example, found that engaging children in acting out words after explicitly defining them enhanced word learning as measured by standardized assessments later on.[28] In other words, when teachers made children aware of the meaning of the words and then engaged them in using those words in a meaningful context, children achieved greater gains than from explicit instruction alone.

Principle 2: Be Intentional in Word Selection

Given that there are only so many words we can teach—for example, one estimate is a total of about 400 words in a year—we must carefully select the words that we plan to teach. Some have argued that words for vocabulary instruction should be selected from high-utility sophisticated words (known as Tier 2 words) that are characteristic of written language.[29] For example, instead of using the words *keep going*, you can use a Tier 2 word such as

maintain; instead of the word *lucky,* you might use the word *fortunate*. These words are domain general and are likely to relate to more refined labels for concepts that may enhance children's verbal functioning. Studies of "Text Talk," a strategy used to engage children in rich language instruction, have shown impressive results with kindergarten and first-grade children, demonstrating vocabulary gains about twice as large as those resulting from read-aloud studies.[30] Given this research-based evidence, the CCSS have adopted this heuristic for selecting words to teach.

However, our research suggests that it's also important to consider content-related words very early on. These are words that will be critical for developing knowledge in key subject areas. For example, vocabulary related to living things, such as *habitat*, *organism*, and *protection*, can help children talk about and learn about key science-related concepts; moreover, science vocabulary words such as *compare*, *contrast*, *observe*, and *predict* are fundamental inquiry words used not only in science but in all subject areas. In our research, we found that Head Start preschoolers are highly capable of learning and retaining these and similar words over time. Introducing students to content-related vocabulary, therefore, helps them to build word knowledge and concepts essential for developing knowledge systematically from texts.

Principle 3: Build Word Meaning through Knowledge Networks

It's fair to say that words represent the tip of the iceberg; underlying them is a set of emerging interconnections and concepts that these words represent. It is the rich network of concepts and facts accompanying these words that drives children's comprehension.[31] Thus, helping children to learn about words in clusters that represent knowledge networks has been shown to strongly support children's inferential reasoning and comprehension. For example, if you know the word *oar*, you probably also know something about rowboats and paddling. Teaching words in categories, such as "healthy foods" (e.g., *fruit*, *vegetable*, *protein*), also aids in the retention of these words.

Recent evidence for the support of teaching words in knowledge networks comes from two large-scale studies of vocabulary interventions for low-income preschoolers. One study, for example, used a number of useful strategies to help children share semantic similarities between words.[32] Strategies such as encouraging children to look at two picture cards with words on them and make inferences about how these words work together helped them make comparisons of concepts. In our World of Words curriculum, we teach words related to a semantic category. For example, children learn words associated with "parts of the body," such as *abdomen*, *lungs*, *heart*, and *brain*, while focusing on the common features of the category (e.g., "parts of the body" means these are attached to the body).[33] We then engage children in playful activities called "time for a challenge" and ask them questions such as, "Are eyeglasses part of the body?" or "Is hair part of the body?" (Some children argue that hair is not part of the body because their daddies are bald!)

We found that clustering words within categories facilitated children's comprehension and provided promising evidence of accelerating word learning. For example, we showed a picture of a word not taught—in this case, *ankle*—and asked, "Is an ankle a part of the body?" Children who received instruction reported, "Yes, because it helps you walk," whereas a comparison child not receiving instruction just said, "Yes, 'cause." Similarly, children who received our vocabulary curriculum were able to apply their categorical information to new words, suggesting that they were using the semantic information about categories to make inferences and generalizations. Finally, helping children understand how words build knowledge networks facilitates our ability to make teaching them more meaningful. This represents a far cry from our analysis of vocabulary in core curricula in which a teacher might be guided to teach the words *platypus* and *around* on the same day.[34] Rather, children learn best when words are presented in integrated contexts that make sense to them. A set of words connected to a category such as "energy" can help children remember not only the words themselves but the linkages in meaning between them.

There are only so many words we can teach each year, so we must carefully select the words that we plan to teach.

Principle 4: Children Need Repeated Exposure to Gain Vocabulary

Children are most likely to learn the words they hear the most. Findings from a large number of correlational studies on language have shown that frequency of exposure strongly predicts word learning and seems to have long-range consequences for later language and reading levels.[35] Although this finding is often mentioned in the literature, what is new is that we may have underestimated the frequency required to learn words. For example, in attempting to better understand how many repetitions might be needed to learn a novel word, researchers studied 60 4-year-olds during a word-learning task.[36] First, the researchers identified a pseudo-word (e.g., *toma*) for the children, and then they engaged in playing a game involving the word, followed

by a brief assessment. For each word, 12 children heard the new word repeated three times; another 12 children heard the word repeated six times; and so forth, for nine, 18, and 24 repetitions. Only 20 percent of the children who heard a new word three times remembered it; in fact, it wasn't until after *24 repetitions* that the majority of children (80 percent) successfully remembered the word.

The point, of course, is not that all words need 24 repetitions. However, this research does suggest that children need many more encounters with new words than we may have previously suspected. Strategies such as repeated reading have been shown to be effective in helping children acquire new words. In addition, children may benefit from rich explanations of newly encountered words. Rich explanations often include as much information as possible about the new word, including information conveyed through defining, providing synonyms, pointing to illustrations, and using the words in other contexts. These explanations can also give teachers further opportunities to repeat new words, thereby providing children with additional exposures. Another way to build repetition actually goes back to our previous point of teaching knowledge networks. Categories and semantic clusters provide a built-in mechanism for repeating words in meaningful contexts.

Frequency of exposure in a variety of meaningful contexts over an extended period of time enhances word learning.

At the same time, it is also important for teachers to expose children to additional contexts in which the word might be used. Two researchers, in their work with second language learners, suggest that multimedia can be highly effective for enhancing the meanings of words.[37] Their research showed that multimedia-enhanced instruction significantly narrowed the gap between English language learners and non-ELL children in knowledge of targeted words. They found that video could help children learn by representing words in more than one media format, clarifying the instructional dialogue and adding more information to make sense of words that they are learning. Our research, as well, has shown that the addition of dynamic visuals and sounds in video accompanied by informational books provides children with multiple strategies for acquiring word knowledge. Together, this research highlights that frequency of exposure in a variety of meaningful contexts over an extended period of time enhances word learning. Further, children may continue to benefit from additional exposures to a word and its meaning even if they appear to already understand the word.

Principle 5: Ongoing Professional Development Is Essential

The results of our meta-analyses suggest that children's oral vocabulary development is highly malleable and can be significantly improved through intervention. However, these analyses also showed that teachers who have not received adequate preparation and teachers with limited educational backgrounds were not as effective in helping children make significant gains in vocabulary. Similar findings have been reported in other meta-analyses.[38] This research highlights the importance of ongoing professional development for teachers and other school staff who regularly work with children who might need additional instruction.

Very recently, we have drawn from our work with young children the notion of an instructional regime as part of a teacher's ongoing work in the classroom. This pattern of instruction involves several key steps:

- Identifying words that need to be taught;
- Defining these words in a child-friendly way;
- Contextualizing words into varied and meaningful formats;
- Reviewing words to ensure sustainability over time; and
- Monitoring children's progress and reteaching if necessary.

This instructional regime, applied at any grade level, promotes greater attention to the depth of processing words and their meanings, and can provide a critical road map for the future planning of instruction.

Taken collectively, the five principles of oral vocabulary development, in effect, highlight an approach that is designed to help children unlock the complexities of texts that we see throughout the CCSS. Given that these standards place greater emphasis on students' abilities to build arguments from evidence in texts, these instructional principles will give them the tools to engage in academically enriching conversations that can be fulfilling and highly rewarding.

Common myths are often based on some partial truths that have since been debunked or at least shown to have serious flaws

Recent evidence indicates that children need planned, sequenced, and systematic vocabulary instruction.

in their logic. This is the case with oral vocabulary development. In the past, we have often described young children as "word wizards," "word sponges," "lexical vacuum cleaners"—all denoting the supposedly easy process of vocabulary development. Too often, it has been assumed that word learning is natural and that the conditions in classrooms provide spontaneous opportunities for vocabulary development.

Teachable moments are important; however, they will not be sufficient for students to engage in complex texts. Rather, we will have to be much more strategic about word learning than our previous standards or instructional guidelines have acknowledged. Recent evidence indicates that children need planned, sequenced, and systematic vocabulary instruction. This means selecting words, concepts, and ideas that matter most to children right from the very beginning of schooling. Many children from high-poverty circumstances will have had fewer experiences with the academic language that the standards require. Children who enter school in these situations will need skillfully developed instruction that not only improves their word knowledge and concepts, but actually accelerates their vocabulary development, maximizing the limited time they have in school. ☐

Endnotes

1. See, for example, Isabel L. Beck and Margaret G. McKeown, "Increasing Young Low-Income Children's Oral Vocabulary Repertoires through Rich and Focused Instruction," *Elementary School Journal* 107 (2007): 251–271; and Keith E. Stanovich and Anne E. Cunningham, "Studying the Consequences of Literacy within a Literate Society: The Cognitive Correlates of Print Exposure," *Memory & Cognition* 20 (1992): 51–68.

2. Eileen T. Rodriguez and Catherine S. Tamis-LeMonda, "Trajectories of the Home Learning Environment across the First 5 Years: Associations with Children's Vocabulary and Literacy Skills at Prekindergarten," *Child Development* 82 (2011): 1058–1075.

3. Michael F. Graves, *The Vocabulary Book: Teaching and Instruction* (New York: Teachers College Press, 2006).

4. George Farkas and Kurt Beron, "The Detailed Age Trajectory of Oral Vocabulary Knowledge: Differences by Class and Race," *Social Science Research* 33 (2004): 464–497.

5. Dorothy V. M. Bishop and Catherine Adams, "A Prospective Study of the Relationship between Specific Language Impairment, Phonological Disorders and Reading Retardation," *Journal of Child Psychology and Psychiatry* 31 (1990): 1027–1050.

6. Suzanne E. Mol and Susan B. Neuman, "Sharing Information Books with Kindergartners: The Role of Parents' Extra-textual Talk and Socioeconomic Status," *Early Childhood Research Quarterly* (forthcoming), published electronically April 30, 2014, doi:10.1016/j.ecresq.2014.04.001.

7. Amy M. Elleman, Endia J. Lindo, Paul Morphy, and Donald L. Compton, "The Impact of Vocabulary Instruction on Passage-Level Comprehension of School-Age Children: A Meta-Analysis," *Journal of Research on Educational Effectiveness* 2 (2009): 1–44.

8. Jerome S. Bruner, Rose Olver, and Patricia Greenfield, *Studies in Cognitive Growth* (New York: Wiley, 1966).

9. Susan Carey and Elsa Bartlett, "Acquiring a Single New Word," *Papers and Reports on Child Language Development* 15 (1978): 17–29.

10. Paul Bloom, *How Children Learn the Meanings of Words* (Cambirdge, MA: MIT Press, 2000).

11. William E. Nagy, Richard C. Anderson, and Patricia A. Herman, "Learning Word Meanings from Context during Normal Reading," *American Educational Research Journal* 24 (1987): 237–270.

12. Mabel Rice, *Cognition to Language: Categories, Word Meanings, and Training* (Baltimore: University Park Press, 1980).

13. Andrew Biemiller and Catherine Boote, "An Effective Method for Building Meaning Vocabulary in Primary Grades," *Journal of Educational Psychology* 98 (2006): 44–62.

14. Alison Gopnik, Andrew N. Meltzoff, and Patricia K. Kuhl, *The Scientist in the Crib: Minds, Brains, and How Children Learn* (New York: William Morrow, 1999).

15. Bob McMurray, "Defusing the Childhood Vocabulary Explosion," *Science* 317, no. 5838 (August 3, 2007): 631.

16. William E. Nagy and Judith A. Scott, "Vocabulary Processes," in *Handbook of Reaching Research*, vol. 3, ed. Michael L. Kamil, Peter B. Mosenthal, P. David Pearson, and Rebecca Barr (Mahwah, NJ: L. Erlbaum Associates, 2000), 269–284.

17. E. D. Hirsch Jr., "Reading Comprehension Requires Knowledge—of Words and the World," *American Educator* 27, no. 1 (Spring 2003): 10–29, 48.

18. Adriana G. Bus and Marinus H. van Ijzendoorn, "Mothers Reading to Their 3-Year-Olds: The Role of Mother-Child Attachment Security in Becoming Literate," *Reading Research Quarterly* 30 (1995): 998–1015.

19. Connie Juel, Gina Biancarosa, David Coker, and Rebecca Deffes, "Walking with Rosie: A Cautionary Tale of Early Reading Instruction," *Educational Leadership* 60, no. 7 (April 2003): 12–18.

20. Suzanne E. Mol, Adriana G. Bus, and Maria T. de Jong, "Interactive Book Reading in Early Education: A Tool to Stimulate Print Knowledge as Well as Oral Language," *Review of Educational Research* 79 (2009): 979–1007; Suzanne E. Mol, Adriana G. Bus, Maria T. de Jong, and Daisy J. H. Smeets, "Added Value of Dialogic Parent-Child Book Readings: A Meta-Analysis," *Early Education and Development* 19 (2008): 7–26; and National Early Literacy Panel, *Developing Early Literacy: Report of the National Early Literacy Panel* (Washington, DC: National Institute for Literacy, 2008).

21. Mol et al., "Added Value of Dialogic Parent-Child Book Readings."

22. Tanya S. Wright and Susan B. Neuman, "Paucity and Disparity in Kindergarten Oral Vocabulary Instruction," *Journal of Literacy Research* (forthcoming).

23. Susan B. Neuman and Julie Dwyer, "Missing in Action: Vocabulary Instruction in Pre-K," *Reading Teacher* 62 (2009): 384–392.

24. Tanya S. Wright and Susan B. Neuman, "Vocabulary Instruction in Commonly Used Kindergarten Core Reading Curricula," *Elementary School Journal* 113 (2013): 386–408.

25. Loren M. Marulis and Susan B. Neuman, "The Effects of Vocabulary Intervention on Young Children's Word Learning: A Meta-Analysis," *Review of Educational Research* 80 (2010): 300–335; and Loren M. Marulis and Susan B. Neuman, "How Vocabulary Interventions Affect Young Children at Risk: A Meta-Analytic Review," *Journal of Research on Educational Effectiveness* 6 (2013): 223–262.

26. Tanya Kaefer and Susan B. Neuman, "A Bi-Directional Relationship between Conceptual Organization and Word Learning" (paper presented at the annual meeting of the Literacy Research Association, Jacksonville, FL, November–December 2011).

27. Michael D. Coyne, D. Betsy McCoach, and Sharon Kapp, "Vocabulary Intervention for Kindergarten Students: Comparing Extended Instruction to Embedded Instruction and Incidental Exposure," *Learning Disability Quarterly* 30 (2007): 74–88.

28. Rebecca Silverman, "A Comparison of Three Methods of Vocabulary Instruction during Read-Alouds in Kindergarten," *Elementary School Journal* 108 (2007): 97–113.

29. Beck and McKeown, "Increasing Young Low-Income Children's Oral Vocabulary."

30. Isabel L. Beck, Margaret G. McKeown, and Linda Kucan, *Bringing Words to Life: Robust Vocabulary Instruction* (New York: Guilford, 2002).

31. Steven A. Stahl and William E. Nagy, *Teaching Word Meanings* (Mahwah, NJ: L. Erlbaum Associates, 2006).

32. Sharolyn D. Pollard-Durodola, Jorge E. Gonzalez, Deborah C. Simmons, Matthew J. Davis, Leslie Simmons, and Miranda Nava-Walichowski, "Using Knowledge Networks to Develop Preschoolers' Content Vocabulary," *Reading Teacher* 65 (2011): 265–274.

33. Susan B. Neuman, Julie Dwyer, Serene Koh, and Tanya S. Wright, *The World of Words: A Vocabulary Intervention for Preschool Children* (Ann Arbor: University of Michigan, 2007).

34. Wright and Neuman, "Vocabulary Instruction."

35. Justin Harris, Roberta Michnick Golinkoff, and Kathy Hirsh-Pasek, "Lessons from the Crib for the Classroom: How Children Really Learn Vocabulary," in *Handbook of Early Literacy Research*, vol. 3, ed. David K. Dickinson and Susan B. Neuman (New York: Guilford, 2011), 49–65.

36. Ashley M. Pinkham, Susan B. Neuman, and Angeline S. Lillard, "You Can Say That Again! Preschoolers Need Repeated Exposures to Gain Expressive Vocabulary" (paper presented at the annual meeting of the Literacy Research Association, Jacksonville, FL, November–December 2011).

37. Rebecca Silverman and Sara Hines, "The Effects of Multimedia-Enhanced Instruction on the Vocabulary of English-Language Learners and Non-English-Language Learners in Pre-Kindergarten through Second Grade," *Journal of Educational Psychology* 101 (2009): 305–314.

38. Mol et al., "Added Value of Dialogic Parent-Child Book Readings."

Evidence of Student Learning

In the past six years, we have had opportunities to test our approach to vocabulary learning in many different settings, and with children who come from low-income communities, many of whom are English language learners. Here, we highlight some of what we've learned, and why it is so important to focus on content-rich instruction.

In all, we have studied vocabulary learning with more than 2,000 children. We've conducted design studies in an attempt to understand the active ingredients of high-quality instruction, as well as randomized controlled trials examining the impact of interventions. We've looked at vocabulary learning in the home and in school, and the environmental supports that are typical for young children. From these studies, we can summarize the following points:

- Children from low-socioeconomic circumstances are not receiving the type of language supports they will need to achieve the standards in the Common Core—in the home or in school. Children who have limited opportunities for academic language learning in the home most often go to schools with similar limited opportunities.*
- Early literacy instruction in many classrooms in low-income communities has been reduced to the basic skills of learning letters and sounds, with very limited time devoted to content instruction. With little time devoted to science and social studies, children will not develop the background skills needed for comprehending text.
- Despite calls for increasing the amount of informational text reading, little time is spent on it in classroom instruction.
- English language learners often go unnoticed and are not receiving the language supports early on in school that they will need to become successful.†

Together, these findings suggest that if we do not provide more targeted instruction in vocabulary in ways that help children build knowledge networks, children are likely to struggle to meet those Common Core standards that emphasize the importance of integrating knowledge and ideas in texts, making arguments based on evidence, and analyzing similarities and differences among texts.

To better understand effective vocabulary instruction, we focus on what children are capable of when given the opportunity to learn in content-rich settings. In a randomized controlled experiment (generally considered the "gold standard" of research), we examined how a yearlong program of content-rich instruction might compare with the typical day-to-day curriculum in 24 Head Start classrooms in a high-poverty urban area severely affected by the recent economic recession. Classrooms were evenly divided into treatment and control groups, with the treatment group participating in a 12-minute, four-day-per-week program of content-rich vocabulary instruction.

However, in addition to this traditional experimental design, we raised another question. We reasoned that it was not simply enough to compare two similar groups of students; rather, we needed to understand if content-rich instruction might "level the playing field" by helping low-income and language-minority children reach the same standards and skills that middle- and upper-middle-income children have when they enter school. In other words, could high-quality vocabulary instruction early on improve the odds that children would come to school with the vocabulary and conceptual skills that are essential to ensure they are ready to learn?

To answer this question, we measured children's progress from two additional groups: a sample of middle-class children in a state-related preschool program and a sample of children from a university-based program, where more than half the children's parents were PhD students or faculty. In total, we measured more than 1,200 3- and 4-year-old children's progress in vocabulary and conceptual knowledge over a year's time. In addition, we then came back half a year later to see if the gains were sustained.

*See Tanya S. Wright and Susan B. Neuman, "Vocabulary Instruction in Commonly Used Kindergarten Core Reading Curricula," *Elementary School Journal* 113 (2013): 386–408.

†For more on instructional supports for young English language learners, see "Dual Language Learners: Effective Instruction in Early Childhood," in the Summer 2013 issue of *American Educator*, available at www.aft.org/pdfs/americaneducator/summer2013/Goldenberg_Hicks_Lit.pdf.

FIGURE 1:
Growth in Children's Vocabulary

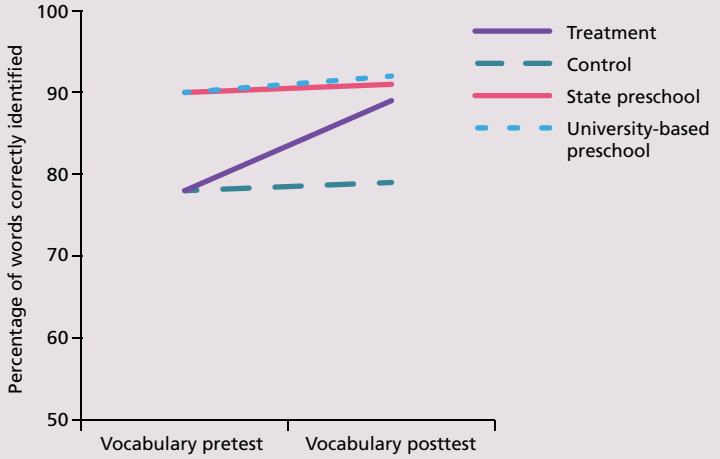
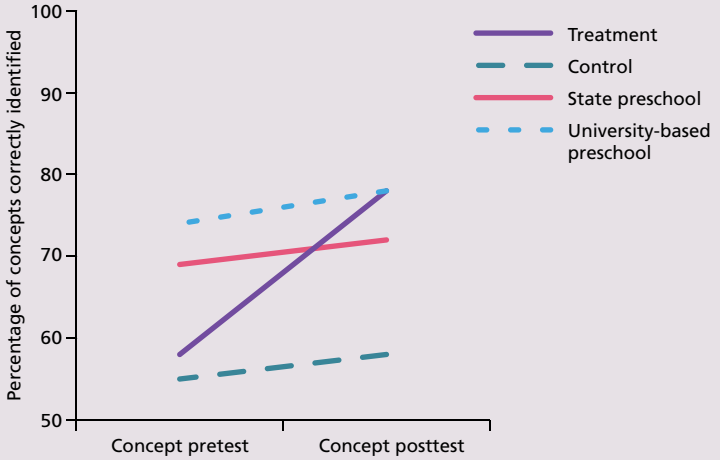


FIGURE 2:
Growth in Children's Conceptual Knowledge



Using assessments designed to measure young children's growth in vocabulary and content knowledge, Figure 1 tells a compelling story. It shows that, by the middle of the year, we began to see dramatic gains for children in the treatment group compared with those of the control group, which remained rather stable. More interesting, however, was that as the words got harder, the children did better, so that by the end of the year, there was no statistical difference between the treatment children and the middle- and upper-middle-class children.

