

AMERICAN Educator

A JOURNAL OF EDUCATIONAL EQUITY, RESEARCH, AND IDEAS

Core Concepts, New Twists



Together, we're
creating safe,
welcoming,
relevant, and
engaging public
schools where

Children regularly
read whole books, p. **7**

Educators fight for
vulnerable youth, p. **13**

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Protecting our Students



Before a raid, families should:

- **Identify a local nonprofit organization that can help you.** Find out who in your community provides free legal support services (e.g., immigration advocates, legal aid organizations, churches or worker centers).
- **Identify an attorney.** Find out the name and phone number of a reliable immigration attorney ahead of time and keep this information with you at all times.
- **Obtain a “know your rights” card.** These cards state that you would like to exercise your right to remain silent and that you would like to speak to an attorney. The name and phone number of your attorney should be listed on the card.
- **Advise family members who do not want to be questioned by ICE to stay away, if a raid occurs, from the place of the raid and where the detainees are held.**
- **Start saving money.** You’ll need money to hire an attorney and for toiletries and food during detention. It’s best to start saving now.
- **Create a family immigration raid emergency plan.** To find out how to make your plan, see the “Immigrant Youth Guide for Educators and Support Staff” at www.aft.org/immigration.

Questions families should address in order to prepare for an immigration raid

- Who will take care of my children (family member and/or legal guardian)?
- Who can sign a power of attorney?
- Who will have access to my assets (bank accounts, car, home, etc.)?
- How and where can I find legal help? What are the forms I need to have ready to be able to receive this legal help?
- How can I find my loved one in detention?
- What are a person’s rights in detention?
- How do I know if my loved one can pay bond?
- How can I fundraise to pay for a bond or an attorney’s legal services?
- What can I do to help my loved one?
- Who or what organizations can help me?

Know your Rights

Information for
students and
families



AFT, AFT-00
555 New Jersey Ave. N.W. | Washington, DC 20001
www.aft.org



The AFT fights for opportunity, dignity, and a better life for all—that’s why we are standing up to protect our immigrant and refugee students and families. As the Trump administration increasingly attacks these communities nationwide, we’re helping them understand their rights and where to turn for help.



For more immigration resources and toolkits, visit aft.org/our-community/immigration.

Know Your Rights Card

I am exercising my Fifth Amendment right under the U.S. Constitution to remain silent, my right to refuse to answer your questions and my right to refuse to sign anything until I consult an attorney.

Unless you have a signed judicial warrant to search the area, I do NOT consent to your search of my home, vehicle or property. If I am detained, I request to contact this attorney/organization immediately:

Name/Phone Number: _____

Thank you.

The AFT’s “Know Your Rights” resource (go.aft.org/f41) has tips to prepare for a US Immigration and Customs Enforcement (ICE) raid—including what to do if ICE comes to the door. And legal rights cards in English and Spanish give a script that families can use if ICE questions or threatens to detain them.



Affordability Really Matters

RANDI WEINGARTEN, AFT President

I HAVE BEEN around politics long enough to know that you can be on the right side of a fight and still lose—at least in the short run. That’s what happened in the latest standoff over the shutdown of the federal government, with Democrats fighting to preserve Americans’ access to healthcare and food assistance against an unrelenting Republican Party and president who showed there was no apparent limit to the pain they were willing to inflict.

The labor movement repeatedly called for the government to be reopened, federal workers to be paid, and Congress to extend Affordable Care Act subsidies to prevent skyrocketing healthcare premiums from hitting people’s pocketbooks on Jan. 1. While we disagreed with the eight Democratic senators who concluded that they had no foreseeable path to victory—given Republicans’ willingness to allow Americans to suffer indefinitely—let’s place fault where it belongs: with the party that controls all three branches of government and that decided to weaponize hunger and healthcare for political leverage. And let’s redouble our efforts to elect leaders who will deliver a better life for all of us, starting with addressing the affordability crisis.

That’s the message Americans sent politicians in state and local elections across the country on Election Day last month. They want their elected officials to lower the cost of living, treat people with dignity, and strengthen public schools, not seize power for themselves. Voters supported public education with important school board wins, passage of school funding referendums, and the election of public school supporters over voucher proponents.

Whether a progressive in New York City, a liberal in New Jersey, or a moderate in Virginia, successful candidates all had something in common: a relentless focus on what Americans need—a life they can afford, opportunity to get ahead, and a real voice in our democracy.

The differences in the style and politics of these winning candidates showed that

there is no one-size-fits-all path to victory in statewide or local elections. It takes a big tent to reach and represent our country’s diverse electorate in meaningful ways. And we’ll need that big tent, because we are in a moment like never before.

People are being terrorized, assaulted, and disappeared off the streets by masked government agents. President Donald Trump is using the Justice Department to persecute his political opponents. He is attempting to force universities, law firms, and media companies to bow to his ideological agenda. His draconian cuts to research institutions are sabotaging scientific and medical breakthroughs. He is vilifying and dehumanizing minority groups. He is using the military for domestic control and using the presidency to enrich himself. All with the acquiescence of his party. American democracy is backsliding.