Now let's take a look at children's conceptual development. This is an area that is often not considered in the early years, yet it is central to children's developing comprehension. As Figure 2 shows, the scores of the Head Start treatment group even exceeded those of the middle-class children by midyear, and were statistically on par with the upper-middle-class children at both the middle and the end of the year. In other words, children in the treatment group were engaged in using similar abstract language skills and concepts that their more economically advantaged peers were using as these children were about to enter kindergarten.

When we looked at the differences between native English speakers and second language learners, we found some interesting and very relevant results. Our assessments indicated significant growth in vocabulary and conceptual knowledge for both native and second language learners, as Figure 3 shows. However, for those in the control group, their understandings of conceptual categories throughout the year actually went *down*. These findings suggest that in settings where the language is not comprehensible and no effort is made to help these children learn concepts, second language learners' growth in concepts is stymied.

Finally, we were curious about transfer: whether children who develop conceptual knowledge in some topics can apply their understanding to an entirely new topic. In particular, we were interested in whether our content-rich instruction supported children's *self-learning*. In this extension task, children were introduced to six unfamiliar objects, half of which were tested with a category-related property (e.g., "Can you use a backhoe to make things?"), while the remaining objects were tested using an unrelated property (e.g., "Can you use a backhoe to count?"). Children completed three steps for each of the six unfamiliar objects. First, they were asked to identify the target object from a set of three pictures; this step helped ensure that the object was, in fact, unfamiliar. Children were next told the name of the target object and its category membership (e.g., "This is a vise. It's a tool."). Third, children were asked whether the object possessed certain category properties (e.g., "Can you use a vise to make things?").

As Figure 4 shows, we found that the children in our treatment group were significantly more able to make connections to concepts and to extend their learning to a topic that they were less familiar with. In other words, good-quality instruction, structured in a way that allows children to begin to make knowledge networks, helps them think more conceptually. In this example, children were able to use their existing knowledge for self-teaching purposes. Children's conceptual knowledge appeared to bootstrap their ability to (1) determine the meaning of unfamiliar words, and (2) figure out how these unfamiliar objects related to a larger category. Consequently, with this type of targeted instruction, these children not only made educationally meaningful gains, they achieved at levels consistent with those of more economically advantaged children. This suggests, quite simply, that we have just begun to tap these children's potential.

–S.B.N. and T.S.W.

We must provide more targeted instruction in vocabulary in ways that help children build knowledge networks.

FIGURE 3:
Overall Growth in Vocabulary and Conceptual Knowledge

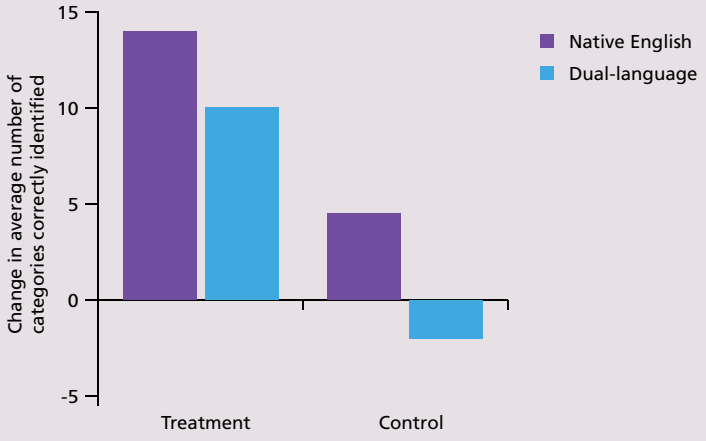
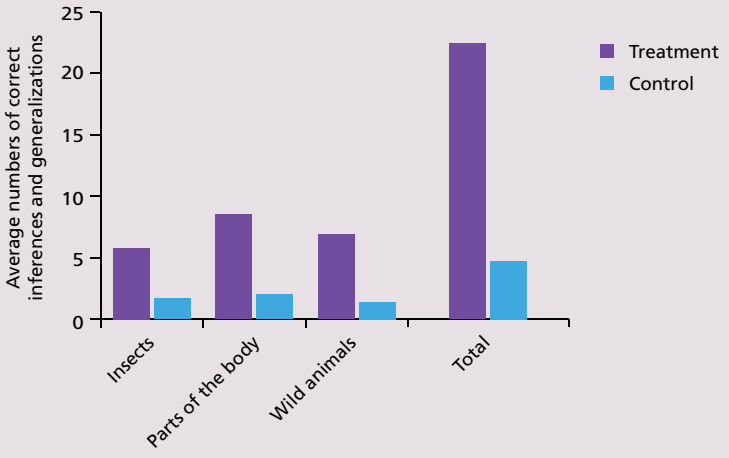
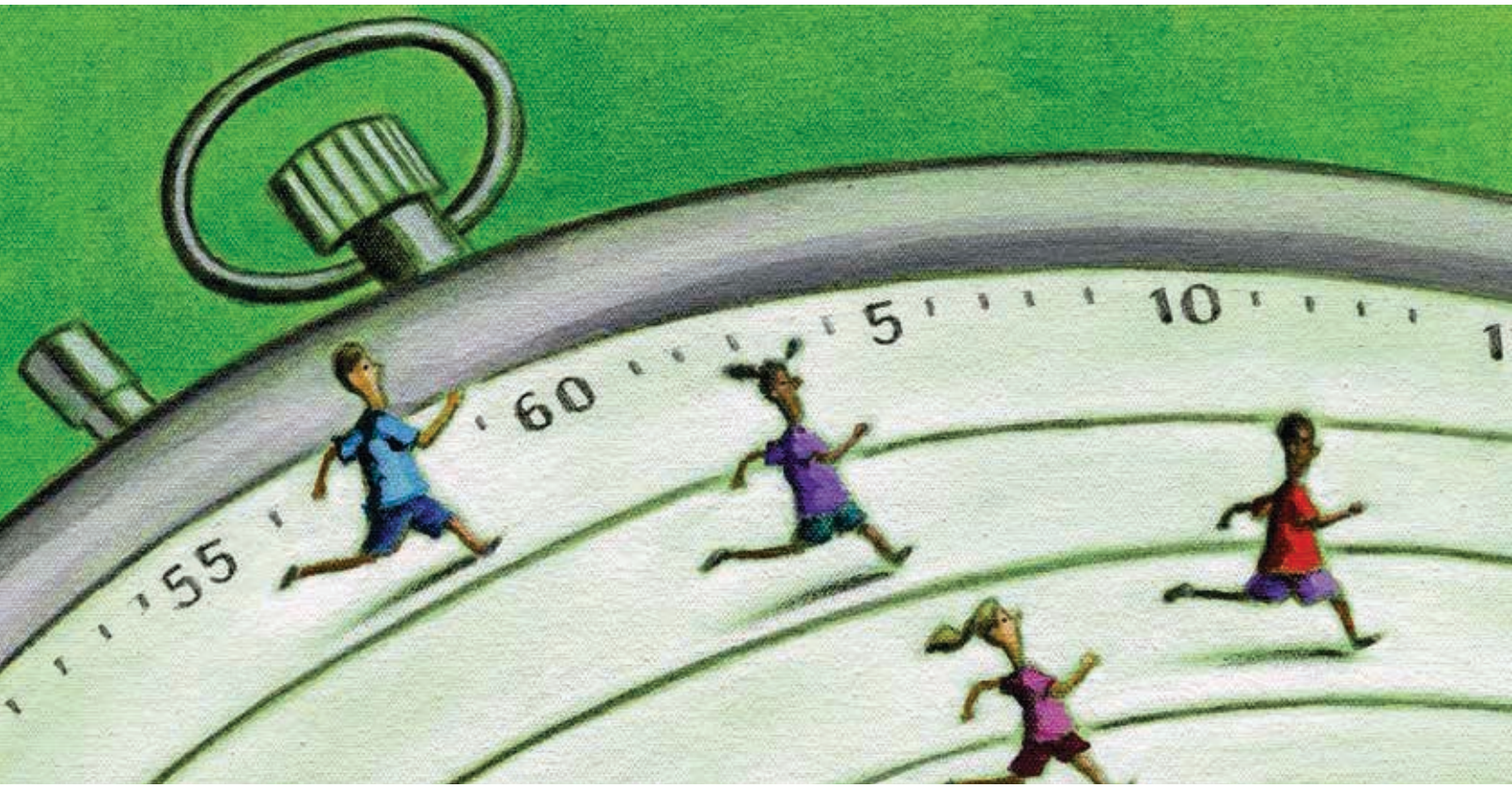


FIGURE 4:
Children's Ability to Transfer Categorical Knowledge to New Words



Starting Off Strong

The Importance of Early Learning



By Chrys Dougherty

As our nation strives to have all students graduate from high school ready for college and other postsecondary learning opportunities, we have to confront the reality that we are far from achieving this goal. The problem is most severe with economically disadvantaged students. For example, in states where all 11th-graders take the ACT test, only 45 percent of low-income students in 2012 met the ACT College Readiness Benchmarks in English, 30 percent in reading, 21 percent in mathematics, and 13 percent in science.[1]

For many students, especially those from disadvantaged backgrounds, learning gaps appear in early childhood.[2] Large numbers of disadvantaged students enter kindergarten behind in early reading and mathematics skills, oral language development, vocabulary, and general knowledge. This situation poses a challenge for intervention models that presume that 15 percent or so of students need short-term additional help, 5 percent or so need long-term intervention, and the regular academic program will take care of the rest.[3] In cases where the great majority of students are academically behind and need major assistance, the regular academic program must be upgraded to deliver a richer curriculum to all students. Such a curriculum is highly beneficial for all students, but is especially critical for disadvantaged students, who often arrive from home with limited knowledge and vocabulary. School districts must develop a system of practices that enable such a curriculum to be taught effectively.[4]

Why Early Learning Is Important

That learning gaps emerge early, particularly among disadvantaged students, is one of the better-documented facts in education.[5] Students who do not have a good start usually do not thrive later on. That is not only due to the fact that students in stressful environments with limited learning opportunities often remain in those environments, but also because early learning itself facilitates later learning—students who already know more about a topic often have an easier time learning additional information

Chrys Dougherty is a senior research scientist at ACT Inc., where he writes about college readiness and the value of longitudinal student data and statewide student information systems. A former elementary school teacher, he is the author of Asking the Right Questions about Schools: A Parents' Guide *(2002).* *This article first appeared as an ACT policy report,* College and Career Readiness: The Importance of Early Learning *(2013), and is reprinted with permission of ACT Inc. The original report can be downloaded at http://act.org/research/policymakers/pdf/ImportanceofEarlyLearning.pdf. Permission requests for further reprints in other publications may be sent to ACT at publications@act.org.*

ILLUSTRATIONS BY PAUL ZWOLAK

on the same topic, and early exposure to knowledge can stimulate students to want to learn more.[6]

Getting students off to a good start in preschool and the elementary grades is vitally important for several reasons:

Learning takes time. Research studies have addressed the value of allowing sufficient time per topic for students to adequately master the topic.[7] This implies that subject-matter learning should be spread out over many years to permit a range of topics to be addressed in adequate depth. For example, one well-known curriculum for the elementary and middle grades spreads out the study of U.S. history over all of those grades, covering fewer topics in greater depth in each grade.[8]

Learning is cumulative. In a well-designed curriculum, learning in the upper grades builds on prior learning in the lower grades.[9] This is most obvious in the case of mathematics, but is also true for other content areas such as science, history, geography, literature, and the arts. For example, students learning about glucose metabolism in high school biology classes benefit from having learned the necessary prior chemistry knowledge in elementary and middle school.

Student interests often develop at an early age. Students with the good fortune to be exposed to rich content in science, history, and other subjects at a young age may develop an interest in those subjects. Interest, in turn, leads to greater learning.[10] Disadvantaged students often depend on their schools for this exposure, since their access to content outside of school may be limited. Simply having the content available in libraries and on the Internet is not enough, because children need adults to guide them to the content and help them understand it.[11]

Empirical evidence shows the difficulty of catching students up in middle and high school. Several studies have explored the importance of preparation prior to eighth grade for students to have a reasonable chance of meeting college readiness benchmarks by the end of high school.[12] For example, students who were far off track in eighth grade had only a 10 percent chance in reading, 6 percent chance in science, and 3 percent chance in mathematics of reaching ACT's College Readiness Benchmarks by 12th grade. In higher poverty schools, those numbers were 6 percent, 3 percent, and 3 percent, respectively.[13] Results were similar for students catching up between fourth and eighth grade.[14] The harder it is to get off-track students on track in the upper grades, the more important it is to get them on track in the early grades.

Strengthening Early Learning

What kinds of learning are important to emphasize in the early years? The following are components of a strong preschool and elementary school education.

A strong start in reading (decoding) and mathematics. Educators have long emphasized the importance of learning to read well in the early grades, a belief supported by longitudinal research.[15] Reading consists of two abilities: the ability to identify the words on the page (decoding), and the ability to understand the words once they are identified (comprehension). Decoding is the main constraint on reading ability for beginning readers. Fluent decoding depends on mastering letter-sound relationships and becoming familiar with spelling patterns in the English language. Ensuring that students learn to decode well depends, among other things, on using activities and methods in preschool, kindergarten, and first grade that develop children's phonological (sound) awareness and their knowledge of the relationship between letters and sounds.[16] Meanwhile, children's comprehension can be developed in the early grades by reading aloud to them from books that develop their knowledge and vocabulary.

In mathematics, the ability to do simple arithmetic and place numbers on the number line by first grade predicts mathematics performance in fifth grade.[17] Engaging preschool and kindergarten students in games that involve number comparisons, counting, and adding can help prevent mathematics difficulties from emerging in the early elementary grades.[18]

That learning gaps emerge early, particularly among disadvantaged students, is one of the better-documented facts in education.

A content-rich curriculum. A large part of the achievement gap between advantaged and disadvantaged students may be due to greater vocabulary and content learning by students in advantaged home environments.[19] One study found that kindergartners' general knowledge of the world was a better predictor of those students' eighth-grade reading ability than were early reading skills.[20] This is consistent with research showing that reading comprehension, particularly in the upper grades, depends heavily on students' vocabulary and background knowledge.[21] To develop this knowledge, students need a curriculum rich in content not only in English language arts and mathematics, but also in science, history, geography, civics, and the arts.[22]

Development of wide vocabulary and background knowledge takes time.[23] This helps to explain why reading gaps don't close quickly, and why programs that have been successful in closing math skills gaps have had greater difficulty closing reading gaps.[24] The time required to develop students' knowledge and vocabulary is one reason why content-rich curriculum should begin in early childhood. Early content learning can also stimulate curiosity and interest in subjects such as science, history, and art. Content knowledge is also important for abstract reasoning—an abundance of concrete examples make reasoning easier.[25]

By contrast, explicit instruction in comprehension strategies such as "finding the main idea" and "questioning the author" makes only a limited contribution to students' reading comprehension.[26] Therefore, instruction in these strategies should not be

allowed to take large amounts of time away from content-area learning.[27] A content-rich curriculum can also enhance the effectiveness of a major comprehension strategy—"activating the student's prior knowledge"—by increasing the amount of prior knowledge possessed by students.

Activities that develop students' academic and social behaviors. Behaviors such as paying attention, completing assignments, persisting in difficult tasks, and regulating one's own actions (thinking before acting) play a large role in students' success in school and later on in life.[28] Educators can lay the foundation for these behaviors in preschool, kindergarten, and first grade through classroom activities that develop children's "executive function"—their ability to direct their own attention and activity.[29] Programs that target specific desired student behaviors and explicitly teach those behaviors through active learning (students act out or practice the behavior, rather than just being told about it) are effective at improving both behavior and academic achievement.[30]

The time required to develop students' knowledge and vocabulary is one reason why content-rich curriculum should begin in early childhood.

Barriers to Strengthening Early Learning

Three important barriers to strengthening the early curriculum may be summarized under the heading of **A-B-C**: accountability system design, beliefs about early learning, and capacity limitations.

Accountability system design. Accountability systems have been designed to create a sense of urgency about improving test scores. However, this has often had the undesirable effect of shortening educators' time horizons so that they emphasize changes aimed at improving accountability ratings over the short run. These changes can include narrowing the curriculum to de-emphasize subjects not tested in the current grade, and spending inordinate amounts of time coaching students on how to answer sample test questions.[31]

By contrast, many steps to improve academic learning and behaviors take time to bear fruit and may not immediately result in higher test scores. For example, implementing an excellent kindergarten and first-grade reading, mathematics, science, social studies, or fine arts program will not immediately affect test results in the later grades. Neither will field trips to science and art museums, nature areas, and historical sites—all of which develop knowledge of the world. Accountability incentives should be modified to recognize efforts that increase student learning over the longer run and promote learning in grades and subject areas not covered on state tests.

Beliefs about early learning. Some educators and policymakers have resisted the introduction of a content-rich curriculum in the early grades because they do not think that it is the right thing to do. Examples of these beliefs include:

- *The belief that content learning will be boring to young children.* Whether content is meaningful and interesting to students depends largely on how it is taught and on whether students have the prior knowledge needed to appreciate the new information.[32] Good teachers present information in a way that appeals to students' experience and imagination, and good curriculum developers pay attention to building necessary prior knowledge before introducing new information. Thus, the concern that content learning will be boring is largely a concern about the capacity of the school system to provide sound curriculum and effective teaching.
- *The belief that young students should mainly learn content close to their everyday experience.* This belief has held sway mainly in social studies, where a popular curricular approach, "Expanding Environments," focuses on students' families in kindergarten and first grade, neighborhoods in second grade, and community in third grade, before expanding to state history in fourth grade and U.S. history in fifth grade.[33] This approach can sacrifice four years of student learning about the larger world outside their own communities.[34]
- *The belief that students can learn everything they need later by looking up information online.* Understanding and evaluating the cacophony of information and opinion on the Internet—or even knowing what to look up—requires prior knowledge of the subject area being addressed.[35] Further, the ability to look things up does not substitute for prior knowledge when people think or make judgments—learning enough to make informed

decisions usually requires sustained study, not just the acquisition of a few isolated pieces of information.[36] Thus, the ready availability of so much information has probably increased the value of early exposure to knowledge.

- *The belief that teaching academic content in science, social studies, and fine arts in the early grades will crowd out essential learning in reading, mathematics, and academic and social behaviors.* One promising approach to avoid this problem is to integrate learning in the other subject areas into the reading and writing program, using read-alouds to expose beginning readers to content knowledge and vocabulary. The approach treats content learning as an essential part of the comprehension strand of reading instruction.[37] A pilot program using this approach was found to outperform conventional approaches to teaching reading.[38]

Capacity limitations. Teachers in the early grades may not be well equipped with training, instructional materials, and ongoing professional support to teach all of the necessary content in their classrooms. Addressing this problem requires school districts to upgrade their systems that support teaching and learning, as discussed in the next section.

Importance of a System to Support Early Learning

Improving teaching and learning in the early grades requires not a flurry of disconnected initiatives, but a sustained, coherent, coordinated effort by district and school leaders to provide the necessary support for improving practices at the classroom level. Educator practices learned from research on effective schools can be grouped under five major themes, described in more detail in the ACT Core Practice Framework.[39]

Curriculum and academic goals. School districts can support their teachers by developing a clear and specific written curriculum that describes what must be taught in each grade and subject, and provides examples of what mastery of each learning objective looks like. Such a curriculum can address the likely amount of time required to teach each topic and the integration of content across subject areas, issues that are especially important in the early grades.

Staff selection, leadership, and capacity building. Teaching a content-rich curriculum across the subject areas places a large premium on teachers' knowledge and skills, especially for those who teach multiple subjects. This requires the careful selection of school and district leaders who can support teachers as they improve these skills, as well as the provision of frequent common planning times built into the school's master schedule, when teachers can discuss their students' learning in an environment of collaboration and trust. Professional development should be carefully chosen to focus on the most critical knowledge and skills needed to teach the district's curriculum in each subject.

Instructional tools: programs and strategies. School and district leaders should carefully pilot and evaluate instructional materials they are considering for purchase to make sure those materials address the learning goals in the district's written curriculum. A similar process based on evaluation, data, and prior research should be used to make decisions about instructional strategies and arrangements—for example, the extent to which teachers in the early grades should specialize in different subjects.

Monitoring performance and progress. Monitoring student learning is vital for helping educators make instructional decisions: to identify which students need extra help; to place students in learning groups or intervention programs; to know which concepts need to be retaught; and to identify which lessons, teaching strategies, or instructional materials are working. This requires schools and districts to use assessments in the early grades that are based on the district's written curriculum. Frequent formative assessment is needed throughout the year in order for teachers to respond quickly to student needs and keep parents informed about how their children are doing.

Intervention and adjustment. School leaders need to work with teacher teams to identify and assist students who need extra help. Timely assessments make it easier to identify those students early when assistance can have the greatest impact. The same logic applies to identifying and assisting teachers and entire schools in need of support. A school district can be said to have a system to improve early learning when changes in any one of these five areas are accompanied by related changes in the other four areas. For example, changes in the district's written curriculum should be accompanied by matching changes in staff development, instructional resources, assessment, and interventions.[40]

Implementing all of the components of a strong early learning program is difficult and requires a sustained districtwide effort to improve teaching and learning in the early grades. Maintaining such an effort requires school leaders and policymakers to promote public awareness of:

1. **The importance of early learning.** Educators and policymakers must help the public understand the reasons why early learning is so important: that later learning builds on early learning; that learning about a sufficiently broad range of topics takes time, and cannot be accomplished exclusively in the later grades; that catching students up from far behind is difficult in the upper grades; and that early learning develops students' interests and intellectual curiosity, influencing whether they become lifelong learners.

2. **The components of a strong early learning program.** These components include a strong early reading and mathematics program; a content-rich curriculum not only in English language arts and mathematics, but also in science, history, geography, civics, and the arts; and activities designed to develop students' academic and social behaviors.

Teachers need common planning times built into the school's master schedule to discuss student learning in an environment of collaboration and trust.

3. **The obstacles to strengthening early learning programs.** These obstacles include accountability incentives that encourage educators to focus on short-term results on a few measures; beliefs that an increased emphasis on early content learning is not desirable or necessary; and limitations in the training and support for educators in the early grades.

4. **The importance of a system to improve early learning.** School districts should focus on steadily improving practices at the district, school, and classroom levels in five areas: (a) curriculum and academic goals; (b) staff selection, leadership, and capacity building; (c) instructional programs and strategies; (d) monitoring performance and progress; and (e) intervention and adjustment. They can use information derived from the study of effective schools, such as that contained in the ACT Core Practice Framework, as a guide to their improvement effort. □

Endnotes

1. Those states were Colorado, Illinois, Kentucky, Michigan, North Dakota, Tennessee, and Wyoming. The data set consisted of the most recent ACT score for each student set to graduate in 2012. For students who retook the ACT their senior year, the scores are from the 2011–2012 school year; otherwise they are from the spring of 2011 when the students were in 11th grade.

2. Betty Hart and Todd R. Risley, *Meaningful Differences in the Everyday Experience of Young American Children* (Baltimore: Paul H. Brookes, 1995).

3. See the description of Response to Intervention models in National Association of State Directors of Special Education (NASDSE) and Council of Administrators of Special Education (CASE), *Response to Intervention: NASDSE and CASE White Paper on RtI* (Washington, DC: National High School Center, 2006).

4. ACT, *The Core Practice Framework: A Guide to Sustained School Improvement* (Iowa City, IA: ACT, 2012); and ACT, *Rising to the Challenge of College and Career Readiness: A Framework for Effective Practices* (Iowa City, IA: ACT, 2012).

5. Hart and Risley, *Meaningful Differences*; Rachel E. Durham, George Farkas, Carol Scheffner Hammer, J. Bruce Tomblin, and Hugh W. Catts, "Kindergarten Oral Language Skill: A Key Variable in the Intergenerational Transmission of Socioeconomic Status," *Research in Social Stratification and Mobility* 25 (2007): 294–305; and Jerry West, Kristin Denton, and Elvira Germino-Hausken, *America's Kindergartners* (Washington, DC: National Center for Education Statistics, 2000).

6. Patricia A. Alexander, Jonna M. Kulikowich, and Sharon K. Schulze, "How Subject-Matter Knowledge Affects Recall and Interest," *American Educational Research Journal* 31 (1994): 313–337; and Daniel T. Willingham, "How Knowledge Helps: It Speeds and Strengthens Reading Comprehension, Learning—and Thinking," *American Educator* 30, no. 1 (Spring 2006): 30–37. The advantages that come from greater initial learning are often referred to as "Matthew effects." Stanovich explains Matthew effects in reading as follows: "The very children who are reading well and who have good vocabularies will read more, learn more word meanings, and hence read even better. Children with inadequate vocabularies—who read slowly and without enjoyment—read less, and as a result have slower development of vocabulary knowledge, which inhibits further growth in reading ability." Keith E. Stanovich, "Matthew Effects in Reading: Some Consequences of Individual Differences in the Acquisition of Literacy," *Reading Research Quarterly* 21 (1986): 360–407, 381.

7. Marc S. Schwartz, Philip M. Sadler, Gerhard Sonnert, and Robert H. Tai, "Depth Versus Breadth: How Content Coverage in High School Science Courses Relates to Later Success in College Science Coursework," *Science Education* 93 (2009): 798–826; and Junlei Li, David Klahr, and Stephanie Siler, "What Lies Beneath the Science Achievement Gap: The Challenges of Aligning Science Instruction with Standards and Tests," *Science Educator* 15, no. 1 (2006): 1–12.

8. Core Knowledge Foundation, "The Core Knowledge Sequence," www.coreknowledge.org/sequence.

9. Willingham, "How Knowledge Helps."

10. Adam V. Maltese and Robert H. Tai, "Eyeballs in the Fridge: Sources of Early Interest in Science," *International Journal of Science Education* 32 (2010): 669–685.

11. Susan B. Neuman and Donna C. Celano, "Worlds Apart: One City, Two Libraries, and Ten Years of Watching Inequality Grow," *American Educator* 36, no. 3 (Fall 2012): 13–23.

12. ACT, *The Forgotten Middle: Ensuring that All Students Are on Target for College and Career Readiness Before High School* (Iowa City, IA: ACT, 2008); ACT, *How Much Growth Toward College Readiness Is Reasonable to Expect in High School?* (Iowa City, IA: ACT, 2010); ACT, *Catching Up to College and Career Readiness* (Iowa City, IA: ACT, 2012); and Chrys Dougherty, *Using the Right Data to Determine if High School Interventions Are Working to Prepare Students for College and Careers* (Washington, DC: National High School Center, 2010).

13. In the study, "far off track" in eighth grade was defined as scoring more than one standard deviation below the ACT College Readiness Benchmark on EXPLORE in the subject in question. ACT, *Catching Up*.

14. ACT, *Catching Up*; and Chrys Dougherty and Steve Fleming, *Getting Students on Track to College and Career Readiness: How Many Catch Up from Far Behind?* (Iowa City, IA: ACT, 2012).

15. Philip E. Kraus, *Yesterday's Children: A Longitudinal Study of Children from Kindergarten into the Adult Years* (New York: John Wiley & Sons, 1973); Dee Norman Lloyd, "Prediction of School Failure from Third-Grade Data," *Educational and Psychological Measurement* 38 (1978): 1193–1200; Connie Juel, *Learning to Read and Write in One Elementary School* (New York: Springer-Verlag, 1994); Anne E. Cunningham and Keith E. Stanovich, "Early Reading Acquisition and Its Relation to Reading Experience and Ability 10 Years Later," *Developmental Psychology* 33 (1997): 934–945; and Donald J. Hernandez, *Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation* (New York: Annie E. Casey Foundation, 2011).

16. Diane McGuinness, *Why Our Children Can't Read, and What We Can Do About It: A Scientific Revolution in Reading* (New York: Free Press, 1997); and National Research Council, *Preventing Reading Difficulties in Young Children* (Washington, DC: National Academies Press, 1998).

17. David C. Geary, "Cognitive Predictors of Achievement Growth in Mathematics: A 5-Year Longitudinal Study," *Developmental Psychology* 47 (2011): 1539–1552.

18. National Research Council, *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity* (Washington, DC: National Academies Press, 2009). In later grades, students must attain fluency with fractions and subsequently with algebra, which they are more likely to do if they have access to a coherent mathematics curriculum and skilled teaching in the elementary and middle school grades. William H. Schmidt and Curtis C. McKnight, *Inequality for All: The Challenge of Unequal Opportunity in American Schools* (New York: Teachers College Press, 2012); Deborah Loewenberg Ball and Francesca M. Forzani, "Building a Common Core for Learning to Teach and Connecting Professional Learning to Practice," *American Educator* 35, no. 2 (Summer 2011): 17–21, 38; and Liping Ma, *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States*, 2nd ed. (New York: Routledge, 2010).

(Continued on page 42)

Taken for Granted

Why Curriculum Content Is Like Oxygen

By Carolyn Gosse and Lisa Hansel

When asked what matters most in life, it's easy to quickly answer family and friends. It's loved ones we care about most, so the answer is appropriate—but is it entirely accurate? Of course not. The precise answer, which no one wants to hear, begins with oxygen.

Life is full of such social conventions. Many are beneficial (at least for easing communication), and most are harmless. But sometimes the "appropriate" answer goes unexamined for too long. Sometimes an accurate answer is needed. We see a parallel situation in discussions of school improvement. Whether in casual conversations or even in serious debates, there seems to be a de facto, appropriate answer as to what matters most in creating a good school: great teachers and supportive parents. Not that these things are unimportant; just like family and friends, they are essential. But is there a more accurate answer, one that, like oxygen, is taken for granted? We contend that there is: the content of the curriculum, the specific knowledge and skills taught each day.

Experience tells us that curriculum is glossed over in different ways by educators and policy leaders.

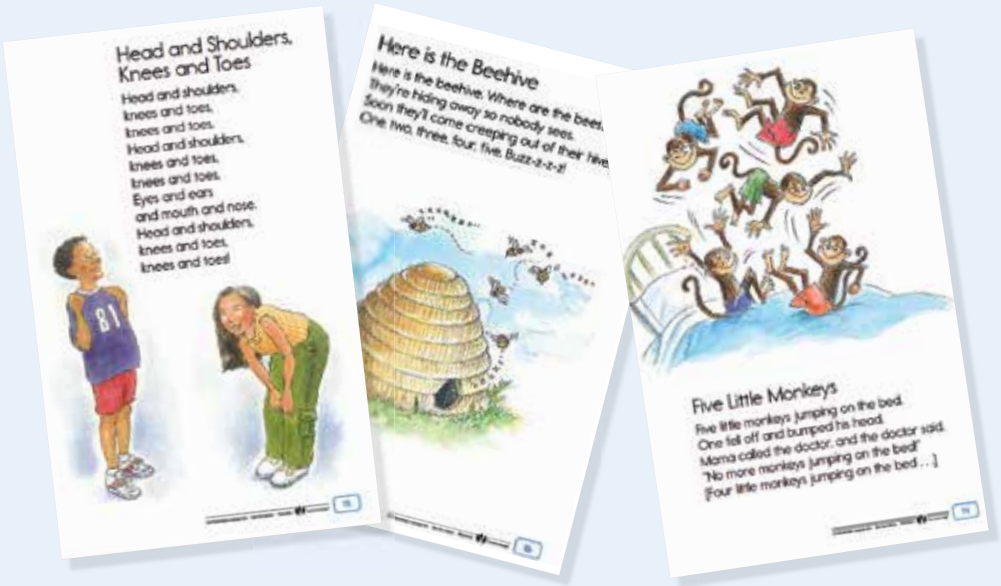
For educators, the content of the curriculum really is like oxygen. Teaching is always about something, and that something has to be specified before any other decisions can be made. That's so obvious that it's assumed, prompting educators to jump to other factors in thinking about what's essential to a great school. Don't get us wrong: the curriculum doesn't make a school great all by itself any more than oxygen alone makes us live. Both are merely necessary preconditions. Yet while it is possible to find a struggling school with a great curriculum, finding a good school with a weak curriculum is about as likely as finding a human being who can live without oxygen. Regrettably, when educators take the content of the curriculum for granted, they lose opportunities to coordinate and collaborate. Students may be learning something valuable in each grade or course, but they do not receive the benefits of a coherent, cumulative, cross-curricular experience.

Many leaders in education policy, on the other hand, seem to have no idea that curriculum matters. Some don't even realize that standards and curricula are not the same thing. Theoretically, we could blame the educators for not explaining to the policy-

All of the images shown within this article come from the Core Knowledge Language Arts Preschool program. The program contains seven units; each unit has its own teacher guide, four of which are shown below.

Carolyn Gosse is the Core Knowledge Foundation's lead developer of CKLA Preschool. She received her PhD in Language and Literacy Development and Disorders from the University of Virginia, where she worked on a research project evaluating the effectiveness of a preschool curriculum designed to enhance young children's language and literacy skills. Lisa Hansel is the communications director for the Core Knowledge Foundation. Previously, she was the editor of American Educator. *Portions of this article are adapted with permission from "What Really Matters Most?" by Lisa Hansel, which was published on the CUNY Institute for Education Policy blog,* IdeaLab, *at http://ciep.hunter.cuny.edu/really-matters.*

makers that curriculum is like oxygen—but in the real world we can't. In an era of "100 percent proficient or else," what sane educators would encourage policymakers to "improve" their oxygen? Teachers realize, after all, that their evaluations are increasingly tied to student scores on high-stakes tests. As a result, they are reluctant—and rightfully so—to invite policymakers to offer what are likely to be similarly flawed suggestions about what the curriculum for each grade level should look like.



These are three of the 56 posters with nursery rhymes and songs that are used throughout the school year.

Unfortunately, the very lack of any discussion about the curriculum virtually ensures that the standards regime cannot attain its goal of raising student proficiency. There is no more direct connection to student achievement—i.e., what students know and can do—than what students have been taught.

It has been nearly five years since Russ Whitehurst of the Brookings Institution wrote "Don't Forget Curriculum,"[1] noting that "policy makers who cut their teeth on policy reforms in the areas of school governance and management rather than classroom practice [are] people who may be oblivious to curriculum for the same reason that Bedouin don't think much about water skiing." Importantly, Whitehurst compared the impact of curricular improvements to that of other reforms, such as charter schools, altering the teacher workforce, preschool, and state standards. Conclusion: "Curriculum effects are large compared to most popular policy levers."

This is why we are drawing attention to the oxygen: it is the necessary precondition for improving schools, closing the achievement gap, engaging parents, and preparing teachers.

Trying again a couple of years ago, Whitehurst and Matthew Chingos published "Choosing Blindly: Instructional Materials, Teacher Effectiveness, and the Common Core."[2] Examining curriculum effects versus teacher effects, they found that implementing a better curriculum can have a slightly greater impact on student learning than teachers whose value-added data puts them at the 75th percentile (as compared with a 50th percentile teacher). While teacher quality is the clear leader in policy discussions of what matters most, these findings indicate that curriculum is just as important as teaching.

Since curriculum matters, everyone ought to act like it matters—and educators should have the opportunity to lead the way. Within schools, educators can work together to adopt, adapt, or create a coherent, grade-by-grade curriculum that maximizes cross-discipline connections and efficiently builds knowledge and skills. Across schools in areas with high student mobility, they can agree to a set of specific knowledge and skills to be taught in each grade; children who change schools will benefit immediately—and so will their teachers.

These are bold claims. They rest only in small part on research, like Whitehurst's, showing the relative power of curriculum. The fact is, there has been nowhere near enough research conducted on curriculum. But lots of relevant research has been done by cognitive scientists on how children learn. It is on this large body of evidence that we build our bold claims.

Child Friendly, Content Rich

As the articles on pages 4 and 14 of this issue explain, several findings have emerged that are critical to early education. For example, knowledge builds on knowledge, so it is essential to begin building broad academic knowledge and vocabulary in the early years. In addition, repeated and varied exposures to concepts and vocabulary are needed for solid understandings to take root in long-term memory. Therefore, the content of instruction should be carefully planned to introduce topics early, and then teachers can intentionally revisit, deepen, and extend learning on these topics in later grades.

For educators in preschool through third grade who don't have the time or support to create such a curriculum, one potential model to adopt or adapt is Core Knowledge Language Arts (CKLA).* The CKLA program envisions reading as a two-lock box—a box that takes two keys to open. One key is knowledge of the code (the sound-letter correspondences), which must be mastered for fluent reading and writing. The other key is knowledge of words and the world, which is essential for language comprehension (both oral and written). Both keys are addressed throughout the program. The first key is developed with a phonics-based approach, as reading and writing skills are taught in tandem. The second key is developed primarily through teacher read-alouds, along with text-based discussions and activities.

While CKLA's skills instruction is absolutely essential, it is not all that different from other research-based phonics pro-

*To learn more about Core Knowledge Language Arts, see "More Than Words: An Early Grades Reading Program Builds Skills and Knowledge," in the Fall 2012 issue of *American Educator*, available at www.aft.org/pdfs/americaneducator/fall2012/dubin.pdf.

grams. What makes CKLA unique is the content-rich read-alouds, in which teachers read texts to students and engage them in conversations about the text and accompanying images. These read-alouds and discussions, which range from 20 to 30 minutes, are organized in 7 to 12 domains per grade. Each domain is dedicated to a particular topic that the class stays focused on for 10–15 days. Domains include "The Five Senses," "Native Americans," "Astronomy," "Early Asian Civilizations," "Insects," and more. The domains are carefully organized to build on each other within and across grades, giving students opportunities to refine and expand their knowledge and vocabulary over time. The topics are interesting and engaging too, as the content goes well beyond standard early grades fare (such as social studies that reviews families and neighborhoods year after year, and science focused on basic information about weather, plants, and animals) to include important historical and scientific events, ideas, and people.

Children in CKLA are immersed in sophisticated content, but it isn't just randomly dropped in. Accessible concepts—like families and communities—are purposefully introduced in preschool and then revisited and extended in later grades—such as the first-grade "Early World Civilizations" domain. Given the complexity and long-ago history of such a topic, some may question whether young children can meaningfully learn about ancient Egypt. The answer is absolutely.

As Daniel T. Willingham explained in these pages several years ago, "*no content is inherently developmentally inappropriate.*"[3] It turns out that Piaget's notion of discrete developmental stages is not correct; young children not only differ from each other, their individual performance will vary from task to task and day to day. If children don't understand a lesson, Willingham encourages teachers to ask why—and to ask if it really matters. Perhaps the children need more background knowledge or a different explanation, not more time to "develop." And perhaps it's just fine for them to start forming a concept, but not grasp each detail:

> For example, suppose your preschool students have learned about Martin Luther King Jr., but you are having a hard time getting them to understand that he was a real person who is no longer here, and that fictional characters such as Mary Poppins are not here and never were. If it's hard for a 4-year-old to conceive of people living in different times and places, does that mean that history should not be taught until the child is older? Such an argument would not make much sense to a developmental psychologist. For children and adults, understanding of any new concept is inevitably incomplete. The preschoolers can still learn something about who King was and what he stood for. Their mistaken belief that they might encounter him at a local store, or that he lives at a school that bears his name, will be corrected in time. Indeed, how do children learn that some people are fictional and some are not? Not by a magical process of brain maturation. Children learn this principle as they learn any other—in fits and starts, sometimes showing that they understand and other times not. *If you wait until you are certain that the children will understand every nuance of a lesson, you will likely wait too long to present it.* If they understand every nuance, you're probably presenting content that they've already learned elsewhere.

Teachers using CKLA have found this to be true: young children enjoy hearing about and discussing complex concepts—and any misconceptions that preschoolers and kindergartners have are cleared up as topics are revisited in grades 1 through 3. According to Jena Peluso, a teacher at P.S. 333 in Queens, New York, students have "responded to the material exceptionally well":[4]

> For example, last year I visited the Museum of Natural History with my first grade students, and as we were walking through the ancient Egyptian exhibit in the museum, the students were amazed that they were getting to see things in person that they were learning about all month. Not only were the students amazed, but other museum goers and tourists were amazed at the rich vocabulary that was coming out of these little six-year-olds' mouths. The students were able to recognize everything from the Sphinx to the sarcophagus, it was truly rewarding as a teacher to see this happening as a result of teaching this rigorous curriculum.

A great curriculum is the necessary precondition for improving schools, closing the achievement gap, engaging parents, and preparing teachers.

This early foundation enables second- and third-graders to really grasp historical and scientific content that has traditionally been reserved for middle school.

For example, at Thomas Jefferson Classical Academy in Forest City, North Carolina, a charter school that serves a rural, predominantly working-class community, Heidi Cole's second-graders eagerly learn 19th- and 20th-century American history:[5]

> With confidence, I can say that I have not only "taught" my students about … the War of 1812, Westward Expansion, and the Civil War, but my students have truly "learned" something about these topics. … My students embrace the stories of hardship faced by slaves in the South. The result is empathy, followed by a desire to learn more, and the hope of a slavery-free world. Hearing the stories of slavery through the eyes of a child such as Minty (Harriet Tubman) helps children make important connections. … Awareness of slavery also helps prepare students with the

> necessary background needed to later understand the Civil Rights domain [at the end of second grade]. … Providing such strong background knowledge at a young age will enable these learners to develop a deep level of understanding about our country's history and its government.

It will indeed. The path to college, career, and citizenship begins in early childhood, so let's take a closer look at CKLA for preschool.

A Unique Pre-K Curriculum

CKLA Preschool is a comprehensive language arts curriculum that explicitly supports the development of knowledge and skills identified as key to building skilled, fluent readers.* In addition to systematically building children's knowledge of letters, sounds, and print, CKLA Preschool is designed to expose young children to content-rich, coherent, cumulative instruction. It does so by building and deepening background knowledge using teaching practices that are appropriate for young children and generally familiar to early educators. Students and teachers engage in activities like singing songs and nursery rhymes, playing games in small groups, creating extended dramatic play scenarios, making crafts, reading books, and listening to stories. These activities not only are fun and appropriate experiences for young children, but

*To learn more about Core Knowledge Language Arts Preschool, see the general overview at www.bit.ly/1bRKZJD. To download the entire CKLA program, preschool through third grade, for free, see www.coreknowledge.org/ckla-files.

Content on the Cutting-Room Floor

A Brief History of the Elementary Curriculum

BY RUTH WATTENBERG

The basic treatment of content in the elementary grades has not changed for decades. *A Nation at Risk*, the 1983 report of the National Commission on Excellence in Education,[1] decried "disturbing inadequacies" in American education, including the wholly inadequate content offered to students.