But Americans made clear they want a democracy that honors the rule of law. From California, where voters overwhelmingly supported redrawing its congressional districts in response to Trump’s redistricting war, to the Pennsylvania Supreme Court justices who retained their seats, voters supported checks and balances.

And growing numbers of Americans are taking action. From strong turnout in the November elections, to historically high interest in the 2026 midterm elections with a year to go, to the millions of Americans who attended “No Kings” protests in red, blue, and purple parts of the country, Americans are taking a stand.

We must do everything we can to protect people, because the Trump administration and its allies will not. Americans deserve leaders who care about us enough to put politics aside and work toward solutions that improve lives, not shatter them.

We need to call out the lawmakers who took an eight-week paid vacation while air traffic controllers and other federal workers went without pay. Lawmakers who stopped food assistance from going to children and families in need, and who



Americans want a life they can afford, opportunity to get ahead, and a real voice in our democracy.

created a healthcare crisis that they are about to make significantly worse. They’re following the lead of a president who threw a *Great Gatsby*-themed party the same night he cut nutrition assistance for families and who claims the affordability crisis is a “con job” created by Democrats.

Trump’s and Republicans’ indifference to America’s healthcare crisis caused the longest shutdown of the federal government in US history. Democrats lost the shutdown battle, but they have not given up. They continue to fight to keep premiums from doubling for more than 20 million Americans and to protect access to high-quality, affordable healthcare for all.

Amid today’s chaos, cruelty, and economic concerns, we need to envision a future in which people see that the American dream is achievable for them. We need to fight for policies, programs, and elected officials that enable working people to support themselves and their families without constant struggle and anxiety. We can and must build a better future for all Americans. ■

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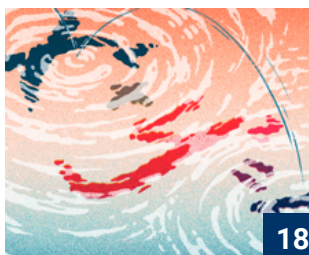
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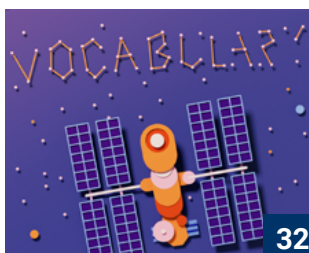
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OUR MISSION

The AFT 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.

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Elevating Critical Issues—and Trustworthy Information—Through Vital Lessons

In 2025, the AFT launched a series of town halls focused on providing timely, science-based health insights for AFT members and their communities. The series, "Vital Lessons: Health Chats with Dr. Vin Gupta," covers a wide range of topics—including measles, perimenopause and menopause, autism, immunizations and back-to-school safety, and mental health—and is available at sharemylesson.com/vital-lessons.

For this special edition of Share My Lesson, we talked with Dr. Vin Gupta about what inspired the Vital Lessons series as well as his unique career path in medicine. A pulmonologist and a leading public health expert at the intersection of healthcare, technology, and communication, Gupta is the managing director of healthcare innovation at Manatt, Phelps & Phillips, LLP, a major in the US Air Force Reserve serving in the Medical Corps, and a regular medical analyst for NBC News and MSNBC.

—EDITORS

EDITORS: Will you share your path to becoming a doctor and why this career is important to you?

DR. VIN GUPTA: I've been heavily influenced by my mom, who was a neonatal intensive care doctor. I saw the impact she had on her patients, who were tiny, critically ill babies, as she exuded love, warmth, and empathy. It showed me from a very early age that there are few things in life as meaningful as being trusted to care for somebody else's loved one.

I was also heavily shaped by September 11. My first day of college was literally September 11, 2001. I was at Princeton, about 40 minutes south of Lower Manhattan, so that day brought an emotional window into the possibilities and impact of medicine and a desire to one day join the armed forces in some capacity.

After my first two years of medical school, I was fortunate to have two seminal experiences in global health. I spent time in Uganda working to understand malaria burden. Then I spent a year working closely with the Chinese Center for Disease Control and Prevention to understand the high cancer burden in Shanghai. While learning what might be useful in the American context, my colleagues and I were also building bridges across countries that didn't always see eye to eye. This was around the time that Presi-

dent Obama came into office, and the focus on soft power and diplomacy also became top of mind for me. By the time I graduated medical school, I knew I wanted to help improve global health as a clinician and communicate that focusing on shared health challenges makes for a safer world.

In 2011, I went to Seattle to begin a residency in internal medicine, and in March 2012, I joined the Air Force Reserves to serve in the Medical Corps, then completed officer training school and was formally commissioned in 2015. My military experience has been deeply impactful. I've seen the intersection of healthcare in our military and how helping other nations build better health systems furthers our national security. There's a soft power element to global health that meets common goals, like pandemic preparedness and rooting out disease.

After my residency in internal medicine, I pursued a career in pulmonary critical care medicine and got a master's in public administration focused on healthcare policy and communication skills. That decision turned out to be fateful in a really good way, as we've now seen for the last six years that lung health is public health. At the same time, I was in the throes of military service as an ICU reservist. I was part of a critical care air transport team tasked with safely evacuating and transporting critically ill soldiers from downrange back to the United States. I rose in the ranks, ultimately becoming a major, and led that team on the West Coast and in the Pacific Northwest.