That report helped launch several decades of education reform, aimed at rectifying, however inadequately, the problems that it found. Among the changes were stiffer high school course requirements in the core subjects;[2] subject-matter exams in a growing number of states (as opposed to minimum competency tests);[3] increased numbers of students taking more-advanced courses (though students are not always learning more as a result);[4] and state adoption of academic standards in major subject areas. Thirty years after *A Nation at Risk*, a new infrastructure—in the form of state-mandated requirements, standards, and exams—is in place, with the potential to support, encourage, and monitor greater learning at the high school level.

But, *A Nation at Risk* had a glaring omission: reflecting the nation's long-standing lack of interest in content in the early grades, the report's authors barely mentioned elementary schools. Unsurprisingly, as a result, the post-1983 education reforms barely touched them. Here is the crucial fact about the teaching of content in the elementary grades, then and still: too much time is spent on reading and math, especially reading, and too little on history/social studies, science, literature, and arts—the content subjects that build a student's foundation of knowledge.

> U.S. elementary schools in the 1980s were woefully thin on content. Since then, that has not changed.

Even before *A Nation at Risk*, the 1977 National Survey of Science, Mathematics, and Social Studies Education found that K–3 teachers spent 95 minutes per day on reading and a total of 38 minutes on *both* science and social studies together—2.5 times as much on reading as on both other subjects.[5] In grades 4–6, when students have presumably learned the basic reading skills and in-class reading time can be substantially cut back, teachers spent 66 minutes per day on reading, 28 on science, and 34 on social studies—with reading still getting more time than the two other subjects combined.[6]

Was there any academic content or knowledge taught in those hours devoted to reading? The best way to find out is to look at the textbooks used to teach reading, commonly known as basal readers, which for many years have served as the spine of the reading curriculum. In 1983, William Schmidt and his colleagues at the Institute for Research on Teaching analyzed 34 basal readers for the second, fourth, and fifth grades, from eight major publishers, for a total of 1,959 different selections. Here is what they found:[7]

- 42 percent had no subject-matter content at all (defined as covering theories, facts, and information from typical elementary subjects, such as math, science, and social studies);
- 20 percent had content that was of a language arts nature—how words were formed, etc.;
- 20 percent had social science content (a third of which was "social themes," concerning "enduring problems of individual and social life," such as growing up, living with family members, etc.);
- 12 percent had science content; and
- Less than 6 percent had content in any other major subject-matter area, including art and music.

And, the lower the grade, the emptier it was of content. In second-grade books, 52 percent of the texts had no subject-matter

Ruth Wattenberg is a former director of the AFT's educational issues department and a former editor of American Educator. *She is currently a trustee of the Core Knowledge Foundation. This sidebar is adapted, with permission of the Thomas B. Fordham Institute, from a longer book chapter in* Knowledge at the Core: Don Hirsch, Core Knowledge, and the Future of the Common Core, *edited by Chester E. Finn Jr. and Michael J. Petrilli.*

are designed to create explicit opportunities for students to connect to specific content in the curriculum.

Infused throughout all grades of CKLA, but unique among preschool curricula, is the careful consideration given to the timing and sequencing of this content and how it contributes to students' later learning. Topics and subtopics are presented in a deliberately planned order, so that basic information and larger concepts build over time.

The end result is broad academic knowledge and skills, but what is the starting point in early childhood? Since many, many students arrive at preschool without prior educational experience, CKLA Preschool begins with the child himself. Starting with students' own experiences of themselves is a deliberate choice aimed at finding common ground for all students, regardless of socioeconomic or educational background. Moving all students forward together from this common place then becomes the aim of the first preschool domain, called "All About Me."

"All About Me" begins with the vocabulary and content the child needs to talk about himself—age, body parts, hair color, likes and dislikes, favorite activities, etc. Teachers and students read aloud and sing favorite songs and nursery rhymes (e.g., "Head and Shoulders, Knees and Toes" and "Where Is Thumbkin?") as they teach this content (see the sidebar on page 26). Strategically, they use these rhymes to teach and reinforce not only content, but also skills that prepare children to become fluent decoders in later grades. Essential early skills include

content at all. Some 11 percent had science content and 14 percent social science.[8] Taken as a whole, U.S. elementary schools in the 1980s were woefully thin on content.

Since then, that has not changed. The content-poor curriculum remains a staple at the elementary level. In contrast to secondary schools, most of the reform energy at the elementary level has focused on beefing up instruction in basic reading and math skills, with no infrastructure for driving improvements in the content areas. Even the academic content standards developed by states were typically weakest in the elementary grades.

The Fordham Institute has evaluated state standards in science and history periodically since 1998. Its reviewers have often aimed their greatest criticism at the early-grade standards, finding that they contain virtually no content, are repetitious across grades, and fail to address either sequencing or rigor.[9]

Like standards, textbooks have continued to neglect the content that underlies reading comprehension. For example, 20 years after Schmidt's study of basal textbook content, Kate Walsh, now director of the National Council on Teacher Quality, in 2003 reviewed the first- and second-grade texts from five top-selling basal-reader series. She found that they offered "mostly incoherent, banal themes that missed opportunities to develop word and world knowledge by offering and exploiting content-rich themes."[10]

The recent policy emphasis on reading skills has led schools to further increase the time devoted to the English language arts block, leaving even less time devoted to history/social studies, science, and the arts than in earlier years. As shown in the table above, according to the National Survey of Science and Mathematics Education, the total time spent in grades K–3 on both

Minutes spent *per day* on science and social studies

	1977	2000	2012
K–3 social studies	21	21	16
4–6 social studies	34	33	21
K–3 science	17	23	19
4–6 science	28	31	24

SOURCE: DATA FROM THE *NATIONAL SURVEY OF SCIENCE AND MATHEMATICS EDUCATION*, REPORTS FOR 1977, 2000, AND 2012. SEE ENDNOTE 11 FOR FULL CITATIONS.

science and social studies dropped 45 minutes per week from 2000 to 2012—from 3 hours and 40 minutes in 2000 to 2 hours and 55 minutes in 2012—meaning just 19 minutes per day for science and 16 minutes per day for social studies! (It had risen slightly between 1977 and 2000; it is now lower than it was in 1977.) In grades 4–6, the drop between 2000 and 2012 was 95 minutes per week.[11]

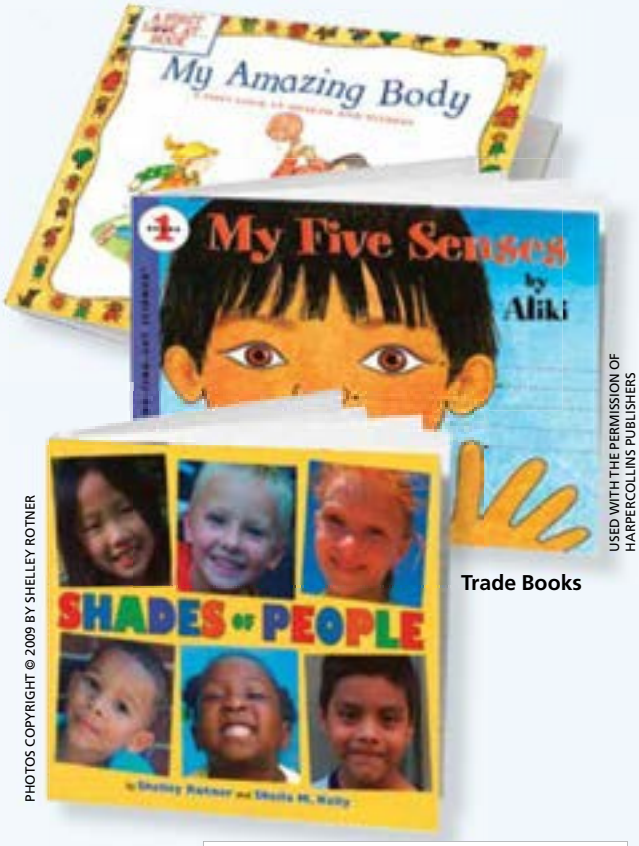
In 2010, in a national survey of teachers conducted by Common Core* (an independent organization unconnected to—though supportive of—the Common Core State Standards), 63 percent of elementary teachers in self-contained classrooms indicated that social studies had been getting less "instructional time and resources over the past ten years" (or since they had begun teaching, if that was less than 10 years earlier). Fifty percent said that science had been getting less; and 49 percent and 37 percent, respectively, said the same of art and music.[12]

The squeeze on content was even tighter for struggling students. When elementary teachers were asked during what time period struggling students received extra instruction in English language arts or math, 60 percent said that these students were pulled from social studies class, and 55 percent said from science class.[13] The bottom line: for decades, elementary schools have neglected to build the content foundation that students need and that the Common Core State Standards require for success. This reality is now ingrained in decades of elementary school practice.

To provide students with the necessary content foundation, the elementary curriculum must be thoroughly revamped so that history/social studies, science, and the arts are taught extensively and coherently. This will require that these subjects get more time in classes of their own and, at least as importantly, that they be heavily integrated into reading textbooks and instruction. Once revamped, curricular tools (curriculum frameworks, course outlines, etc.) and classroom materials that embody the new curriculum must be produced, and time, support, and training must be provided for teachers, so they can make good, smart use of the new materials.

(Endnotes on page 42)

*Highlights from this survey by Common Core and the Farkas Duffett Research Group, sponsored by the Ford Foundation and the AFT, are found in *Learning Less: Public School Teachers Describe a Narrowing Curriculum* (Washington, DC: Common Core, 2012), available at http://commoncore.org/maps/documents/reports/cc-learning-less-mar12.pdf.



Trade Books

Playful Immersion

Centers and Activities Reinforce Emerging Knowledge and Skills

CKLA Preschool kits come with an array of materials to infuse language-, vocabulary-, and knowledge-building opportunities throughout the various centers and activities typically found in a high-quality preschool setting. The materials include trade books, posters with nursery rhymes and songs, big books, and image collections, as well as detailed teacher guides to show how all of the materials work together. A sample of these materials is shown here; to see the complete program, download it for free at www.coreknowledge.org/ckla-files.

Trade Books

Familiar trade books are read aloud throughout CKLA Preschool. These books reinforce content covered in the domains and familiarize students with the conventions of print and book reading. The books shown to the left are read during the "All About Me" domain to highlight what makes people similar and unique, the parts of the body, and the five senses.

Learning Center Cards

CKLA Preschool includes two types of Learning Center Cards, as shown to the left: reference guides for adults and visual guides with labels for students. In "Doctor's Office," for example, students use their knowledge of body parts and descriptive words from "All About Me" as they engage in dramatic play. Meanwhile, the quick-reference poster for teachers and classroom volunteers reminds adults of key content and vocabulary as they facilitate the Learning Center.

Learning Center Cards

Activity Pages

Activity Pages for use at home and in school provide a springboard for adults to facilitate conversations that reinforce domain-related concepts and vocabulary. Two examples are below. The one on the left, from the "All About Me" domain, asks students to point to illustrated body parts. The one on the right, from the "Animals" domain (which comes about halfway through the school year), reinforces code-related knowledge and skills in a developmentally appropriate way. Teachers have students count the number of syllables in the names of the animals. Students then record the number of syllables in each word by coloring in the corresponding number of empty squares.

Transition Cards

Transition Cards are provided to assist teachers in reviewing and reinforcing concepts and skills as they move students from one activity to another. For example, the Transition Card shown below on the right is designed for reviewing code-related skills taught in small groups. At the beginning of the school year, for example, a teacher might hold up two visually and phonetically distinct capital letters, such as *M* and *P*, and ask, "Matteo, which of these letters is at the beginning of your name?" Later in the year, a teacher might hold up the card shown here and ask what sound is at the beginning of "mittens," "monkey," "moon," and "man."

–C.G. and L.H.

Activity Pages

Transition Card

rhyming, sound awareness, and syllable awareness. Together, the content and skills that students learn early in the curriculum provide the foundation for later learning about less familiar, more abstract concepts and ideas.

For example, in the "All About Me" domain, students learn the names of the parts of their own bodies, which is knowledge they refresh and extend during the "Animals" domain taught later in the preschool year. Drawing on their knowledge of their own body parts from the beginning of the year, students studying the "Animals" domain expand their concept of body parts when they learn about animals' body parts (e.g., beaks, eyes, legs), their functions (e.g., for eating, seeing, walking), and how body parts help classify animals (e.g., birds have beaks). That knowledge is extended yet again in kindergarten during "The Five Senses" domain. Then, in a series of human body domains spread across first through third grades, students learn about the human body's basic organs and how those organs form systems. (To see some of these materials and connections just described, see the sidebar on pages 26 and 27.)

Similarly, children's early understandings of animals' body parts and categories of animals prepare them for later explorations of animals that live in specific habitats (in preschool, kindergarten, and first-grade domains), the three main body parts that characterize insects (second grade), and the difference between vertebrates and invertebrates and how this difference informs animal classification (third grade). This intentional, careful sequencing of content enables students to quickly build complex knowledge and vocabulary. With CKLA, children experience the joy of learning because they see how interesting academic content is—and they are well prepared to comprehend academic texts in later grades.

As the year unfolds, the content of the CKLA Preschool curriculum expands to include literature, science, and history—all still taught through the same developmentally appropriate activities and contexts familiar to teachers and students. The goal is always to build a strong foundation of knowledge so that students can later understand the complex and nuanced relationships that exist within and across content areas.

For example, as preschoolers begin to grasp the concept of time and events that occurred in the past, they are introduced to Native Americans as part of the "Important People in American History" domain (see the sidebar on page 27). Through a read-aloud, a rich array of accompanying images, and related activities, children begin to conceptualize the first people to live in what is now the United States. The read-aloud begins with some content that will be familiar, weaving in the unfamiliar:

> Long, long ago, long before your mother and father were born, and even long before your grandparents were born, the United States looked very different. … In that time long, long ago … there were trees and rivers. There were rocks and mountains. There were wild animals, like deer and birds. The only people who lived here way back then were the Native Americans.

They learn about Native Americans' diets, activities, and homes, and compare these with their own present-day experiences, noting similarities and differences. Toward the end, the read-aloud becomes more specific: "The Native Americans we have been learning about have a special name. They are a group, or tribe, of Native Americans called the Wampanoag. A long, long time ago, there were many groups, or tribes, of Native Americans living all over the United States." To deepen understanding, the teacher reviews some of the read-alouds, then shows new images with modern-day information:

> Native Americans still live in the United States today. This is a photograph of a Native American boy wearing clothing that is like the clothing some Native Americans wore long ago. This is a photograph of a Native American family. There is a mom, a dad, and a son.

Of course, preschoolers do not understand *exactly* how or how long ago Native Americans lived prior to European exploration or the series of events that led to modern-day life, but they begin to get a sense of the past and that things were not always the

The CKLA domains are carefully organized to build on each other within and across grades, giving students opportunities to refine and expand their knowledge and vocabulary over time.

These images are from CKLA Preschool "Classic Tales" Activity Pages and are designed for students to take home to their families.

way they are today. (For more details, including images, see the sidebar below.)

Students, ending the preschool year with some knowledge of the passage of time more generally and the Native Americans more specifically, are well-poised for the kindergarten CKLA domain that examines Native American tribes and traditions in more depth. Going forward, students are equipped for two in-depth third-grade domains, "Native Americans: Regions and Cultures" and "European Exploration of North America."

This foundation regarding Native Americans, as well as the rest of the "Important People in American History" domain, is the beginning of a very systematic series of domains on American history. From "Columbus and the Pilgrims" in kindergarten to "Frontier Explorers" in first grade to "Fighting for a Cause" in second grade (and many in between), these domains grow steadily more detailed and nuanced. Throughout, they aim to be accurate regarding our national achievements and shortcomings, while also celebrating America's ideals. As E. D. Hirsch Jr.,* the founder of the Core Knowledge Foundation, has explained, this is crucial to studying American history in a way that is patriotic but not nationalistic:[6]

*For more of E. D. Hirsch Jr.'s work, see *American Educator*'s authors index at www.aft.org/newspubs/periodicals/ae/authors2.cfm.

Preschoolers to Presidents

CKLA Builds Knowledge Step by Step

As described in the main article on page 19, CKLA Preschool is carefully designed to build knowledge and vocabulary. Across the year, children participate in interactive read-alouds and enjoy activities grouped in five core domains: "All About Me," "Families and Communities," "Animals," "Plants," and "Habitats." The school year intentionally starts with the child, so that everyone has equal learning opportunities (regardless of how much academic preparation they have had at home), and then the domains are sequenced such that each builds on what has been learned. This approach not only facilitates comprehension, it also provides ample occasions for review. In addition, two more domains are interspersed throughout the school year. One is "Classic Tales," which contains a dozen cherished stories, and the other is "Important People in American History." Here we take a closer look at "All About Me," and show how its content is expanded upon in the "Animals" and "Important People in American History" domains.

Body parts are an essential component of the knowledge and vocabulary students acquire during the "All About Me" domain. They acquire this knowledge in class, as teachers show images during an active read-aloud in which students point to and move their body parts as they listen to a rhyme. As shown in the CKLA images on the left, the program also offers materials for a related activity students can enjoy at home with their families, reinforcing what they have learned in school.

In the "Animals" domain (see the top images to the right), children draw on what they have learned about their bodies to think about how they are similar to and different from animals. These images are shown as teachers read aloud text that combines content knowledge and rhyme:

> You are an animal. This bird is too.
> Yes, you are an animal—
> But you don't have a pointy **beak** like some animals do.
>
> You are an animal. This dog is too.
> Yes, you are an animal—
> But you don't have a **furry** body like some animals do.

The "Important People in American History" domain is taught in association with national holidays (i.e., Thanksgiving,

Before the American experiment, "nation" was determined by place and birth. … American patriotism is inherently different. It's … not based on birth but on a set of Enlightenment ideas, … ideas of equality, freedom, and toleration. … *Core Knowledge* … tries to strike the right balance between loyalty to ideals and historical truth. … Nationalism defines one group … against others. It sees differences as inherent and essential. … It is nativist, and uses terms that imply contamination and infiltration. That of course goes against the universalism of our founding ideals. The trans-national patriotism of the United States, symbolized by the flag, can accommodate all tribes within a larger conceptual loyalty learned in childhood.

From preschool through third grade, CKLA is carefully designed to plant the seeds for future studies and future responsibilities. By holding firm to the highest goals for education, CKLA demonstrates one way educators can develop the broad academic knowledge, vocabulary, and skills that really do matter most. We would never deprive our children of the oxygen they need to live. Why would we deprive them of the coherent, cumulative, content-rich curriculum they need to become educated citizens and lifelong learners? ☐

(Endnotes on page 43)

Martin Luther King Jr. Day, Presidents' Day, and Women's History Month). The first topic, taught just before Thanksgiving, is Native Americans (a few of the images are shown on the right). To provide context, the first read-aloud begins with basic information, much of which is familiar to preschoolers: "We live in a country called the United States of America. In the United States today, people like to talk on the phone, shop in the grocery store, play on computers, and watch television."

After adding more familiar context, the text transitions to starting to teach about history: "Long, long ago, long before your mother and father were born, and even long before your grandparents were born, the United States looked very different. There were no phones or computers, there were no tall buildings. There were no cars or tractors, and there were no grocery stores. Not as many people lived here." As teachers read, they show children what much of the land looked like.

Only after providing this context does the read-aloud go on to describe Native Americans past and present.

Once they have heard read-alouds about Native Americans and the Pilgrims, students are asked to narrate and retell the stories themselves.

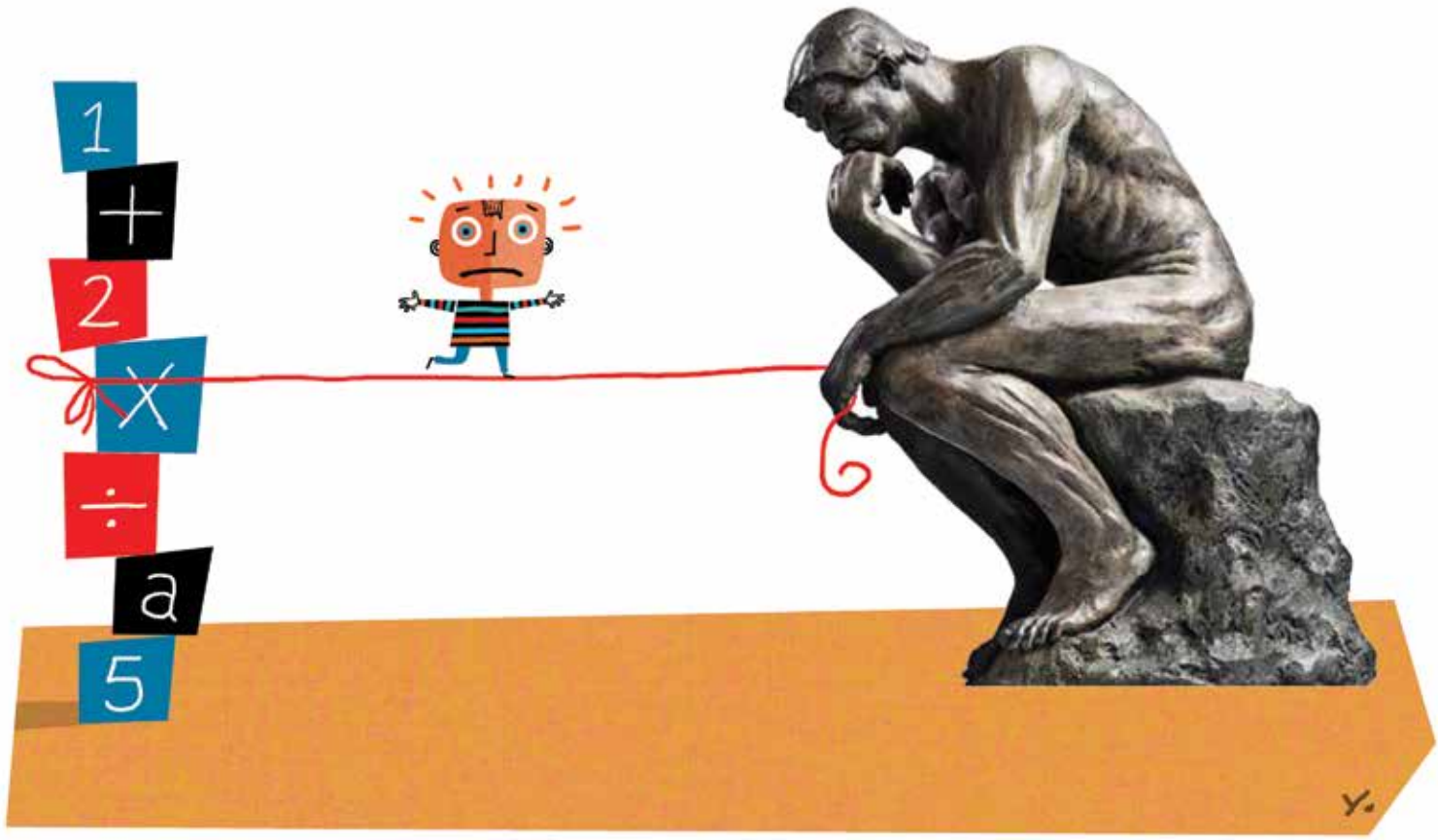
In March, for Women's History Month, the "Important People" domain wraps up with read-alouds and activities on Sonia Sotomayor (shown below). Children may not be ready to understand the Supreme Court, but they can build on what they do know—rules—to start developing an understanding of laws and judges: "Sonia Sotomayor is an important woman in the United States. She knows all about the laws, or rules, that people in the United States have to follow. Her job is to think about what the laws mean and the best way to help people obey those laws."