This is how I have led my life: doing things that I found meaningful; following curiosities in global health, military medicine, and bedside communication; and trying to be the best doctor I could through all these trainings. Along the way, I was often asked to speak publicly on matters related to lung health, like climate change or vaping. Then COVID hit, and I kept being asked to speak. I wasn't looking to be a TV doctor, but communicating what I hope is trusted health information to a large audience has now become an important part of my life.

EDITORS: Is that dedication to sharing information why you are giving so much of your time to Vital Lessons?

VIN: I think it's more critical now than ever to engage in conversations with a diverse audi-



COURTESY OF VIN GUPTA

I've tried to bring experts under the banners of Republicans and Democrats to discuss issues that matter to all of us.

ence to understand people's questions and try to distill down complexity in an accessible, non-judgmental, and non-condescending way. Also, it's been revealed in recent years that the ways healthcare leaders have communicated with the public on health issues are not working. For example, posting something on the Centers for Disease Control and Prevention (CDC) website and then thinking it's going to diffuse down to the masses and people will trust it—that doesn't work.

There's a tension between the public wanting institutional credibility in some cases but rejecting it in others. The institutions providing the vaccine recommendations that are ignored by a lot of people are the same institutions that credential me to provide intensive care to a family's loved one; they are the same

institutions that credential a trauma surgeon to provide emergency surgery on somebody who was in a car accident. Yet while there's a segment of society that says, "Whatever the CDC puts on the website, we're going to revolt against it," many of those same people want a credentialed, respected clinician to provide lifesaving care to them or their loved ones if they need it. Some people—even some with medical degrees behind their names—are taking advantage of this tension for their personal aggrandizement.

I want to move the needle forward, which does not happen unless you're out there meeting and talking with people. Through Vital Lessons, I see an opportunity to move the needle forward with AFT members, who are a microcosm of America. Every day, the AFT's 1.8 million members are doing vital frontline work in hospitals, schools, and other places across the country. So, partnering with the AFT to talk about issues that matter with real people who are doing the real work is a privilege.

EDITORS: How are you choosing the experts featured in the series?

VIN: I am not the nation's top expert on any topic. It is important to me that this series be a platform to bring together the best healthcare leaders and thinkers because we don't have the best, by a long shot, in the federal government right now. In fact, some of the leaders we have in healthcare at the federal level are among the worst; they are distorting it and harming public health and families.

In response, I've tried in my platforms—and now especially through Vital Lessons—to bring healthcare experts at the highest levels of leadership under the banners of both Republicans and Democrats to discuss apolitical issues that I think matter to all of us.

In March, we brought Dr. Benjamin Hoffman, the 2024 president of the American Academy of Pediatrics, to talk about measles. In April, we heard from President Trump's first surgeon general, Dr. Jerome Adams—one of the nation's foremost experts on youth mental health. For our May town hall, we talked with Dr. Bayo Curry-Winchell and Dr. Kathleen Green, two leading African American women's health experts, about perimenopause and menopause because Black women often do not receive the same level of healthcare as white women. In June, we had Dr. Mandy Cohen, President Biden's former CDC director, talking about caring for ourselves. Then in July, we talked about autism and dispelled common myths with Dr. Peter Hotez, an internationally recognized expert in vaccine development, and Danielle Hall, a senior leader from the Autism Society of America. In August, we talked with Dr. Dave Chokshi, who was New York City's commissioner of health during COVID, about back-to-school safety. September's session was with Dr. Demetre Daskalakis, who served under Republican and Democratic presidential administrations in senior roles at the CDC, to talk about vaccines and childhood health. In November, we focused on protecting mental health and building community in sessions with Dr. Irwin Redlener, a nationally recognized expert on disaster preparedness, and Casey Pick, the director of law and policy at the Trevor Project. And I'm looking forward to upcoming discussions on creating inclusive communities for individuals with disabilities, and more.

What we're trying to do with this series is bring union and healthcare leaders together to talk about public health and get people the science-based, trustworthy information they need. We haven't been perfect, but we remain dedicated to the power of coming together in collaboration in this new world, and that is the spirit of Vital Lessons. ■

Recommended Resources

The AFT's award-winning "Vital Lessons: Health Chats with Dr. Vin Gupta" series brings expert guidance to help communities make sense of complex, pressing health issues in real time. These town hall-style webinars are paired with blogs and other resources to help families, educators, and community members navigate health concerns and make informed decisions. All sessions are available live and then on demand for free.