Note that this read-aloud also reinforces content from previous domains. It starts with a reminder that we live in the United States. Later, when children learn that Sotomayor "was so good at her job as a judge that President Obama asked her to become a justice on the Supreme Court," they are also recalling that the president of the United States is currently Barack Obama.

–C.G. and L.H.

ASK THE COGNITIVE SCIENTIST

Math Anxiety: Can Teachers Help Students Reduce It?



How does the mind work—and especially how does it learn? Teachers' instructional decisions are based on a mix of theories learned in teacher education, trial and error, craft knowledge, and gut instinct. Such knowledge often serves us well, but is there anything sturdier to rely on?

Cognitive science is an interdisciplinary field of researchers from psychology, neuroscience, linguistics, philosophy, computer science, and anthropology who seek to understand the mind. In this regular American Educator *column, we consider findings from this field that are strong and clear enough to merit classroom application.*

By Sian L. Beilock and Daniel T. Willingham

Question: Some of my students seem to get really nervous about math. I can understand not liking the subject very much—to be honest, I don't love it myself—but their nervousness seems to get in the way of their understanding. How can I reassure them or otherwise make them less anxious?

Answer: There is no doubt that math makes some students very anxious. This problem can begin as early as elementary school, and might be prompted both by genuine concerns—the student perceives that his or her math skills need work—and by social cues that subtly convey the message that math should be feared. Research on how to best help students through this problem is ongoing, but there are a few techniques that teachers may find useful.

Sian L. Beilock is a professor of psychology and a member of the Committee on Education at the University of Chicago. Her recent book, Choke: What the Secrets of the Brain Reveal About Getting It Right When You Have To, *discusses intelligence, performance, and how to succeed in high-pressure situations. Daniel T. Willingham is a professor of cognitive psychology at the University of Virginia. His most recent book,* When Can You Trust the Experts? How to Tell Good Science from Bad in Education, *provides a shortcut for evaluating claims about programs and strategies. His previous book,* Why Don't Students Like School?, *helps teachers apply research on the mind to the classroom setting. For his articles on education, go to www.danielwillingham.com. Readers can pose questions to "Ask the Cognitive Scientist" by sending an email to ae@aft.org. Future columns will try to address readers' questions.*

ILLUSTRATIONS BY JAMES YANG

Too many people, "math" is a scary four-letter word. They don't like it, they don't feel like they are very good at it, and they just want to stay away from it. People who feel tension, apprehension, and fear of situations involving math are said to have *math anxiety*. And, perhaps not surprisingly, math anxiety is associated with poor math performance in school. Students with a high degree of math anxiety perform worse in math from elementary school through college, relative to their less math-anxious counterparts.[1] But, it's not just school situations where a negative relationship between math anxiety and mathematical performance emerges. Higher levels of math anxiety are associated with poor calculations of drug dosages by nurses and impaired financial planning.[2]

Math anxiety is not limited to a minority of individuals nor to one country. International comparisons of high school students show that some students in every country are anxious about math. It is perhaps unsurprising that there is an inverse relationship between anxiety and efficacy: countries where kids are less proficient in math (as measured by the Program for International Student Assessment, or PISA) tend to have higher levels of math anxiety.[3] In the United States, an estimated 25 percent of four-year college students and up to 80 percent of community college students suffer from a moderate to high degree of math anxiety.[4] Most students report having at least one negative experience with math at some point during their schooling.[5]

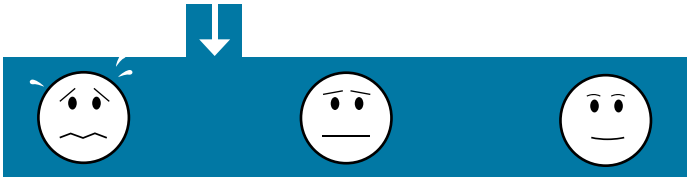
Anecdotally, most of us can recall a time when we overheard a friend, colleague, or family member talk about his dislike for math or how she is "not a numbers person." This is a notable contrast to reading; few people cheerfully volunteer that they just aren't very good readers. It seems socially acceptable to be anxious about math.

Because math anxiety is widespread and often tied to poor math skills, it's imperative to understand when anxiety about math starts to emerge, where it comes from, and what we can do to alleviate it. Only then can we start to attack the phenomenon, identifying strategies that target both how material is taught and how students feel about math, as a means to lower math anxiety, raise math achievement, and ensure that we are equipping students with the level of mathematics knowledge needed for the 21st-century workplace. Although research on math anxiety goes back to the 1970s, it has really gained momentum only in the last 10 years or so. Still, in that time, we have learned much about its origins and some ways to combat it.

When and How Does Math Anxiety Emerge?

Recently, several studies have examined early elementary students, and they indicate that math anxiety starts early. Although the specific details of these studies vary, the general questions have been similar: Do early elementary students report math anxiety and, if so, how is it related to math performance?

In one recent study, math anxiety was assessed in 154 first- and second-graders with a newly developed scale that asked them questions like, "How do you feel when taking a big test in your math class?" or "How do you feel when getting your math book and seeing all the numbers in it?"[6] Kids responded by using a sliding scale that featured a calm face on the far right, a moderately nervous face in the middle, and an obviously nervous face on the far left (see figure below).



SOURCE: GERARDO RAMIREZ, ELIZABETH A. GUNDERSON, SUSAN C. LEVINE, AND SIAN L. BEILOCK, "MATH ANXIETY, WORKING MEMORY, AND MATH ACHIEVEMENT IN EARLY ELEMENTARY SCHOOL," *JOURNAL OF COGNITION AND DEVELOPMENT* 14 (2013): 187–202. REPRINTED BY PERMISSION OF TAYLOR & FRANCIS LTD, WWW.TANDF.CO.UK/JOURNALS.

Several days later, they completed a standardized test of math achievement (the Woodcock-Johnson III Applied Problems subtest).[7] The test included items like identifying the correct time on a clock, money calculations, and word problems requiring arithmetic or simple fraction work.

Do first- and second-graders report having math anxiety? Yes. Averaging across all the questions, nearly 50 percent of the students reported medium to high levels of math anxiety, being "moderately nervous" to "very, very nervous" about math. Do these reports of math anxiety relate to students' math achievement? Yes, and in the way you would expect: higher math anxiety was associated with lower achievement (though, as we discuss below, this relation was stronger for some students than others). Finally, math anxiety's predictive power was specific to math—there was little association between math anxiety and performance on a reading comprehension test.

Because math anxiety is widespread and tied to poor math skills, we must understand what we can do to alleviate it.

Is Math Anxiety Just Another Name for "Bad at Math"?

We've just reviewed findings that math anxiety and math achievement are related. But how could it be otherwise? After all, math-anxious individuals stay away from math courses and math-related situations, and they learn less math in the courses they do take. Indeed, it's tempting to conclude that their anxiety is logical—they are anxious because they are bad at math. For that matter, maybe the whole notion of "math anxiety" is not useful. Some might assume it's pretty much just another name for "poor math skills."

Math anxiety implies more than "bad at math." It implies that someone would be better at math if he or she weren't so anxious. And there is evidence that's true. A growing body of work shows that math anxiety robs people of working memory. You can think of working memory as a kind of mental scratch pad—it's what allows you to keep several things in mind simultaneously, and to

manipulate them in order to think and solve problems. For example, suppose a parent says to a teenager, "Your chores this afternoon are to clean the cat litter box, set the table for dinner, and take out the trash. And if you could chop some vegetables for the stew I'm going to make later, that would be nice." The teen thinks, "Chopping vegetables and cleaning the cat box will make a mess, so I should take out the trash after I do those chores. And my hands should be clean when I set the table and when I chop vegetables. So I guess I'll wash my hands, then set the table, then chop vegetables, then clean the cat box, then take out the trash." Working memory is needed to keep the four chores in mind *and* to think about the consequences of doing each one in a particular sequence *and* to construct that sequence.

As you can imagine, if our teen had been given 10 chores instead of four, she would not have been able to keep them all in mind. Working memory can only hold so much. And the amount of "space" in working memory varies from person to person. Given that working memory is important for solving problems, it's not surprising that one's working memory capacity is related to one's problem-solving and reasoning ability and to measures of general intelligence.[8]

The role of working memory in thinking helps us understand the destructive consequences of math anxiety; anxious thoughts consume valuable working memory space.[9] Math anxiety essentially prompts students to do two things at once: solve the math problem *and* deal with worries about the math (including worries about getting the problem wrong, looking foolish, and what others may think of them). As a result, they have less working memory to devote to the math, and their math performance suffers.

Neuroscientific data also support this interpretation. For example, one group of researchers explored neural activity in brain areas associated with negative emotions and in brain areas known to support numerical computations while third-grade children—both those lower and those higher in math anxiety—performed math problems.[10] When performing mathematical calculations, math-anxious children, relative to their less anxious peers, show more brain activity in the right amygdala (known to be important for processing negative emotions). This increased amygdala activity was accompanied by a reduction in activity in brain regions known to support working memory and numerical processing (e.g., the dorsolateral prefrontal cortex and the posterior parietal lobe). Using similar functional magnetic resonance imaging (fMRI) methods, another group of researchers found that the higher one's math anxiety, the larger the increase in activity in brain regions associated with threat and the experience of pain.[11] Interestingly, we observed this relation when highly math-anxious people just *anticipated* doing math.

Which Students Are Most Susceptible?

Math anxiety may start when children are quite young, but it can't come out of nowhere. What prompts it? Factors related to both students' math abilities at the start of elementary school and students' social environment (in the classroom, at home, and in society in general) likely play a role in the development of math anxiety.

We know that adults with math anxiety tend to have shortfalls in one or more of the basic building blocks of mathematical thinking and reasoning. These building blocks include skills like counting objects, deciding which of two numbers represents the larger quantity, and mentally rotating three-dimensional objects.[12] We have speculated that a poor grasp of basic math building blocks early in schooling may predispose students to develop math anxiety, partly in response to their potential struggles in math. It seems predictable that students who struggle with math would be more likely to become anxious about it.

Math anxiety robs people of working memory, which is important for solving problems.

Another characteristic of kids is important, but this one doesn't predict who is likely to suffer from anxiety. Instead, it predicts whose math performance is most disrupted should they get anxious. And the finding is rather counter-intuitive: kids with the highest level of working memory show the most pronounced negative relation between math anxiety and math achievement.[13] In other words, students with the most cognitive horsepower seem to suffer the most as a function of math anxiety. How can this be? Math anxiety depresses math performance because it eats up working memory space. Wouldn't these students have spare working memory capacity, so anxiety would have less of an impact?

The answer to this question is not completely clear, but one possibility is that students with the most working memory tend to rely on more advanced problem-solving strategies;[14] presumably, they're in the habit of using these cognitively demanding strategies because they typically have the mental resources to carry them out. For instance, a simple strategy for a first-grader solving the problem "8 + 4 = ?" would be counting on his fingers. A strategy that demands more of working memory would be

decomposition, or breaking down units so that they are easier to process (e.g., 8 + 4 → 8 + 2 + 2). Because the advanced strategies demand more working memory, they are more sensitive to anxiety's deleterious effects. Ironically, something that usually helps kids in math—large working memory capacity—becomes vulnerable to disruption when they are anxious.

Social Influences and Math Anxiety

There is some evidence that children might pick up on cues from parents, teachers, or peers that math is, indeed, worthy of anxiety. Children who start schooling with deficiencies in basic mathematical skills may be especially predisposed to pick up on social cues (e.g., their teachers' behavior) that highlight math in negative terms.[15]

There is also evidence of a more general link between teachers' behavior and students' math performance. In a preliminary study of 17 teachers and 117 first- and second-grade students, researchers found that female elementary school teachers' math anxiety (over 90 percent of elementary school teachers in the United States are female) related to their female students' math achievement at the end of the school year—the higher a teacher's math anxiety, the lower her female students' math achievement by the end of the school year (that's after accounting for girls' beginning-of-the-year math achievement and teachers' math knowledge).[16] Initially, we interpreted our findings as being specific to girls (a transmission of math negativity from female teachers to female students). However, in a large-scale follow-up enlisting more than 70 teachers and 650 of their first- and second-grade students, we found that teachers' math anxiety also is negatively related to boys' math achievement (albeit not as strongly) at the end of the school year. Regardless of a student's gender, his or her teacher's math anxiety seems to carry implications for the student's level of math achievement.[17]

Of course, there are many sources from which negativity about math could develop—ranging from parents to the media. But, clearly, information about positive and negative aspects of math can be found in the classroom, and it seems, at least at first glance, that not only do kids pick up on this negativity but it also carries implications for their math achievement across the school year.

What Can Teachers Do about Math Anxiety?

While there is still a lot of work to be done to gain a complete understanding of math anxiety, knowing something about where math anxiety comes from, how it relates to math performance, and whom it is most likely to affect helps us start to think about the remediation of math anxiety.

Ensure fundamental skills. Enhancing basic numerical and spatial processing may help guard against the development of math anxiety in young students. Research shows that the quality of numerical and spatial talk by parents in the home is related to children's math and spatial skills.[18] Thus, something as simple as encouraging parents to engage with young children around math may help ensure that children come to school with basic mathematical competencies that help prevent math anxiety. On the flip side, identification of at-risk students, coupled with targeted exercises designed to boost their basic mathematical competencies and regulate their potential anxieties, may help to prevent at-risk children from developing math anxiety.

A course on *how* to teach math concepts seems to be more effective in addressing math anxiety among pre-service teachers than a course on math concepts themselves.

Focus on teacher training. Knowledge that a teacher's math anxiety can affect her students' math achievement suggests that we also need to ensure that teachers feel fully confident in their preparation to teach math. Researchers have found that a course focused on *how* to teach math concepts was more effective in addressing math anxiety among pre-service teachers than a course focused directly on the math concepts themselves.[19] This point is especially salient with the onset of new curricula prompted by the Common Core State Standards. Even experienced teachers may be asked to teach new material.

Try reducing anxiety by changing the assessment. Math anxiety depresses math performance because it occupies working memory. Research has shown that math anxiety is more strongly linked to poor performance when students take a timed test.[20] There are likely several reasons why alleviating time pressure makes math anxiety less of a problem, from reducing worries about not finishing in time, to giving students the time and space to work through their answers.

Try reducing anxiety through a writing exercise. Giving students the opportunity to write freely about their emotions for about 10 minutes with respect to a specific situation (e.g., an

upcoming exam) can help boost test performance. Writing is thought to alleviate the burden that negative thoughts place on working memory by affording people an opportunity to re-evaluate the stressful experience, such as thinking, "Oh, maybe this math test isn't really *that* big of a deal." In recent work, we showed that writing before an upcoming math test helped reduce the performance gap between students with higher levels of math anxiety and those with lower levels,[21] and others have shown that this writing exercise can be beneficial for test taking in general, whether it is the MCAT[22] or a high school biology final.[23] Of course, such writing may not be appropriate for young students, which means there is still more work to be done to determine how to alleviate the math anxiety that some students feel at the start of formal schooling.

Below is an example of how we have prompted students to put their thoughts down in writing before an exam (we also tell them that their teachers won't see their writing and that no one will be able to link it to them):[24]

> *Take the next several minutes to write as openly as possible about your thoughts and feelings regarding the exam you are about to take. In your writing, really let yourself go and explore your emotions and thoughts as you are getting ready to start the exam. You might relate your current thoughts to the way you have felt during other similar situations at school or in other situations in your life. Please try to be as open as possible as you write about your thoughts at this time.*

Think carefully about what to say when students struggle. When a student struggles with math (or any subject), it's natural to want to console him. You can see he's frustrated and unhappy, and you want to help him feel better. But consoling the student—by saying, for example, "It's OK, not everyone can be good at these types of problems"—may send the wrong message. The student may understand the subtext to be, "You've failed, and I am really sorry about that, but I'm not contradicting your conclusion that this math work is too hard for you." Consolation sends a subtle message that validates the student's opinion that he's not good at math, and can lower a student's motivations and expectations for future performances.

A better message is only slightly different: "Yes, this work is challenging, but I know that with hard work you can do it!" This acknowledges the student's experience—there's no sugarcoating the fact that he can't do it—but it expresses confidence that he has the capability. Also, giving concrete strategies for changing up study habits or for approaching a particular problem differently in the future helps him understand that, with added hard work and effort, he has the potential for success.[25] □

When students struggle, teachers should acknowledge that the work is challenging but that they can do it.

Endnotes

1. Erin A. Maloney and Sian L. Beilock, "Math Anxiety: Who Has It, Why It Develops, and How to Guard against It," *Trends in Cognitive Science* 16 (2012): 404–406.

2. Miriam McMullan, Ray Jones, and Susan Lea, "Math Anxiety, Self-Efficacy, and Ability in British Undergraduate Nursing Students," *Research in Nursing and Health* 35 (2012): 178–186; and Judy Sheaks McKenna and Sharon Y. Nickols, "Planning for Retirement Security: What Helps or Hinders Women in the Middle Years?," *Home Economics Research Journal* 16 (1988): 153–164.

3. Jihyun Lee, "Universals and Specifics of Math Self-Concept, Math Self-Efficacy, and Math Anxiety across 41 PISA 2003 Participating Countries," *Learning and Individual Differences* 19 (2009): 355–365.

4. W. George Jones, "Applying Psychology to the Teaching of Basic Math: A Case Study," *Inquiry* 6, no. 2 (2001): 60–65; and David S. Yeager, "Productive Persistence: A Practical Theory of Community College Student Success" (paper presented at the annual meeting of the American Educational Research Association, Vancouver, Canada, April 2012).

5. Joseph M. Furner and Mary Lou Duffy, "Equity for All Students in the New Millennium: Disabling Math Anxiety," *Intervention in School and Clinic* 38 (2002): 67–74.

6. Gerardo Ramirez, Elizabeth A. Gunderson, Susan C. Levine, and Sian L. Beilock, "Math Anxiety, Working Memory, and Math Achievement in Early Elementary School," *Journal of Cognition and Development* 14 (2013): 187–202. See also Sarah S. Wu, Maria Barth, Hitha Amin, Vanessa Malcarne, and Vinod Menon, "Math Anxiety in Second and Third Graders and its Relation to Mathematics Achievement," *Frontiers in Psychology* 3, no. 162 (2012).

7. Richard W. Woodcock, Kevin S. McGrew, and Nancy Mather, *Woodcock-Johnson III Tests of Cognitive Abilities* (Itasca, IL: Riverside, 2001).

8. Randall W. Engle, "Working Memory Capacity as Executive Attention," *Current Directions in Psychological Science* 11 (2002): 19–23.

9. Mark H. Ashcraft, "Math Anxiety: Personal, Educational, and Cognitive Consequences," *Current Directions in Psychological Science* 11 (2002): 181–185; and Sian L. Beilock, "Math Performance in Stressful Situations," *Current Directions in Psychological Science* 17 (2008): 339–343.

10. Christina B. Young, Sarah S. Wu, and Vinod Menon, "Neurodevelopmental Basis of Math Anxiety," *Psychological Science* 23 (2012): 492–501.

11. Ian M. Lyons and Sian L. Beilock, "Mathematics Anxiety: Separating the Math from the Anxiety," *Cerebral Cortex* 22 (2012): 2102–2110.

12. Erin A. Maloney, Evan F. Risko, Daniel Ansari, and Jonathan Fugelsang, "Mathematics Anxiety Affects Counting but Not Subitizing during Visual Enumeration," *Cognition* 114 (2010): 293–297; Erin A. Maloney, Daniel Ansari, and Jonathan A. Fugelsang, "The Effect of Mathematics Anxiety on the Processing of Numerical Magnitude," *Quarterly Journal of Experimental Psychology* 64 (2011): 10–16; and Erin A. Maloney, Stephanie Waechter, Evan F. Risko, and Jonathan A. Fugelsang, "Reducing the Sex Difference in Math Anxiety: The Role of Spatial Processing Ability," *Learning and Individual Differences* 22 (2012): 380–384.

13. Ramirez et al., "Math Anxiety, Working Memory, and Math Achievement"; Gerardo Ramirez, "The Cognitive Mechanism Underlying Math Anxiety in Early Elementary School" (PhD diss., University of Chicago, 2013); and Rose K. Vukovic, Michael J. Kieffer, Sean P. Bailey, and Rachel R. Hariri, "Mathematics Anxiety in Young Children: Concurrent and Longitudinal Associations with Mathematical Performance," *Contemporary Educational Psychology* 38 (2013): 1–10.