A Town Hall on the Measles Outbreak and What You Need to Know
go.aft.org/38f

A Town Hall on Mental Health, ADHD and What You Need to Know
go.aft.org/0cy

A Town Hall on Perimenopause, Menopause and What You Need to Know
go.aft.org/y8k

A Town Hall on Wellness, Public Health and Taking Care of Ourselves
go.aft.org/a3q

A Town Hall on Autism, Education and Public Trust
go.aft.org/o3j

A Town Hall on Immunizations and a Healthy School Year
go.aft.org/qx7

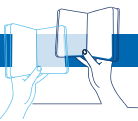
Cutting Through the Noise: Vaccines, Childhood Health and Navigating the School Year
go.aft.org/3py

Caring for Veterans, Families and Communities
go.aft.org/0p6

Supporting the LGBTQIA+ Community: A Vital Lessons Chat with the Trevor Project
go.aft.org/7d5

Youth Mental Health Spotlight:
The Changing Landscape of ADHD

Explore key insights from Dr. Vin Gupta's latest public health town hall on ADHD, where he breaks down the evolving science, rising diagnosis rates, treatment options, and the critical role of



GIVING STUDENTS THE EDUCATION THEY DESERVE

Public education is a cornerstone of our democracy, providing the core knowledge and critical-thinking abilities that give all students paths to opportunity and enable them to participate in civic life. But instead of supporting and investing in public schools, the Trump administration and right-wing extremists are trying to dismantle and destroy the entire system. Here, we highlight three resources that can help us fight for the public schools all students deserve. The first explains how book bans, which are one arm of extremists' attacks, erode educational freedom and student engagement; it also highlights how we can protect the freedom to read. The next two resources focus on one key way to deliver on the promise of public education: create more community schools.



Banning Books Should Not Be Normal

PEN America's October 2025 report, *The Normalization of Book Banning: Banned in the USA, 2024-2025*, documents the ongoing censorship crisis in US public schools. The report situates book bans within a broader campaign to restrict knowledge, undermine educators, and take ideological control of public education; the authors argue this "assault on students' freedom to read" is ultimately symptomatic of the erosion of both public education and US democracy.

For the 2024-25 school year, PEN America recorded 6,870 instances of book bans across 23 states and 87 districts—part of a trend totaling nearly 23,000 bans across 45 states since 2021. Three states far outpaced the rest of the nation in bans: Florida led with 2,304, followed by Texas with 1,781 and Tennessee with 1,622. There were 3,752 unique titles banned; among the most removed were Anthony Burgess's *A Clockwork Orange*, Patricia McCormick's *Sold, Forever...* by Judy Blume, and *Wicked* by Gregory Maguire.

The report identifies several notable trends in and takeaways from book censorship efforts in the last year. Among them are:

- **Censorship is becoming normalized.** Book bans are no longer isolated incidents but have become an entrenched feature of school governance, largely driven by state legislation, pressure exerted on school districts from national and local groups, and threats to educators' professional licensing.
- **Bans are increasingly enacted out of fear of legislation.** Fear of violating new laws—not actual legal mandates—drove most bans. Of 2,520 books removed from shelves due to pressure from or the threat of state legislation, only 3 percent were required by law; the rest resulted from districts erring on the side of censorship from fear they might be found out of compliance.
- **A persistent focus of bans is the erasure of diverse identities and representation.** Fear-based rhetoric about "parental rights" and "protecting children" has been employed to remove books reflecting diverse identities and cultures and works that feature LGBTQIA+ themes and characters—which are increasingly conflated with "sexually explicit material."
- **Book bans harm schools and students' learning.** Schools are witnessing a chilling effect as their libraries empty and educators self-censor. Impacts to learning include decreased student engagement in reading, restriction of students' voluntary inquiry and critical thinking, and interference in educators' ability to deliver quality instruction.
- **Communities are fighting back.** This is the first year that PEN America has also tracked public resistance to book censorship. In 70 of the 87 districts with bans, parents, students, educators, authors, and community members fought to protect the freedom to read and return books to shelves.

The report closes with a warning that censorship has rapidly spread beyond school libraries, as other educational materials—including textbooks, curricula, and scholarships—are increasingly targeted for banning. The fight to keep this "slippery slope" of censorship from bankrupting students' education, it concludes, will take all of us.

To read the report, visit go.aft.org/m4r.

Community Schools and the Rebuilding of Public Education

In stark contrast to the shrinking educational opportunity caused by censorship, community schools strengthen public education, improve students' learning outcomes, and support student, family, and community well-being. New evidence for this well-established finding comes from the Learning Policy Institute's report, *Community Schools Impact on Student Outcomes*, which examines early impacts of the \$4.1 billion California Community Schools Partnership Program (CCSPP) grants—the largest investment in a state-level community schools initiative in the nation. Since 2021, California has funded 2,493 school sites to transform them into community hubs integrating health services, expanded and rich learning opportunities, family engagement, and collaborative leadership.

On average, 90 percent of students in CCSPP grantee schools are from families with low income, are English learners, or are in foster care. As in the rest of the nation, these students in particular have struggled in the aftermath of the COVID-19 pandemic with its associated challenges—including chronic absence, deteriorating mental health, and increased behavioral incidents. Community schools seek to redress these challenges through a whole-child, asset-based, community-engaged approach that cultivates student success where traditional school structures have not been sufficient.

To evaluate the first cohort of 458 implementation schools, the study compared data from grant recipient schools with data from similar non-grantee schools from the 2018–19 to 2023–24 school years. In keeping with previous research on community schools, including evidence from large-scale studies in Maryland and New York, findings from the first full year of CCSPP implementation show consistent positive impacts on student attendance, exclusionary discipline, and academic achievement:

- **Chronic absence fell sharply.** On average, CCSPP schools—many of which saw chronic absence rates spike to over 40 percent in 2021–22—had absence reductions 30 percent greater than those in comparison schools. This reduction is roughly equivalent to 5,500 students attending school more regularly. Gains were strongest in elementary schools, suggesting strong attendance-focused interventions at that level.
- **Suspensions dropped 15 percent.** While comparison schools saw slightly increased suspension rates over the study period, CCSPP schools experienced a significant reduction in suspensions. The largest improvements were seen in secondary schools and in suspensions among Black students, where suspension rates were highest.
- **Academic achievement rose.** Students in CCSPP schools gained roughly 43 additional days of learning in math and

roughly 36 additional days of learning in English language arts, while comparison schools declined. Black students showed the largest gains (equivalent to 130 additional days of learning in math and 151 in ELA), followed by English learners (58 and 72 additional days of learning in math and English, respectively) and socioeconomically disadvantaged students (58 and 43 additional days of learning in math and English, respectively). Improvement in chronic absence was strongly linked to test score improvements, and schools that had greater chronic absence reductions saw higher gains in academic achievement.

The researchers theorized that specific features of the community schools model helped close the attendance gap and facilitate learning. Improved access to health services potentially reduced illness-related absences and enhanced students' physical readiness to learn. Increased mental health supports potentially reduced stress-related chronic absence and improved cognitive functioning and focus during instructional time. The improved family engagement associated with the community schools model likely strengthened parents'

commitment to their students' regular attendance and their ability to support learning at home. Finally, the improved sense of belonging and student engagement seen in community school implementation may have motivated students to come to school more often and participate more actively, improving the quality of instructional time and enhancing their learning experience.

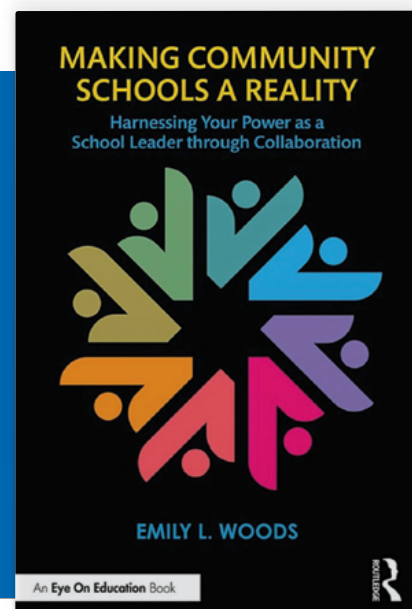
These results are further evidence that community schools effectively address educational inequities and provide quantifiable academic and behavioral benefits for the most vulnerable students. To read the entire report, visit go.aft.org/tmk. To learn more about the community schools model, including case studies from AFT locals and helpful resources to implement the model in your district, visit aft.org/position/community-schools.



Help Build Thriving Community Schools

Emily L. Woods's new book, *Making Community Schools a Reality*, is more akin to a toolkit than a book; it offers a step-by-step approach for developing essential practices—like authentically engaging families—and growing into a community school. Written for school leaders (including but not limited to administrators), it includes detailed examples from community schools in rural and urban settings, a summary of relevant research, and practical tips on everything from establishing a high-level coordinator role and conducting an assessment of assets and needs to securing sustainable funding. Woods interviewed more than 40 principals about their successes and challenges as community school leaders, and their voices are featured throughout. But as Woods is careful to point out, this book has crucial lessons learned for everyone who is dedicated to turning their school into a community hub that offers community-driven health, education, and social services delivered by trusted community partners.

For a preview of the book that includes the full introduction, visit go.aft.org/k1w. And for an excerpt of Woods's first book, *The Path to Successful Community School Policy Adoption*, see "Collaborative Community Schools" in the Fall 2023 issue of *American Educator*: go.aft.org/66m.



Beyond Excerpts

Teaching with Whole Books Boosts Comprehension and Engagement



By Natalie Wexler

“The death of the novel arrived in my 9th grade English class some years ago,” a former English teacher who blogs under the name Cafeteria Duty has written.¹ That day, the class was about to discuss the dramatic courtroom scenes in *To Kill a Mockingbird*, when it is at last revealed what happened between Tom Robinson, a Black man in the South in the 1930s, and the white woman he is accused of raping.

Before launching into that discussion, the teacher decided to first ask students to review the major plot points and characters. This, according to the teacher, is the “astonishing” debate that ensued:

Tom Robinson was the sheriff, one student asserted.

No, that’s Lennie, corrected another.

Lennie’s from a book we read last semester, stupid, someone politely corrected. *Tom Robinson is the character who never leaves his house*.

Natalie Wexler is an education writer and the author of *Beyond the Science of Reading: Connecting Literacy Instruction to the Science of Learning and The Knowledge Gap: The Hidden Cause of America’s Broken Education System—and How to Fix It*. She is also the coauthor, with Judith C. Hochman, of the first and second editions of *The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades*.

The class erupted. *That’s Boo!* Above the din, someone shouted, *Tom is Scout’s classmate, the boy with no lunch!* On it went.²

In shock and “not a little despair,” Cafeteria Duty berated the class for not having kept up with the reading, briskly summarized the plot of the book, and “never taught that novel again.” Realizing that students couldn’t be counted on to do any reading for homework, the teacher turned to increasingly shorter novels before ultimately abandoning teaching whole books altogether.