14. Pierre Barrouillet and Raphaelle Lépine, "Working Memory and Children's Use of Retrieval to Solve Addition Problems," *Journal of Experimental Child Psychology* 91 (2005): 183–204; and David C. Geary, Mary K. Hoard, Jennifer Byrd-Craven, and M. Catherine DeSoto, "Strategy Choice in Simple and Complex Addition: Contributions of Working Memory and Counting Knowledge for Children with Mathematical Disability," *Journal of Experimental Child Psychology* 88 (2004): 121–151.

(Continued on page 43)

Writing about Writing

The Challenge of Helping Students "Get It Down on Paper"

By Andy Waddell

In the 1954 novel *The Horse and His Boy*, part of "The Chronicles of Narnia" series by C. S. Lewis, an aristocratic young lady from a country called Calormen is called upon to relate her tale. Lewis describes the lady's audience as listening avidly, "For in Calormen, story-telling (whether the stories are true or made up) is a thing you're taught, just as English boys and girls are taught essay-writing. The difference is that people want to hear the stories, whereas I never heard of anyone who wanted to read the essays." How true, how depressingly true!

As an English teacher, nothing I do is as important as teaching writing, and nothing is harder than getting a bunch of high school students to produce anything worth reading. After a quarter century on the job, it is still by far my biggest challenge.

Student essays are by and large dreadful concoctions of misremembered facts, misinterpreted passages, and misunderstood ideas, all spewed out in mangled grammar and creative spelling, cobbled together with a formulaic structure. No wonder I carry my stacks of papers home with a heavy heart. Nightly, they perch at the edge of my table like Poe's raven, mocking me while I find something—anything—I absolutely must do first before I begin grading. Just one quick check of my email, maybe a tiny glance at Facebook, a short game of Spider Solitaire because I'm pretty sure it's good for keeping my mind sharp—and then it's down to business. Speaking of which, am I really prepared for tomorrow? Wouldn't it be more productive to create a brand-new, exciting lesson plan than expend all my energies on putting red marks on a paper for students to throw away? And besides, to be fair to the students, I really need a time when I have total concentration. 10:00 p.m. already? I have to get up in seven hours. When will I be done grading? Nevermore.

Even so, I gnaw away at the edges of the stacks. My intention always is to limit myself to five minutes per paper, but more often than not it takes about 10. I have 150 students. At five minutes each, with no breaks, I can get through them all in 12 and a half hours. With breaks? Well, that's another matter.

I pull out my trusty red pen and begin circling words and writing "SP" (spelling error) next to them. Naturally, the old standards "alot," "narrarator," and "writting" rear their ugly heads, along with the classic homonyms: there/their/they're, and to/too/two. Spelling is the least of my worries, but I do feel students need to at least be informed of their errors, as this is the primary way in which their writing will be judged after they leave school.

Whenever people gripe to me about how poorly others write, they inevitably refer to the misspelling they most recently read. If they know I'm a teacher, this is usually accompanied by a rant about

Andy Waddell teaches English at Santa Clara High School in Santa Clara, California. He has taught for 25 years.

ILLUSTRATIONS BY GIANNI DE CONNO

how superior things were back when they were in school. I've had many people claim to me that in their day, they'd get a failing grade for even one spelling or grammar error. "Between you and I, I feel badly for these kids," they tell me. "The whole school system has gone to hell…" If the speaker is over 53 (my age), I look at him skeptically. If he is my age or younger, I know he's full of baloney. As far as I can tell, there never was a golden age of spelling, and if there was, it was definitely before 1986, the year I started teaching.

Anyway, I can't afford to dwell too long on orthography; I have bigger fish to fry. "R/O" means run-on, and "Frag" stands for sentence fragment. "S/V" denotes that the subject does not agree with the verb, and "T.S." means that the verb tense has shifted, often within a sentence; to make it clearer, I circle the one verb and mark "past," and circle the other and mark "present." I also circle pronouns and loop back an arrow to the non-matching antecedent. And, of course, I'm continually adding or removing apostrophes and commas.

Whenever I tell another teacher I teach English, he inevitably shakes his head and says, "Oh, that's tough—you have all those papers to grade."

Then there are those errors that are tough to pin down. I try not to use the old favorite "Awk," meaning awkward, as this is meaningless to students, but I am a big fan of "N.C." for not clear and the more emphatic all-caps "WHAT?," which are probably no more helpful. Clarity cannot be mended by a comment.

By the time I'm ready to pull out the rubric and decide if the organization is "below standard" or "approaching standard," whether the thesis was "insightful" or merely "clear," and whether the grammar, usage, and spelling errors "impede meaning," the paper looks like a crime scene. I try to add in a positive comment regarding the content of the essay, and I'm on to the next paper.

Seeing the Bigger Picture

The full-blown, complete, graded essay is only one way to improve writing, and may not be the most effective if students merely glance at the comments, check the grade, and chuck the paper. I've tried forcing them to rewrite their papers, making all the noted edits, but this requires me to reread every essay and becomes more of a burden on me than on them. I have had more success with requiring students to write in their own words an explanation of why they received their grade. This I attach to the paper before it goes into their file.

Students who wish to improve, and who take the exercise seriously, can at least be made aware of what they have to work on. I also always offer to speak individually with them to explain how they can write better. Conferencing of this type, with paper in hand, is extremely effective, but it is of course time-consuming. Very few take me up on the offer, and I'm not sure how I'd handle it if more of them did.

Whenever I meet another teacher and tell him I teach English, he inevitably shakes his head sympathetically and says, "Oh, that's tough—you have all those papers to grade." I accept this pity graciously, understanding the intended kindness, but inside I'm seething. I have to bite my tongue to keep from blurting, "Why don't you have papers to grade?" What do we teach that cannot be expressed in words? Which of my fine colleagues received degrees in their particular disciplines without writing about the subject?

I recently spent virtually my entire winter break reading 120 8- to 10-page research papers that are a required part of our junior English classes. Nine out of 10 of these papers were on social studies topics, and the 10th dealt with science. None concerned literature, language, or anything else in my area of expertise. Hour after hour, day after day, paper after paper, I found my resentment growing. I thought about all the class time I had expended in teaching research methods, evaluating sources, and citing information, and how many things about American literature I had never gotten around to. It's not that I am against research; in fact, I think it should be a part of every class. But if there is any class where a research paper really belongs, that class is history, because research is what history is.* That is what historians do. Teaching history or any of the social sciences without teaching research is like teaching math without doing any problems.

Research, I am told by my colleagues, is not part of the California State Content Standards for history. This is not entirely true. The old standards call for high school students to "construct and test hypotheses; collect, evaluate, and employ information from multiple primary and secondary sources; and apply it in oral and written presentations." At my school, as far as I can tell, this is much more often applied to group posters and PowerPoint presentations than to individual research and writing. And when writing is used in these classes, mainly for exams, the teachers tell me they merely

*For more on the importance of history research papers, see "Meaningful Work: How the History Research Paper Prepares Students for College and Life," in the Winter 2011–2012 issue of *American Educator*, available at www.aft.org/pdfs/americaneducator/winter1112/Fitzhugh.pdf.

scan for key words and devote no part of the grade to how logically or clearly the information is presented.

In this regard, I have high hopes for the new Common Core State Standards, which call for students to "write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences." Note that this standard applies to history/social studies, science, and technical subjects, as well as English. Furthermore, certain standards—such as "Use precise language and **domain-specific vocabulary** to manage the complexity of the topic," and "Establish and maintain a formal style and objective tone while attending to the **norms and conventions of the discipline in which they are writing**" (emphasis added)—clearly spell out that we are now expected to do what we should have been doing all along: use writing to teach subject matter, and use subject matter to teach writing. In the meantime, the burden still falls disproportionately on us English teachers to make students express themselves coherently, and then to evaluate whether they've done it.

This brooding is not helping me, so I refocus on grading. After an hour or two, a strange thing happens: I start to enjoy myself. The papers don't improve exactly but a calm descends over me. I stop marking every single error, and when I do slash away with "Old Red," a sense of ironic detachment has displaced my former despondency. The same errors that enraged me begin to make me smile as I hear the students' personalities come through. Even the worst papers often have a sense of voice, albeit often inappropriate to the task at hand.

One of my students, a hulking young lad who came into the final with a solid 30 percent grade, nevertheless did take time to write the essay, an evaluation of a quote by Thoreau. His opening—"You want my opinion? YOU WANT ***MY*** OPINION!?"—made me laugh so hard I disturbed the patrons around me at the coffee shop where I was grading and woke the gentleman at a nearby table. It was impossible for me to read the line without seeing the young man's face.

I wouldn't say that my standards flag; it's just that I start to see the bigger picture. As public school teachers, we must take whatever students come our way and move them forward. And, although it's sometimes tough to see, they do improve. My school keeps writing portfolios of all our students. Sometimes, I look through the folder of one of my better writers and am amazed to see how poorly she wrote freshman year. And when I check the file of a poor writer, I often find that two years before she was a God-awful, horrible writer. Improvement is improvement.

Preparing to Write

Is it any surprise that the first step of writing is having something to say? *New York Times* columnist David Brooks tells his students at Yale that "by the time they sit down at the keyboard to write their essays, they should be at least 80 percent done. That's because 'writing' is mostly gathering and structuring ideas." Brooks calls his method, by the way, "geographical"—piles of notes scattered across a rug until he figures out a logical order for them.

Prewriting—whether through clustering, outlining, brainstorming, or pair-share discussion—helps students summon up what they have to say and come up with at least some idea of how to say it. Of course, it only works if they have the knowledge to back up their assertions. For a history paper, this means research; for a science paper, experimentation; for a literature essay, it means a close reading of the text. Only then, after gathering enough knowledge to have an opinion, after marshaling the requisite proof, is the student really ready to write.

Next comes drafting. The mantra is: "Just get it down on paper. Don't worry about spelling and grammar. We can fix it later." Anne Lamott, in her book *Bird by Bird: Some Instructions on Writing and Life*, makes a solid case for the shoddy first draft as a necessary part of the creative process. She warns against perfectionism, which she dubs "the voice of the oppressor." As a writer, I am completely hypocritical on this point. I tend to micromanage my own production, wordsmithing to a ridiculous degree, slashing at the backspace key again and again before I complete a simple paragraph. Still, I see the value in the approach, so when I see a student staring at the blank page as the appointed hour wears away, I sidle up to the desk and whisper, "Just get it down on paper. Don't worry about spelling and grammar. We can fix it later."

The Common Core State Standards spell out what we should have been doing all along: use writing to teach subject matter, and use subject matter to teach writing.

The next stage, revision, is the most difficult. Revision involves looking hard at one's writing to see if the objective has been met. Has the question been answered? Has the thesis been proven? Is there sufficient proof? Is the organization logical? In other words, is the paper clear?

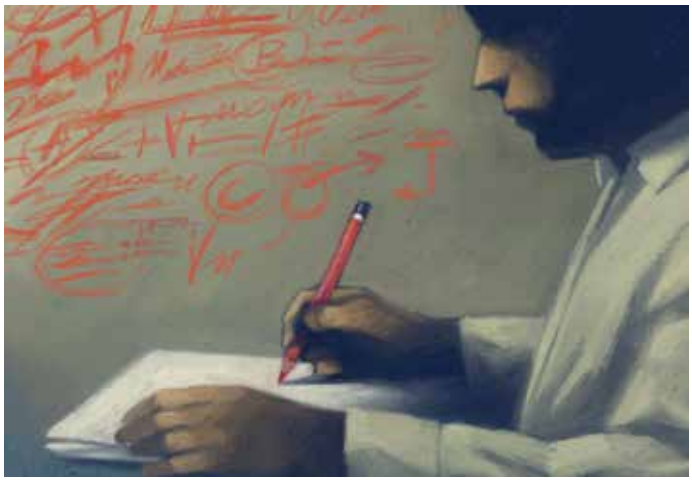
My students are used to assignments that are extremely prescriptive: a literature-based question neatly formulated to be answered with three main supports, hence with introduction and conclusion, the standard five-paragraph essay. This form, as ancient and versatile as the Pee Chee folder, achieved its apex with the advent of the Jane Schaffer Writing Program. In the 1990s, Schaffer further mechanized the writing process by breaking down the body paragraph into a specified series of concrete details (typically quotes from the text) and commentaries on those details. The result is neither exciting nor artistic, but it does provide a common language to use when speaking of revision.

Students can check their own or each other's papers by simply asking, "Are there two specific details per body paragraph?" "Are they correctly introduced?" "Do the comments show clearly how these details help to prove the thesis?"

When I meet college writing instructors, they invariably say, "The first thing I tell my class is, 'I'm going to unteach everything you learned in high school.'" I smile politely, and suppress the urge to argue. This old game persists at all levels of education:

we blame the teachers before us. I know we high school teachers like to mutter under our breath about the education our students get in middle school, and I have no doubt that the middle school teachers also sit around the staff room and gripe about how their students come to them knowing "absolutely nothing."

My students typically enter high school knowing three things about writing: first, that no sentence may begin with the word "because," second, that a paragraph is by definition five sentences long, and third, that they must begin an essay with a "grabber," usually in the form of a rhetorical question. They are nonplussed when I inform them that the first two are not true, and they are dumfounded when many of my colleagues flatly disallow beginning any essay with a question. I don't go as far as that, because the right question can in fact focus the reader's intentions. So when I hear the professors whine, I let it go. I know they mean the formulaic, five-paragraph essay. I know how dull these are, and how tightly students can cling to this formula, even when it does not apply.



Only after gathering enough knowledge to have an opinion, after marshaling the requisite proof, is the student really ready to write.

I also know these professors have never seen the stream-of-very-little-consciousness plot summary that is the first paper of the incoming ninth-grader. They have no idea of the labor it took to mold this inchoate mess into the formulaic writing they're complaining about. I teach the five-paragraph essay. I teach the Jane Schaffer method, and I have seen firsthand its power to create confident writers. It is true that it imposes an artificial structure, but it is a first step, and only a first step.

The Importance of Practice

In my district, we administer Performance-Based Assessments (PBAs) twice a year. These timed essays are read by two teachers, and the scores become part of the student's record. I'm proud to be part of a district that puts this emphasis on writing, as opposed to relying on another multiple-choice test, but it is a good example of how even a good assessment limits instruction. Because I know that my students' papers are going to be read by other teachers, and because that reflects on me, I feel pressure to bring my students in line with district expectations. For the most part, this is an excellent practice that has no doubt raised the overall writing level of our students.

On the other hand, practicing for the test takes up quite a bit of time that could be spent on other types of writing. I also know that anything that varies from the set standards will likely receive a poor score, even if it is clear and logical. Readers are looking for five paragraphs, with a thesis at the end of the first paragraph and topic sentences at the beginning of each body paragraph. A writer skillful enough to imply his thesis is likely to fail.

This is the tyranny of the test. To be fair, we do grade holistically against a rubric; it's not like the olden days when teachers just marked two points off for each spelling error, and minus five for each comma fault. Even so, to be reliable, tests must be uniform. To be considered important, results must be quantifiable. The data produced is indeed worthwhile, but we should be aware that not everything worthwhile is easily reducible to numbers on a chart. We run the risk of overvaluing anything that can be simply checked off and undervaluing everything that cannot.

For example, the year I came to my current school, the administration asked each department to provide three measurable goals for our students for the year. At my first department meeting, the first goal to make it on the list was, I kid you not, "M.L.A. (Modern Language Association) format." When I suggested that perhaps that wasn't one of our three main problems, I was told, "Yeah, but it has to be measurable." So voice, tone, style, syntax, and even clarity lost out to making sure our students know whether the period goes before or after the citation. Fortunately, like most directives from administration, this one had no effect whatsoever. The goals were written on a chart somewhere and never looked at again.

The first PBA that my freshmen face is the simplest. They must read a story and write an essay explaining how the character changes as a result of the challenges he or she faces. This is a perfect fit for ninth-graders learning how to write the classic five paragraphs. One body paragraph about the character in the beginning, one on the challenges faced, and one on the newly transformed person we see at the end of the story. Formulate an introduction and a conclusion, provide decent proof, and you've got yourself a passing paper.

Before they ever sit down to write their own attempt at this topic, I prepare them for this task by having them write a group essay as an entire class. The essay is based on an excerpt from *Black Boy* by Richard Wright. In this section, 6-year-old Richard must take charge of the family's shopping as his mother is gone all day working. At first pleased with this grown-up responsibility, Richard's pride soon turns to fear when he is attacked and robbed by a group of bigger

boys. He turns to his mother for comfort, but she refuses, instead giving him more money, a big stick, and instructions to return with the groceries or not at all. Forced to overcome his fears, Richard wields his club like a wild man, not only protecting himself from robbery but chasing the boys home and even threatening to beat their parents who come out to protect them. He writes, "On my way back I kept my stick poised for instant use, but there was not a single boy in sight. That night I won the right to the streets of Memphis."

The story is highly engaging and the transformation so clear that writing the essay is simple. First, I ask for words to describe Richard in the beginning: "scared," "mama's boy," "naive," "stupid," "typical little kid," etc. I write them all down on the board. "OK, now read over that part and find two quotes from the story that show he is scared or naive or a mama's boy." I have them mark the quotes in the story and then share with the person next to them. Each pair reads the best quote aloud until we have four or five to choose from.

Next, I seek descriptions of Richard at the end: "fearless," "crazy," "violent," "gangster," and so forth. Again, they repeat the process of finding good evidence from the text. We discuss which words are more effective and more accurate, and choose two adjectives and a noun from each list. I ask for words to describe the challenges that transform him: "fight," "anger," "stand up for himself," "mother."

Once I have their words, we can create a thesis. "In *Black Boy* by Richard Wright, a naive, scared mama's boy transforms into a fearless, violent gangster when his mother makes him stand up for himself." Besides telling them we need to mention the author and title, every word comes from them. Even if I disagree with them (for instance, whether any 6-year-old can be called a gangster), I bite my tongue and write it down. And that is how we proceed.

I type our essay into my computer and project it onto the screen. I make them copy it over by hand. These are ninth-graders after all, and most are simply incapable of paying attention for that long without having something to produce for "points." I control the pace and the process, but they control what I write.

"OK, what's our first body paragraph about?" I ask. "What he's like in the beginning," they shout back. "So what's he like?" We decide to write: "In the beginning of the story, Richard is just a typical 6-year-old." OK—that's our topic sentence—that's what this particular paragraph is about. Next, I ask for a quote that shows him as a typical little kid. They choose "I was proud; I felt like a grownup." "When was that?" I ask. "When his mom tells him he's going to the store alone," they tell me. I write: "When his mother tells him he is going to the store alone, Richard says 'I was proud; I felt like a grownup.'" I say, "See how I introduced the quote? OK, so why does that show he's a typical little kid?" After some discussion, they tell me that only a little kid would get excited about grocery shopping, and it also shows that he's a mama's boy who wants to impress his mother. These become our two commentary sentences.

These are "well-developed" paragraphs, seven to eight sentences each. Each body paragraph has two concrete details, in this case quotes from the text, with two sentences commenting on each one, explaining how the evidence proves the thesis. This process goes on and on until the students beg for mercy. Their hands are hurting. They've never written so much in their lives. When we've finished, we read it aloud and it's not half bad. It may not be immortal prose, but it's clear, coherent, and answers the prompt. Most important, if I've done it right and not given in to impatience, it is all their words.

I prove to the students that they already have enough insight and skill to speak about what the author accomplished and the effect he or she created.

When it comes time for them to write their own, I can project the file again and do a quick debrief. Remember writing this? What was this sentence here at the end of the first paragraph? Right, the thesis. How did we get that? Etc., etc., etc. Now you're going to do the same thing with a different story.

My idea is to demystify the process. By using their words, I prove to them that they, in fact, already have enough insight and skill to meet this new high school expectation, not just to retell the story, but to speak about what the author accomplished and the effect he or she created. In other words, they are writing about writing.

The next day, the training wheels are off; they're reading something brand new to them and writing about it. Facts are being misremembered, passages misinterpreted, and ideas misunderstood. Their grammar is as mangled as ever, their spelling just as creative. Some are struggling to recall the simple structure taught the day before. One or two are simply blinking at the terrible white sheet. "Just get it down on paper," I whisper to them. "Don't worry about spelling and grammar. You can fix it later."

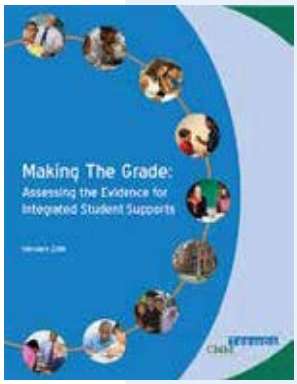
Class is quiet now, only the scritch-scratch of pen on paper. Their brows are furrowed. I can see they're struggling. Of course they are; they're writing. ❑

A Close Connection

THE LINKS BETWEEN education and lifelong health are stronger now than ever, according to a project of the Center on Society and Health at Virginia Commonwealth University. The center's Education and Health Initiative, funded by the Robert Wood Johnson Foundation, is an effort to raise awareness that Americans without a high school diploma experience poorer health and shorter life expectancy rates than their better-educated peers.

Between 1990 and 2008, the difference in life expectancy between the most- and least-educated Americans grew from 13 to 14 years among males and from 8 to 10 years among females. The center's report introducing the initiative states that this difference has been growing since the 1960s.