Cafeteria Duty is not alone. The novels that used to be staples of English classes—*The Great Gatsby*, 1984, *The Scarlet Letter*—seem to have faded from the curriculum, often replaced by brief texts and excerpts. Hard data are difficult to come by, but Cafeteria Duty, now an administrator, calls it an “obvious given” that “students are reading fewer books for school, and English teachers are assigning fewer books, most certainly at the high school level.”³

Many other observers concur.⁴ Three former teachers who now write guides and offer professional development on reading instruction say they’ve seen a dearth of whole books during their visits to hundreds of middle and high schools in recent years.⁵ Psychologist and author Jean Twenge has written that at her daughter’s high school, “regular English classes no longer assign books, only short stories and articles.”⁶ I’ve spoken with two brothers—one a

recent college graduate and the other a freshman in college—who attended a highly selective public high school in Washington, DC. Aside from a couple of creation myths in ninth grade—and, for one of them, the short novel *Things Fall Apart*—they hadn’t been required to read an entire book during their high school careers.

The limited data available for earlier grades indicate that many children also aren’t reading whole books before they get to high school. A 2023 survey of English language arts teachers in grades three through eight found that only 17 percent relied primarily on whole texts, defined to include “complete poems, novels, plays, and articles.” Almost half said they use some whole texts combined with shorter pieces. Significantly, about a quarter primarily used basal readers, which generally don’t incorporate whole books, and/or text selections and excerpts.⁷

Brief Passages Are Failing Our Students

Lack of student interest is one of many justifications for the shift away from whole books. Another is lack of time in a world where, as Cafeteria Duty observed, many students simply don’t read outside class.⁸ That’s been especially true since the pandemic, when many schools lowered expectations because students were dealing with difficult or even traumatic situations. Even though the pandemic is long over, those looser standards are often still in place.

Teachers also cite shrinking attention spans. In the 2023 survey, 83 percent of teachers said their students’ reading stamina had decreased since 2019, including 53 percent who said it had decreased “a lot.”⁹ Experts say that screens, phones, and social media have accustomed students to skimming and reading only brief snippets. Students have also gotten used to the constant stimulation provided by digital media, making it harder for them to persevere through lengthier texts.¹⁰

In addition, I’ve heard English teachers say they’re under pressure to cover a range of genres—not just novels but short stories, poetry, plays, and nonfiction—as well as teaching skills like research and writing. The Common Core State Standards have been widely interpreted to require English teachers to include more nonfiction, even though the percentages of nonfiction in the standards were intended to apply across the curriculum.¹¹ In addition, the Common Core’s emphasis on “close reading” may have led to increased reliance on short texts, since it’s hard to conduct a close read of an entire novel.

Even before the Common Core became influential, the federal No Child Left Behind legislation contributed to the trend away from whole books by attaching high stakes to standardized reading tests. Those tests present students with brief passages or excerpts followed by comprehension questions. In an effort to equip students for success on the tests, many schools have adopted that approach for reading instruction as well, despite the lack of evidence that it increases test scores—or comprehension.¹²

Consider a lesson, available online at go.aft.org/mgy,¹³ designed to teach third-graders the skill of identifying literal and

nonliteral language in a story.¹⁴ The vehicle for teaching the skill is a story about Amelia Bedelia, the famously literal-minded fictional housekeeper. In the story, Amelia Bedelia’s employer asks her to get the spots out of a dress in the closet. Of course, she finds a polka-dotted dress—and proceeds to get the “spots” out by cutting them out with a pair of scissors.

In the lesson, students get only one paragraph from the book, followed by comprehension questions of the sort they would see on a standardized test—like “What is a different way that Mrs. Rogers could have asked Amelia Bedelia to do what she wanted?” Providing children with the entire book would not only be more engaging, it would also likely make it easier for them to grasp a complex concept like nonliteral language.

While standards and tests have contributed to this approach to reading comprehension, the fundamental impetus is a long-standing but mistaken assumption that pervades the education system. Reading comprehension has been seen as essentially a set of skills and strategies, like “making inferences” and “finding the main idea,” that can be taught and measured in the abstract.¹⁵ As a result of their training and materials,¹⁶ many literacy teachers see their job as teaching these comprehension skills rather than any particular content—or any particular books.