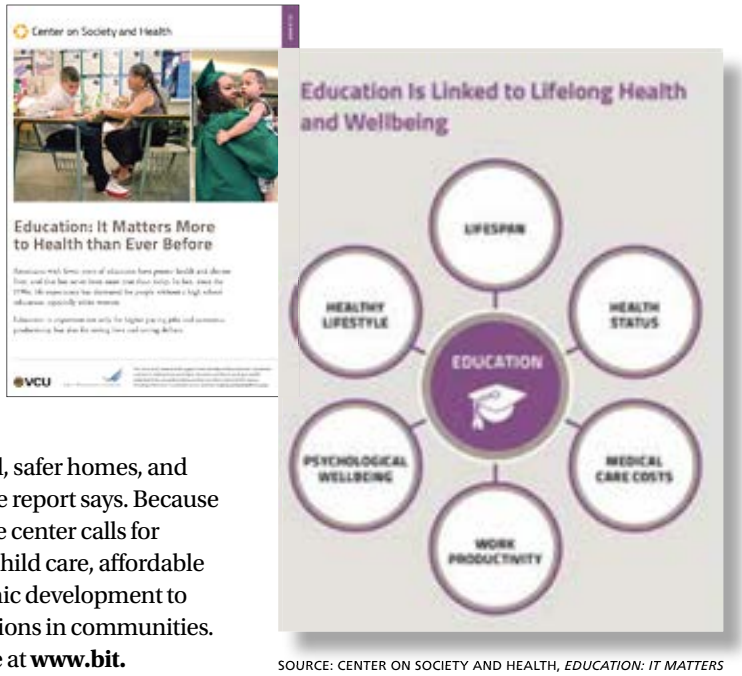
Major diseases, such as heart disease and diabetes, are also more likely to affect less-educated Americans. "By 2011, the prevalence of diabetes had reached 15 percent for adults without a high school education, compared with 7 percent for college graduates," the report states. In addition, risk factors, such as smoking and obesity, that contribute to disease are more likely to affect those with less education. The report states that by 2011, 27 percent of people without a high school diploma or GED reported smoking, but only 8 percent of those with a bachelor's degree were smokers.



When it comes to life expectancy among racial groups, differences persist. But "education—and the social factors associated with education—are transcending the influence of race on health," according to the report. African Americans with a college education live longer than whites with less than a high school education. Although highly educated African Americans (those with at least 16 years of education) live four years less than comparably educated whites, they can expect to live eight years longer than whites who have less than 12 years of education.

The report also notes increasing disparities in life expectancy among better- and less-educated whites. Between 1990 and 2008, among whites with less than 12 years of education, life expectancy at age 25 decreased by more than three years for men and by more than five years for women.

"More education leads to higher earnings that can provide access to healthy food, safer homes, and better health care," the report says. Because of this connection, the center calls for investments in early child care, affordable housing, and economic development to improve living conditions in communities. The report is available at **www.bit.ly/1dotLBW**.



SOURCE: CENTER ON SOCIETY AND HEALTH, *EDUCATION: IT MATTERS MORE TO HEALTH THAN EVER BEFORE*, PAGE 3.

The Promise of Community Schools

A REVIEW OF RESEARCH on community schools—schools that partner with outside groups to provide wraparound services to support the social, emotional, and health needs of students and their families—finds they have promise in helping low-income youth reach their potential.*

"School success (or failure) is the product of multiple and varied factors at the individual, family, and school levels," according to a white paper titled "Integrated Student Supports: A Summary of the Evidence Base for Policymakers," which is based on *Making the Grade: Assessing the Evidence for Integrated Student Supports*, a report published by Child Trends. "This suggests that providing an array of academic and non-academic supports in a coordinated fashion, as ISS does, is a more effective strategy than focusing on one, or a small set of, supports."

The white paper notes that integrated student supports (or ISS)—another name for the community schools approach—includes connecting students and their families to medical care, parent education, family counseling, food banks, and employment assistance, among other services. Such programs serve more than 1.5 million students, many of whom are at-risk, in nearly 3,000 schools nationwide. According to Child Trends, more than 75 percent of students enrolled in these programs are African American or Hispanic.

Based on 11 rigorous evaluations, this study finds that community schools "can contribute to student academic progress as measured by decreases in grade retention and dropout, and increases in attendance, math and reading achievement, and overall GPA."

The study also finds a positive return on investment in such programs, "ranging from more than $4 saved for every $1 invested to almost $15 saved for every $1 invested."

The white paper is available at **www.bit.ly/OtDfmx**, and the full report is available at **www.bit.ly/1p8tNjN**.

*For more on community schools, see the Summer 2009 issue of *American Educator*, "Surrounded by Support: Partnerships between Communities and Schools Connect Students with the Services They Need," available at www.aft.org/newspubs/periodicals/ae/summer2009/index.cfm.

SHARE MY LESSON SOARS IN POPULARITY

In less than two years, more than 500,000 teachers, parents, and others have used Share My Lesson, the free online resource created by the AFT and TES Connect, making it one of the most sought-out collections of lesson plans and resources. Winner of the Software & Information Industry Association's 2014 CODiE Award for Best Crowd Sourced Solution, Share My Lesson now offers more than 300,000 free lesson plans—including more than 31,000 materials aligned to the Common Core State Standards—along with videos, handouts, and teaching and parenting tips. More than 5.5 million resources have been downloaded from Share My Lesson, with a recent average of 10,000 downloads daily. Find out more at **http://go.aft.org/AE214news4**.

TOO SMALL TO FAIL IN TULSA

In March, community leaders in Tulsa, Oklahoma, joined with Too Small to Fail, a joint initiative of Next Generation and the Bill, Hillary & Chelsea Clinton Foundation, to launch a campaign that will help parents and caregivers of children ages 5 and under prepare their children for success in school and life. Called "Talking Is Teaching," the campaign will emphasize how simple actions like describing objects seen during a walk or bus ride, singing songs, or telling short stories a few times a day can significantly improve a baby's ability to learn new words and concepts. Tulsa has emerged as a national leader in early childhood education, and the campaign is being developed in partnership with local organizations. Read more at **www.bit.ly/1gMc40G**.

GROWING CONCERNS OVER COMMON CORE IMPLEMENTATION

The Learning First Alliance (LFA), which includes the AFT among its members, is calling on policymakers to allow more time for implementing the Common Core State Standards, particularly the high-stakes consequences tied to Common Core testing, to ensure the required instructional alignment and supports are provided. "Rushing to make high-stakes decisions such as student advancement or graduation, teacher evaluation, school performance designation or state funding awards based on assessments of the standards before they have been fully and properly implemented is unwise," the LFA statement says. More information is available at **http://go.aft.org/AE214news2**.

In spring 2013, the AFT called for a moratorium on assessment-driven sanctions tied to the Common Core standards until solid implementation plans are embedded in schools and after a year or more of field testing. Read the press release at **http://go.aft.org/AE214news3**.

WANTED: TESTING TRANSPARENCY

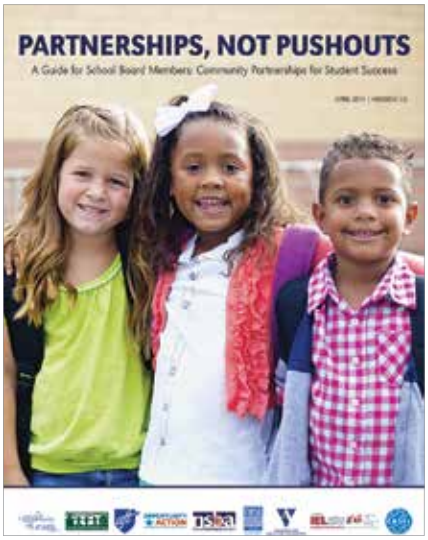
AFT President Randi Weingarten pressed the corporate testing giant Pearson to remove "gag orders" preventing educators from expressing concerns about company-developed tests. "Principals and teachers in New York who recently administered the Pearson-developed Common Core tests have said they are barred from speaking about the test content and its effects on students," reported Weingarten. She said the forced silence comes from contracts tied to the tests that are executed by Pearson, the largest testing company in the world. In a letter hand-delivered to Pearson executives in London during the company's annual shareholder meeting, the AFT demanded that the company "immediately remove these prohibitions (referred to as 'gag orders' in the press) from existing and future contracts." The letter is available at **http://go.aft.org/AE214news1**.

INSIDE THE "BLACK BOX"

Good teachers are receiving poor evaluations because of a grossly flawed value-added algorithm that should be changed, seven Houston teachers and the Houston Federation of Teachers said May 1 in an unprecedented lawsuit filed in a federal district court. The lawsuit details numerous problems with the Houston Independent School District's Education Value-Added Assessment System. Its statistical formula uses a student's performance on prior standardized tests to predict current-year academic growth and to measure the effect, or added value, each teacher has on a student's academic growth over the school year. What is considered a sufficient level of student growth is not defined, however, and the school district uses this deeply flawed methodology for decisions about teacher evaluation, bonuses, and termination in a "black box" system in which the calculation is considered proprietary and confidential. The legal brief can be found at **http://go.aft.org/AE214news5**.

PARTNERSHIPS FOR STUDENT SUCCESS

The AFT has joined a broad coalition of education groups to release a blueprint for better-coordinated support systems for all children in public schools. "Partnerships, Not Pushouts—A Guide for School Board Members: Community Partnerships for Student Success" lays the groundwork for policy recommendations, including the use of community school resource coordinators to develop "Personal Opportunity Plans" for each student. Members of the coalition include the Alliance for Excellent Education; the Collaborative for Academic, Social, and Emotional Learning (CASEL); the Coalition for Community Schools; the National Education Association; the National School Boards Association; Opportunity Action; the National Opportunity to Learn Campaign; and the Rural School and Community Trust. More information is available at **www.bit.ly/QvvzRL**.



Spend Some of Your Summer with Share My Lesson

As the school year comes to a close, we know that many of you will be reflecting on how things went, taking a well-deserved vacation, and then getting right back in the groove to prepare for the fall. Whenever you're ready, Share My Lesson offers access to thousands of free resources and a community of colleagues. Just follow these steps, and you'll be well on your way:

1. Register on ShareMyLesson.com

If you aren't registered on Share My Lesson, you should be! More than a half-million people who work with students are registered on the site, sharing resources with each other. Registering is quick and easy. Just go to **ShareMyLesson.com**, click on the red "Join Us" button, and fill out the form.

2. Search for resources

Once you're registered, start browsing. You'll find various resources covering all subjects and grades. If it is your first visit to the site, you might find it helpful to start with the Teacher Care Packages (**www.bit.ly/PXdonf**), which showcase users' favorite resources. Care Packages include links to the Common Core State Standards (CCSS), resources that are aligned to each of the standards, and lesson plans for teaching specific celebrations, heritage months, and historic events. Care Packages are regularly updated to reflect new additions. Be sure to bookmark this page and visit it often!

Interested in resources about the Common Core? In addition to CCSS-aligned classroom materials, Share My Lesson houses a wealth of professional development materials for teachers looking to learn more about these standards. You'll find the standards themselves, sample assessment questions, webinars (**www.bit.ly/Sh7fEF**) with education researchers and experts, sample parent letters (**www.bit.ly/1kB4vuL**), and more. To see the full range of available materials, check out the Common Core Information Center (**www.bit.ly/1kB4KpQ**).

3. Share your resources

Do you have a favorite lesson or worksheet? Share it on Share My Lesson. It's easy: log on to Share My Lesson, click on "Teaching Resources," click on "Add a Resource" at the top of the page, fill out the form, upload your resource, and hit "Save." It is really that simple.

Summer break is a great time to take a close look at the materials you've prepared and get them ready for others to use as well. One AFT member likened the sharing process to getting ready for an open house. You find yourself wanting to make your resource more attractive and/or user-friendly for the next person who wants to download and use it.

FUN SUMMER CHECKLIST

- Travel
- Read some books
- Relax
- ✓ **Explore Share My Lesson!**
- Catch up on movies
- Buy more sunscreen
- Make popsicles
- Go hiking
- Do some gardening

4. Become a Share My Lesson ambassador

Members across the country are signing up to be ambassadors of Share My Lesson. Ambassadors spread the word about this terrific website through social media, blog posts, and conference presentations, and they review resources for alignment to the Common Core and help with the development of new sections of the website (two recent additions cover early childhood education and STEM education).

Much of this development work occurs through weekend events where members brainstorm ideas for the website, share lessons, learn how to assess whether a lesson plan aligns with the Common Core, and review and rate resources.

Attendees have said that these events are both fun and professionally engaging; many have noted they are among the best professional development they've ever received. Read about one member's experience on the AFT's new "Voices from the Classroom" blog at **www.bit.ly/RbdZTk**.

Interested in becoming a Share My Lesson ambassador? Just send an email to **share@aft.org**.

Sixty-six teachers attended the February 2014 Share My Lesson marathon in Denver, Colorado. Larry Bello and Carlos Vargas, from the Perth Amboy Federation, are shown on the right; Bobbi Jo Rademacher, from the Saint Paul Federation of Teachers, is shown below.

PHOTOGRAPHS BY AFT STAFF

Transitioning to Kindergarten:

A Toolkit for Early Childhood Educators

As documented throughout these pages, research clearly shows the importance of early education to student learning. We all want to provide children with strong educational and social experiences well before kindergarten and formal schooling even begin. An early start, after all, gives students the best possible chance to succeed.

The AFT and the National Center for Learning Disabilities have created a toolkit to help educators implement strategies as their students make the transition to kindergarten. Whether you are a school administrator, early childhood professional, paraprofessional, child care provider, or kindergarten teacher, you will find practical, easy-to-use resources to engage students and parents alike.

Highlights of this toolkit include:

- **School Readiness** (**http://go.aft.org/AE214tft1**)
  How do you know if a child is ready for kindergarten? The time that you spend with a child every day can give you lots of information about how he or she is progressing. This section contains a helpful guide on creating an "Early Learning Passport," a kindergarten readiness indicators checklist, an observation and activity guide, and a template for drawing and writing.

ILLUSTRATION BY JAMES YANG

- **Get Ready to Read!** (**http://go.aft.org/AE214tft2**)
  The *Get Ready to Read!* Screening Tool is intended to provide early childhood professionals and parents with a snapshot of where a child is on the path to developing important early literacy skills, including print knowledge, linguistic awareness, and emergent writing.
- **For Parents** (**http://go.aft.org/AE214tft3**, and **http://go.aft.org/AE214tft4** in Spanish)
  This section guides parents through the process of sharing what they know about their child with the kindergarten teacher, including noting any special services the child is receiving. It gives parents the opportunity to pass along important information about the child's likes and dislikes, the child's strengths and weaknesses, and any early warning signs that may have been observed.

–FROM THE AFT'S EDUCATIONAL ISSUES DEPARTMENT

RESOURCES

LISTEN CAREFULLY

A website designed to help parents encourage their children to practice safe listening habits when using headphones and iPods also provides resources for teachers looking to educate students about the damaging effects of hearing loss. As part of its "Listen to Your Buds" public education campaign, the American Speech-Language-Hearing Association (ASHA) has created lesson plans and classroom activities, available at **www.asha.org/Buds/Lesson-Plans**, that remind students to turn down the volume and take listening breaks when using personal audio devices.

As the site makes clear, hearing loss can contribute to academic, language, and social problems in school. To that end, ASHA has compiled several classroom resources on noise-induced hearing loss. These include "How Your Brain Understands What Your Ear Hears," a curriculum supplement for grades 7 and 8 that explains the connections between hearing, language, and communication; "I Love What I Hear!," which features classroom activities for grades 3–6 to help students learn how to protect their hearing and understand the science of sound; and "Dangerous Decibels," a curriculum supplement for grades K–8 with activities for learning the anatomy and physiology of hearing and how to practice healthy behaviors for preventing hearing loss due to unsafe sound.

WHAT'S UP WITH THE WEATHER?

A vast array of information for science teachers looking to supplement lessons at a variety of grade levels has been compiled by the National Oceanic and Atmospheric Administration and is available at **www.education.noaa.gov**. The site is filled with free lesson plans and activities on a range of topics, including wildfires, climate science, thunderstorms, blizzards, hurricanes, tornadoes, ocean currents, and environmental issues in the Great Lakes, along with detailed explanations of scientific concepts.

For instance, a resource on "Weather Systems and Patterns" includes a "Toasty Wind Lab" lesson in which elementary and middle school teachers can use a toaster "to show how infrared radiation produces convection currents and wind." Another lesson for middle school students helps them understand air pressure, temperature, dew point, and pressure readings on a weather map, while a lesson for both middle and high school students examines air masses, weather systems, and forecasting.

The site also includes background information on each topic. For example, "pressure systems," "meteorological processes," and "severe weather" are important terms for students to know as they study weather systems and patterns. For students curious about careers in the field, the site provides links to video profiles of tornado chasers and hurricane hunters.

Starting Off Strong

(Continued from page 18)

19. Hart and Risley, *Meaningful Differences*; and Paul Tough, *Whatever It Takes: Geoffrey Canada's Quest to Change Harlem and America* (Boston: Houghton Mifflin, 2008), 105–107.

20. David Grissmer, Kevin J. Grimm, Sophie M. Aiyer, William M. Murrah, and Joel S. Steele, "Fine Motor Skills and Early Comprehension of the World: Two New School Readiness Indictors," *Developmental Psychology* 46 (2010): 1008–1017.

21. E. D. Hirsch Jr., "Reading Comprehension Requires Knowledge—of Words and the World," *American Educator* 27, no. 1 (Spring 2003): 10–29, 48; Willingham, "How Knowledge Helps"; and Susan B. Neuman, "Sparks Fade, Knowledge Stays: The National Early Literacy Panel's Report Lacks Staying Power," *American Educator* 34, no. 3 (Fall 2010): 14–17, 39.

22. The Common Core State Standards recognize the reciprocal relationship between reading and content knowledge: "By reading texts in history/social studies, science, and other disciplines, students build a foundation of knowledge in these fields that will also give them the background to be better readers in all content areas. Students can only gain this foundation when the curriculum is intentionally and coherently structured to develop rich content knowledge within and across grades." Common Core State Standards Initiative, *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects* (Washington, DC: Common Core State Standards Initiative, 2010), 10, www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf.

23. Vocabulary and knowledge acquisition are also closely related to each other. Most vocabulary is learned in context, not memorized from word lists. Knowledge acquisition is essential for helping students understand the context. In addition, many words and phrases (e.g., "democracy") are tied to whole bodies of knowledge, only a small fraction of which is conveyed by their dictionary definitions.

24. For example, studies of New York City charter schools (Hoxby and Murarka) and of KIPP middle schools (Tuttle et al.) found stronger school effects in mathematics than in reading. Caroline M. Hoxby and Sonali Murarka, "New York City Charter Schools: How Well Are They Teaching Their Students?," *Education Next* 8, no. 3 (2008): 54–61; and Christina Clark Tuttle, Bing-ru Teh, Ira Nichols-Barrer, Brian P. Gill, and Philip Gleason, *Student Characteristics and Achievement in 22 KIPP Middle Schools: Final Report* (Washington, DC: Mathematica Policy Research, 2010). Scores on the eighth-grade National Assessment of Educational Progress have risen more in mathematics than in reading. E. D. Hirsch Jr., "Narrowing the Two Achievement Gaps," *Core Knowledge Blog* (blog), November 9, 2007, http://blog.coreknowledge.org/2007/11/09/narrowing-the-two-achievement-gaps; and National Center for Education Statistics, "NAEP Data Explorer," www.nces.ed.gov/nationsreportcard/naepdata.

25. Daniel T. Willingham, *Why Don't Students Like School? A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom* (San Francisco: Jossey-Bass, 2009).

26. Daniel T. Willingham, "The Usefulness of *Brief* Instruction in Reading Comprehension Strategies," *American Educator* 30, no. 4 (Winter 2006–2007): 39–45, 50.

27. E. D. Hirsch Jr., *The Knowledge Deficit* (New York: Houghton Mifflin, 2006).

28. ACT, *Impact of Cognitive, Psychosocial, and Career Factors on Educational and Workplace Success* (Iowa City, IA: ACT, 2007); and Richard Sawyer and Neal Gibson, *Exploratory Analyses of the Long-Term Effects of Improving Behavior, Attendance, and Educational Achievement in Grades 1–6 and 8–12*, ACT Research Report Series (Iowa City, IA: ACT, 2012), www.act.org/research/researchers/reports/pdf/ACT_RR2012-3.pdf.

29. Adele Diamond, W. Steven Barnett, Jessica Thomas, and Sarah Munro, "Preschool Program Improves Cognitive Control," *Science* 318, no. 5855 (November 30, 2007): 1387–1388.

30. Joseph A. Durlak, Roger P. Weissberg, Allison B. Dymnicki, Rebecca D. Taylor, and Kriston B. Schellinger, "The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Early Interventions," *Child Development* 82 (2011): 405–432.

31. Linda Perlstein, "School Pushes Reading, Writing, Reform: Sciences Shelved in Effort to Boost Students to 'No Child' Standards," *Washington Post*, May 31, 2004; Linda Perlstein, *Tested: One American School Struggles to Make the Grade* (New York: Henry Holt & Company, 2007); and Common Core, *Learning Less: Public School Teachers Describe a Narrowing Curriculum* (Washington, DC: Common Core, 2012).

32. Daniel T. Willingham, "What Is Developmentally Appropriate Practice?," *American Educator* 32, no. 2 (Summer 2008): 34–39.

33. Diane Ravitch, "Tot Sociology: Or What Happened to History in the Grade Schools," *American Scholar* 56, no. 3 (Summer 1987): 343–354; Diane Ravitch, *Left Back: A Century of Failed School Reforms* (New York: Simon & Schuster, 2000); and Brian Frazee and Samuel Ayres, "Garbage In, Garbage Out: Expanding Environments, Constructivism, and Content Knowledge in Social Studies," in *Where Did Social Studies Go Wrong?*, ed. James Leming, Lucien Ellington, and Kathleen Porter-Magee (Washington, DC: Thomas B. Fordham Institute, 2003), 111–123.

34. If science content were similarly restricted, then the study of dinosaurs, ocean life, volcanoes, and other things not in the students' immediate environment would be removed from the curriculum in kindergarten through third grade.