If comprehension skills are in the foreground, teachers who are under pressure to cover a lot of material are likely to opt for shorter texts as a means of teaching the skills. Education journalist Holly Korbey asked her son’s middle school teacher why the class was only reading excerpts or just the first half of a chapter book. His reply was that “it doesn’t matter whether it’s the entire book or an excerpt” because “the skills are the same.”¹⁷

It’s certainly important for students to be able to find the main idea or make inferences, but evidence from cognitive science indicates that these aren’t skills that can be taught in the abstract and applied generally. Unlike riding a bike, reading comprehension skills don’t “transfer.” If you know how to ride a bike,

it doesn’t matter *which* bike you’re riding. But reading doesn’t work that way—which topic you’re reading about matters. It’s easy to make an inference about a text on a topic you know a lot about and difficult or impossible to do so with a text on a topic that’s unfamiliar.¹⁸

Prior knowledge about a topic isn’t the only component in the complex process of comprehension, but it’s a key factor and one that has been largely overlooked. And the more general academic or cultural knowledge and vocabulary people possess, the greater their chances of understanding anything they try to read.¹⁹ The most effective way to build that general knowledge and enable general reading comprehension is through a curriculum that builds knowledge of lots of topics systematically, beginning in the early grades.²⁰

Not only does skills-focused instruction fail to boost reading comprehension, it also turns reading into a joyless chore. When a nationally representative sample of 13-year-olds was asked in

A 2023 survey of English language arts teachers in grades 3–8 found that only 17 percent relied primarily on whole texts.

2023 if they read for pleasure every day or almost every day, only 14 percent said yes. That's a marked decline from 2012, when 27 percent were in that category, and from 1994's 32 percent. The flip side is that in 2023, 31 percent said they never or hardly ever read for fun—a significant increase from 2012, when the percentage was 22, and 1994, when it was just 12.²¹

Of course, societal factors like social media have contributed to this trend, but it's a reasonable assumption that the way reading comprehension is taught in schools has led many adolescents to see it as something that has nothing to do with fun. And those societal factors only make it more urgent than ever for schools to show kids that reading books can be both a way of learning about the world and a source of pleasure. One way to do that is to introduce students, in school, to whole novels.

Whole Books Boost Comprehension

Reading whole novels can boost both students' interest in reading *and* their reading comprehension scores. One study,²² which took place in England, had students read two challenging novels, one classic and one contemporary, over the course of 12 weeks, with most of the reading done aloud by teachers (though students also read aloud, usually in small groups to make them more comfortable). The students, who were in the equivalent of seventh grade, attended 10 urban and rural schools and ranged from being 50 or more months behind in reading to performing above average.

According to the authors of the study, in England (as in the United States) struggling readers "are often regarded by teachers as unable to read whole narratives and given short, simplified texts, yet are expected to analyze every part in a slow laborious read-through." The 20 teachers participating in the study were, in contrast, advised to move through the novels at a fairly brisk pace, pausing only when needed (e.g., when students looked confused or at the end of a section) to make sure everyone was following the story.

At the beginning and end of the 12-week period, students were given standardized reading comprehension tests. On average, students made almost nine months of progress; weak readers made 16 months of progress. And even though the researchers weren't trying to spark a love of reading, the experiment appeared to have that effect. Students who had previously been reluctant readers couldn't wait for the next chapter, frequently coming to class excited to read. This study has given rise to a project based at the University of Sussex in England, called the Faster Read, that offers free guidance for teachers (see go.aft.org/so3 for details).

Why would novels boost reading comprehension so dramatically? The researchers weren't sure, but I have a theory. We're



Reading whole novels can boost students' interest in reading *and* their reading comprehension scores.

more likely to remember things when we're affected emotionally, and novels can engage us emotionally far more than brief texts or excerpts can. In addition, as cognitive psychologist Daniel Willingham noted, the human mind "seems exquisitely tuned to understand and remember stories" as opposed to expository texts.²³ Those factors may have helped students absorb and retain the language structures and vocabulary they heard in the novels, equipping them to better understand the unrelated passages on the standardized tests.

Still, it can be difficult to teach using novels and whole books in the current environment. Is it really worth the effort? For a number of reasons, the answer is "yes."

Students' Abilities Are Suffering

The trend toward brief passages and skills-focused instruction in the K–12 curriculum has consequences for what students are able to do once they graduate from high school. Anecdotal and some experimental evidence indicates that many college students, including some at highly selective institutions,

struggle to make sense of 19th-century novels.²⁴ Some professors say that even contemporary works of literature are incomprehensible to their students.²⁵

I've spoken to a number of professors in various disciplines who say they've had to significantly lower their expectations, reducing the length of reading assignments and still devoting class time to summarizing them. There have always been students who don't do the reading, but they say this is a sea change.

Stuart Carroll, an experienced professor of elementary education at the College of New Jersey, told me his department used to have all students read the same book over spring and winter breaks, with positive results. But it became harder to get students to do the reading, and the program was discontinued in 2017. Carroll has seen a similar phenomenon in the freshman seminar he teaches. It covers five "interesting and readable books," and he says in the past, students "came out of the class with a more positive attitude toward reading." Now, he says, only a few students bother to read the books.

"I was kind of shocked this year at what my students thought was an onerous amount of reading," said an assistant professor of European history at a flagship state university who requested anonymity. He eventually realized he couldn't assign more than 20 pages per class, "which extremely curtailed what I could do." Even then, he could tell that many students still weren't reading what he'd assigned.