35. E. D. Hirsch Jr., "'You Can Always Look It Up' … or Can You?," *American Educator* 24, no. 1 (Spring 2000): 4–9; and Robert Pondiscio, "21st Century Skills and the Tree Octopus Problem," *Core Knowledge Blog* (blog), February 5, 2009, http://blog.coreknowledge.org/2009/02/05/21st-century-skills-and-the-tree-octopus-problem.

36. For example, most readers are unqualified to practice medicine despite the vast array of medical knowledge available on the Internet and in readily accessible reference books.

37. Daniel T. Willingham, "Teaching Content Is Teaching Reading," YouTube video, 9:58, posted by "Daniel Willingham," January 9, 2009, www.youtube.com/watch?v=RiP-ijdxqEc.

38. Jennifer Dubin, "More Than Words: An Early Grades Reading Program Builds Skills and Knowledge," *American Educator* 36, no. 3 (Fall 2012): 34–40; and Research and Policy Support Group, *Evaluating the NYC Core Knowledge Early Literacy Pilot: Years 1–3 Overview* (New York: New York City Department of Education, n.d.).

39. ACT, *Core Practice Framework*; and ACT, *Rising to the Challenge*. To learn more about the ACT Core Practice Framework, which identifies the successful practices of high-performing schools, see www.act.org/products/additional-products-assessments/act-core-practice-framework.

40. ACT, *Core Practice Framework*; and ACT, *Rising to the Challenge*.

Elementary Curriculum Content

(Continued from page 23)

Endnotes

1. National Commission on Excellence in Education, *A Nation at Risk: The Imperative for Educational Reform* (Washington, DC: U.S. Department of Education, 1983).

2. "Credit Requirements and Exit Exam Requirements for a Standard High School Diploma and the Use of Other High School Completion Credentials, by State: 2011 and 2012," in National Center for Education Statistics, *Digest of Education Statistics*, 2012, table 199; and "State Requirements of High School Graduation, in Carnegie Units: 1980 and 1993," in National Center for Education Statistics, *Digest of Education Statistics*, 1996, table 152.

3. Center on Education Policy (CEP), *State High School Exit Exams: Trends in Test Programs, Alternate Pathways, and Pass Rates* (Washington, DC: CEP, 2009), 16; and Center on Education Policy (CEP), *State High School Tests: Changes in State Policies and the Impact of the College and Career Readiness Movement* (Washington, DC: CEP, 2011), 4.

4. "Average Number of Carnegie Units Earned by Public High School Graduates in Various Subject Fields, by Sex and Race/Ethnicity: Selected Years, 1982 through 2009," in National Center for Education Statistics, *Digest of Education Statistics*, 2011, table 159.

5. Iris R. Weiss, *Report of the 1977 National Survey of Science, Mathematics, and Social Studies Education* (Research Triangle Park, NC: Center for Educational Research and Evaluation, 1978), table 25, www.horizon-research.com/2012nssme/wp-content/uploads/2013/02/1977-Report.pdf.

6. Perhaps this inattention to other subjects was not such a great loss, considering the often trivial quality of the little that was offered. Diane Ravitch reported in 1987 in *The American Scholar* on the state of the elementary social studies curriculum: "[T]here exists a national curriculum in the social studies. Regardless of the state or the school district, children in kindergarten and the first three grades study home, family, neighbors, and the local community." Yet this curriculum "is virtually content-free. … It contains no mythology, legends, biographies, hero tales, or great events in the life of this nation or any other. It is tot sociology"—known more popularly in the education world as "expanding horizons." Diane Ravitch, "Tot Sociology: Or What Happened to History in the Grade Schools," *American Scholar* 56, no. 3 (Summer 1987): 343–354.

7. William H. Schmidt, Jacqueline Caul, Joe L. Byers, and Margret Buchmann, *Educational Content of Basal Reading Texts: Implications for Comprehension Instruction*, Research Series, no. 131 (East Lansing, MI: Institute for Research on Teaching, Michigan State University, 1983), 10.

8. Schmidt et al., *Educational Content*, 16.

9. For example, see Thomas B. Fordham Institute, *The State of State Science Standards 2012* (Washington, DC: Thomas B. Fordham Institute, 2012); and Sheldon M. Stern and Jeremy A. Stern, *The State of State U.S. History Standards 2011* (Washington, DC: Thomas B. Fordham Institute, 2011).

10. Kate Walsh, "Basal Readers: The Lost Opportunity to Build the Knowledge That Propels Comprehension," *American Educator* 27, no. 1 (Spring 2003): 24.

11. Eric R. Banilower et al., *Report of the 2012 National Survey of Science and Mathematics Education* (Chapel Hill, NC: Horizon Research, 2013), table 4.2, www.horizon-research.com/2012nssme/research-products/reports/technical-report; Iris R. Weiss, Eric R. Banilower, Kelly C. McMahon, and P. Sean Smith, *Report of the 2000 National Survey of Science and Mathematics Education* (Chapel Hill, NC: Horizon Research, 2001), table 4.3, http://2000survey.horizon-research.com; and Weiss, *Report of the 1977 National Survey*, table 25.

12. See Common Core, "Learning Less: Public School Teachers Describe a Narrowing Curriculum," complete survey findings, http://commoncore.org/maps/documents/reports/CommonCore-FDR-CompleteFindings-111208.pdf. The figures cited here are from cross-tabulations that are not included in the public report or published dataset but were provided by Common Core.

13. It is important to note that 53 percent of these elementary teachers believe that, as a result of the extra attention and resources to English and math instruction, student learning in one or both of these subjects has "improved." These teachers are not saying that the English/math focus is an unmitigated disaster or a waste of time. Rather, they are saying that there are serious tradeoffs. These tradeoffs exist at all grades but are most palpable and extreme at the elementary level, where a single teacher is typically responsible for addressing all the subjects—English and math, plus all the rest. "All the rest" simply does not get a lot of attention in American elementary schools.

Taken for Granted

(Continued from page 27)

Endnotes

1. Grover J. "Russ" Whitehurst, "Don't Forget Curriculum," Brown Center Letters on Education, Brookings Institution, October 2009.

2. Matthew M. Chingos and Grover J. "Russ" Whitehurst, *Choosing Blindly: Instructional Materials, Teacher Effectiveness, and the Common Core* (Washington, DC: Brookings Institution, 2012).

3. Daniel T. Willingham, "Ask the Cognitive Scientist: What Is Developmentally Appropriate Practice?," *American Educator* 32, no. 2 (Summer 2008): 34–39. See also Daniel T. Willingham, "Do We Underestimate Our Youngest Learners?," *RealClearEducation*, March 11, 2014; Deborah Kelemen, Natalie A. Emmons, Rebecca Seston Schillaci, and Patricia A. Ganea, "Young Children Can Be Taught Basic Natural Selection Using a Picture-Storybook Intervention," *Psychological Science* 25 (2014): 893–902; Caren M. Walker and Alison Gopnik, "Toddlers Infer Higher-Order Relational Principles in Causal Learning," *Psychological Science* 25 (2014): 161–169; and Emma Flynn and Robert Siegler, "Measuring Change: Current Trends and Future Directions in Microgenetic Research," *Infant and Child Development* 16 (2007): 135–149.

4. To read more from Jena Peluso, as well as quotes from other teachers using Core Knowledge Language Arts, see www.bit.ly/1mFUHQs.

5. Heidi Cole, "Children Are Curious and Capable—and Teachers Should Be Too," *Core Knowledge Blog* (blog), September 26, 2013, http://blog.coreknowledge.org/2013/09/26/children-are-curious-and-capable-and-teachers-should-be-too.

6. E. D. Hirsch Jr., "Sustaining the American Experiment," in *Knowledge at the Core: Don Hirsch, Core Knowledge, and the Future of the Common Core*, ed. Chester E. Finn Jr. and Michael J. Petrilli (Washington, DC: Thomas B. Fordham Institute, 2014), 7–14.

Cognitive Scientist

(Continued from page 32)

15. Maloney and Beilock, "Math Anxiety."

16. Sian L. Beilock, Elizabeth A. Gunderson, Gerardo Ramirez, and Susan C. Levine, "Female Teachers' Math Anxiety Affects Girls' Math Achievement," *Proceedings of the National Academy of Sciences of the United States of America* 107 (2010): 1860–1863.

17. Erin A. Maloney, Elizabeth A. Gunderson, Gerardo Ramirez, Susan C. Levine, and Sian L. Beilock, "Teachers' Math Anxiety Relates to Girls' and Boys' Math Achievement" (unpublished manuscript, 2014).

18. Susan C. Levine, Linda Whealton Suriyakham, Meredith L. Rowe, Janellen Huttenlocher, and Elizabeth A. Gunderson, "What Counts in the Development of Young Children's Number Knowledge?," *Developmental Psychology* 46 (2010): 1309–1319; and Shannon M. Pruden, Susan C. Levine, and Janellen Huttenlocher, "Children's Spatial Thinking: Does Talk about the Spatial World Matter?," *Developmental Science* 14 (2011): 1417–1430.

19. D. James Tooke and Leonard C. Lindstrom, "Effectiveness of a Mathematics Methods Course in Reducing Math Anxiety of Preservice Elementary Teachers," *School Science and Mathematics* 98 (1998): 136–139.

20. Michael W. Faust, Mark H. Ashcraft, and David E. Fleck, "Mathematics Anxiety Effects in Simple and Complex Addition," *Mathematical Cognition* 2 (1996): 25–62.

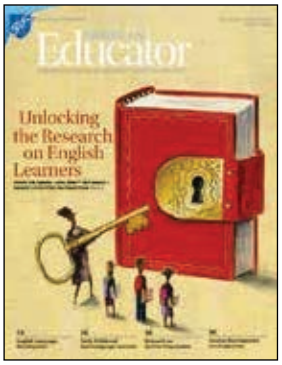
21. Daeun Park, Gerardo Ramirez, and Sian L. Beilock, "The Role of Expressive Writing in Math Anxiety," *Journal of Experimental Psychology: Applied* (forthcoming), published electronically April 7, 2014, doi:10.1037/xap0000013.

22. Joanne Frattaroli, Michael Thomas, and Sonja Lyubomirsky, "Opening Up in the Classroom: Effects of Expressive Writing on Graduate School Entrance Exam Performance," *Emotion* 11 (2011): 691–696.

23. Gerardo Ramirez and Sian L. Beilock, "Writing about Testing Worries Boosts Exam Performance in the Classroom," *Science* 331, no. 6014 (January 14, 2011): 211–213.

24. For the complete writing prompts, see Park, Ramirez, and Beilock, "Role of Expressive Writing in Math Anxiety"; and Ramirez and Beilock, "Writing about Testing Worries."

25. Aneeta Rattan, Catherine Good, and Carol S. Dweck, "'It's OK—Not Everyone Can Be Good at Math': Instructors with an Entity Theory Comfort (and Demotivate) Students," *Journal of Experimental Social Psychology* 48 (2012): 731–737.



Summer 2013

Unlocking the Research on English Learners
By Claude Goldenberg

English Language Development
By William Saunders, Claude Goldenberg, and David Marcelletti

Dual Language Learners
By Claude Goldenberg, Judy Hicks, and Ira Lit

Lighting the Way: Teacher Preparation
By Robert Rickenbrode and Kate Walsh

The Professional Educator: Teacher Development and Evaluation
By Vicki Phillips and Randi Weingarten

Fall 2013

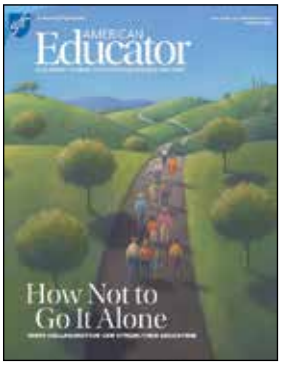
Letting the Text Take Center Stage
By Timothy Shanahan

Study Strategies to Boost Learning
By John Dunlosky

Labor's Role in the March on Washington
By William P. Jones

Key Figures behind the March
By Charles Euchner

Two Civil Rights Activists Remember the March on Washington
By Norman Hill and Velma Murphy Hill



Winter 2013–2014

Cultivating Collaboration
By Greg Anrig

Banding Together to Improve Student Achievement
By David L. Kirp

Strengthening Partnerships
By Saul A. Rubinstein

Moving Meriden
By Jennifer Dubin

The Bargaining Table and Beyond
By Phil Kugler

Spring 2014

One Piece of the Whole
By Linda Darling-Hammond

Using Teacher Feedback to Bolster Evaluation
By Ross Wiener and Kasia Lundy

The Professional Educator: Teacher Evaluation
By David Cicarella

The Mind Shift in Teacher Evaluation
By Angela Minnici

Minding the Knowledge Gap
By Daisy Christodoulou

Promethean Summer
By Jennifer Dubin

These issues are available at **www.aft.org/ae**.

AFT Subscription Services

No Gimmicks... Just the Lowest Prices!

A Union of Professionals

AFT+ Member Benefits

Box 258, Greenvale, NY 11548
www.buymags.com/aft

Serving AFT members for over 30 years!

1-800-774-9162

Purchase or renew **The Economist**. Print edition only $77.00 for 51 issues. **NOW** enjoy **PRICE DROPS** on the Digital and Print/Digital Bundle.

Price Drops! Digital & Print/Digital Bundle

The Economist - Print	127.00	77.00*
The Economist - Digital	127.00	77.00
The Economist - Print & Digital	160.00	96.00

Discounted Magazines WWW.BUYMAGS.COM/AFT

	Usual Price	Your Price
Allure	16.00	12.00*
Architectural Digest	42.00	24.00*
Arthritis Today	30.00	9.95
The Atlantic	29.95	24.95
Automobile	19.94	10.00
Autoweek	32.00	19.95
Better Homes & Gardens 1 yr	22.00	14.97
2 yrs	44.00	22.00

Birds & Blooms	17.98	17.98
Bloomberg Businessweek	59.97	40.00
Bon Appetit	28.00	20.00*
Car and Driver	22.00	12.00
Cat Fancy	24.00	15.00
Conde Nast Traveler	19.97	12.00
Consumer Reports	29.00	29.00
CR Money Adviser	29.00	29.00
Cook's Illustrated	29.70	24.95
Cooking Light	20.00	20.00
Cosmopolitan	29.97	18.00*
Country Living	24.00	12.00
Glamour	18.00	12.00*
Golf	19.95	15.00
Golf Digest	27.94	14.97
Good Housekeeping 1 yr	23.97	12.00
2 yrs	39.94	24.00
GQ	20.00	15.00*
Harper's Bazaar	18.00	15.00
Harper's Magazine	21.00	11.97
Health Magazine	39.94	15.97
HGTV	28.00	28.00
House Beautiful	19.97	15.00
Instructor (K-8)	19.95	8.00
InStyle	24.00	19.50*
Kiplinger's Personal Finance	23.95	12.00
Kiplinger's Retirement Report	59.95	39.95
Latina	17.97	9.97
Lucky	20.00	12.00
Marie Claire	19.97	12.00
Martha Stewart Living	28.00	24.00
Men's Health	24.94	24.94*
Men's Journal	19.97	14.95
mental floss	32.00	28.00
Midwest Living	19.97	11.97
Money	39.89	19.95*
More Magazine	18.00	14.97
Mother Earth News	19.95	14.95
Motor Trend	18.00	10.00
The Nation [47 issues]	52.00	26.00
National Geographic	39.00	39.00
National Geographic Traveler	19.97	19.97
New York 1 yr	27.35	19.97
2 yrs	55.02	37.97
New York Review Of Books	74.95	74.95
The New Yorker 1 yr	69.99	69.99
2 yrs	139.98	139.98
Newsweek- Print	149.99	99.99
O Oprah	28.00	24.00
Old House Journal	21.97	21.97
Outdoor Photographer	19.94	19.94
Parents	15.98	9.97
People	56.94	56.94
Redbook	24.00	12.00
Road & Track	22.00	12.00
Rolling Stone	29.95	29.95
Runner's World	24.00	20.00*
Saveur	29.95	19.95
Scientific American	34.97	24.97
Scientific American Mind	19.95	14.95
Self	17.97	12.00*
Seventeen	19.95	12.00
Shape	24.00	14.97
Smithsonian	34.00	12.00
Southern Living	36.00	24.00
Traditional Home	24.00	24.00
Travel & Leisure	45.00	19.00
TV Guide	58.14	39.00
Us Weekly	69.96	59.97
Vegetarian Times	19.95	7.00
Veranda	24.00	20.00
Vogue	29.95	17.97
Washingtonian	29.95	18.00
The Week	75.00	59.50
The Weekly Standard	79.96	47.96
Weight Watchers	17.70	14.95
Wine Enthusiast	35.00	26.95
Wired	24.00	12.00
Woman's Day	18.00	18.00
Women's Health	17.97	14.97*
Working Mother	12.97	9.97
Yoga Journal	21.95	10.95

$15.00 and Under!

Allure	$12.00
Better Homes & Gardens	$14.97
Conde Nast Traveler	$12.00
Ebony	$11.97
ESPN	$13.00
Golf	$15.00
Good Housekeeping	$12.00
Harper's Magazine	$11.97
House Beautiful	$15.00
Kiplinger's Personal Finance	$12.00
Reader's Digest	$13.96

Newsweek

Back and better than ever!

Print Edition only $99.99

Lock in this Great Rate!

Call to place an order: Mon.-Thur. 9 am - 6 pm & Fri. 9 am - 5 pm ET. **1-800-774-9162**

Cruise Travel	44.95	23.94
Discover 1 yr	29.95	19.95
2 yrs	59.90	29.95
Dog Fancy	24.00	13.00
Dr.Oz The Good Life	24.00	20.00
Ebony	20.00	11.97
Elle	28.00	14.00
Elle Decor	29.00	15.00
Entertainment Weekly	39.95	34.95*
ESPN	26.00	13.00
Esquire	15.94	8.00
Essence	22.00	18.96
Family Circle	19.98	15.00
Family Fun	16.95	9.97
Family Handyman	24.00	15.00
Fitness	19.98	14.97
Food Network	30.00	20.00
Food & Wine	39.00	19.00
Forbes	59.95	24.95
Foreign Affairs	44.00	32.00
Fortune	59.95	29.98*
Popular Mechanics	24.00	24.00
Popular Photography	24.00	11.97
Popular Science	19.95	12.00
Prevention	24.00	24.00*
Psychology Today	21.00	20.00
Reader's Digest	24.98	13.96
Large print edition	27.96	21.95
Real Simple	28.95	24.00*
Sports Illustrated	89.04	39.95*
Sports Illustrated For Kids (ages 8-14)	31.95	31.95
Sunset	24.00	15.00
Texas Monthly	18.00	12.00
This Old House	20.00	20.00
Time [53 iss]	59.95	29.95*
Time Out - New York	39.94	19.97
Town & Country	24.00	15.00

Hundreds of Other Titles!

WWW.BUYMAGS.COM/AFT

*Rate for members and college students

AFT SUBSCRIPTION SERVICES, Box 258, Greenvale, NY 11548

Name_____

Address_____

City, State, ZIP_____

Email _____

Your School_____

Home Phone (____)_____

FREE gift announcement! - CALL or send a separate note.

Publication Name	Years	Price

❑ **Please bill me** **Total**

❑ **Check** enclosed payable to: **AFTSS**

Charge my ❑ Visa ❑ MC ❑ Disc ❑ Amex

Exp.

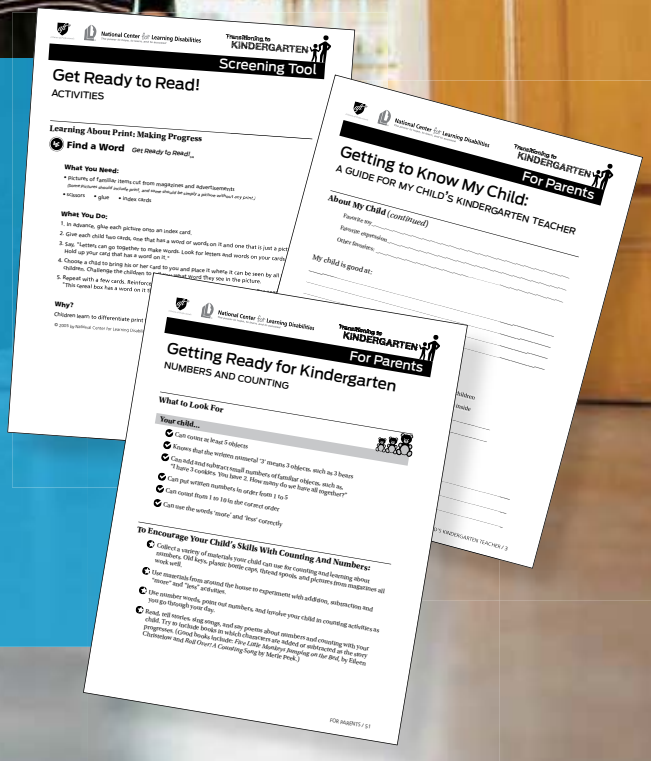
❑ **Gift:** Attach recipient's name, address and a message

S3406

American Educator VOL. 38, NO. 2 | SUMMER 2014

Transitioning to KINDERGARTEN

A Toolkit for Early Childhood Educators



Whether a child is in pre-K, Head Start, or child care, or at home with parents or caregivers, the **transition to kindergarten can be an exciting but stressful time**.

That is why the **American Federation of Teachers** and the **National Center for Learning Disabilities** have teamed up to offer the second edition of ***Transitioning to Kindergarten***. ***Transitioning to Kindergarten***, which is available at **go.aft.org/t2k**, is a free online toolkit with helpful resources in English and Spanish for:

- **Early educators**
- **Parents**
- **Preschool-age children**

National Center for Learning Disabilities
The power to hope, to learn, and to succeed

aft
A Union of Professionals