Even when students do the reading, professors say, many are unable to understand or analyze it. "We are in new territory when even highly motivated honors students struggle to grasp the

basic argument of a 20-page article,” Adam Kotsko, who teaches at North Central College in Illinois, wrote recently.²⁶

These anecdotal observations are backed up by data: ACT scores have been declining over the past decade or so, including in the area of reading comprehension. In 2024, 57 percent of students scored “Below Proficient in Understanding Complex Texts,” a marked increase from 2016, when only 23 percent fell into that category.²⁷ Likewise, scores on the most recent national test of 12th-graders’ reading comprehension ability dipped to a historic low, with the average score in 2024 ten points lower than when the test was first given in 1992.²⁸

The combination of brief passages and skills-focused comprehension instruction in K–12 may also lead to a “check the box” approach to reading. Many students no longer see the value of diving into a complex text and extracting whatever meaning and nuance might be there. They often want professors to tell them what to look for—or just provide the key points. “Gone are the days when you could expect students to do the prep work,” said Jackie Witkowski, an assistant professor of art history at Western Washington University.

If a professor doesn’t provide a summary, students are increasingly likely to turn to generative AI (artificial intelligence) tools like ChatGPT to provide one. Various surveys have found that anywhere from a third to almost all undergraduates use AI, with more recent studies showing higher proportions.²⁹

But reading a summary of a novel is a far different experience from reading the novel itself. I ran the opening paragraphs of *Bleak House* by Charles Dickens through ChatGPT. Although the summary I got back was accurate, it lacked the charm and humor that made Dickens so popular in his own time and makes his prose worth reading today. Of course, the summary was easier to understand. But, crucially, that very lack of effort deprives the reader of important benefits.

As literacy researcher Maryanne Wolf has suggested, learning to parse denser prose may develop both cognitive abilities and the “cognitive patience” that enable deep reading.³⁰ In addition, evidence shows that in middle and high school, having students summarize a text can provide a powerful boost to their understanding.³¹

Recent studies suggest that when students subcontract that task (or others that require cognitive effort) to a bot, their ability to think critically and analytically decreases.³² Similarly, if teachers in middle and high school provide summaries of novels rather than requiring students to read whole books, as some are apparently doing,³³ students may be ill-equipped to engage in summarizing themselves and unaware that they’re missing out on its potential cognitive benefits.

Reliance on summaries and shortcuts, whether provided by humans or AI tools, can lead to what some researchers have called “metacognitive laziness.”³⁴ Rather than using the shortcut as a

way to supplement learning, students begin to depend on it as a crutch. That kind of dependence can make it difficult for students not only to read but to absorb and retain information.

Even at St. John’s College in Annapolis, Maryland, a “great books” school that draws a self-selected group of students who want to immerse themselves in challenging texts, there’s been a change. Brendan Boyle, the associate dean for graduate programs, says that the “bookish” students the school draws aren’t arriving with the same ability to sit with a text and mine it for meaning. “Our graduates are no worse” than they used to be, he told me. “It’s just that the amount of labor involved in getting them to that point is greater.”

To be sure, K–12 schooling isn’t solely responsible for the changes that college instructors are seeing. But the K–12 system is likely to be our best hope for addressing them. By immersing students in whole books and treating reading as an end in itself, rather than a means of developing discrete skills, teachers at all grade levels can foster the kind of reading stamina, sustained focus, and intellectual curiosity that all students deserve to enjoy.

Whole Books Are Rewarding

It’s important to show students that reading can be fun, and reading novels—especially contemporary novels that are relatively easy to access—is a great way to do that. Reading for pleasure is associated with a host of positive outcomes, including cognitive development, academic achievement, and social and emotional well-being.³⁵

One study found that children and adolescents who read frequently for fun, especially those who read whole books, tend to experience more of a boost to reading comprehension than those who read less or engage in other kinds of reading.³⁶ Another found benefits even from “light” books like science fiction or thrillers.³⁷ Yet another found that, in adults, reading whole books is associated with greater longevity—greater even than reading newspapers and magazines.³⁸ So it’s worth doing whatever we

can to ensure that more students read for their own enjoyment.

It’s also important that all students in a classroom have the opportunity to read and discuss the *same* book, as educator and instructional coach Doug Lemov and his coauthors explain in *The Teach Like a Champion Guide to the Science of Reading*.³⁹ Choice in reading material has its place, but making it the center of a literacy curriculum leads to a fragmented class experience. And, left to their own devices, students are likely to choose books that relate to topics that already interest them rather than having their horizons expanded by a teacher or curriculum designer who is aware of more options. Providing children with the experience of reading a book together, especially a novel, can transport the entire class into another world.

At an elementary school in Amarillo, Texas, where 39 languages are spoken and almost all students qualify for free or reduced-price lunch, the practice of reading whole novels aloud

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together has had enormous benefits, according to faculty members. Describing teacher Lori Hughes's experience, Lemov said, "Each class feels like a community, and her students look forward to what book is coming next."⁴⁰ The school's principal, Genie Baca, notes that fluency scores for the classes that read whole novels together have improved dramatically, as have behavioral issues. I've heard similar observations when visiting elementary schools using curricula that center on shared novel reading.

Another argument for having students read novels—especially literary ones—is that it helps develop empathy. That certainly resonates with the experience of many readers, and studies suggest that reading fiction can enable readers to understand what others are feeling and can reduce prejudice against stigmatized groups, especially when readers are "emotionally transported" into the story.⁴¹ Some studies have found that when people read fiction, regions of their brains become activated in ways that reflect the characters' feelings and actions.⁴² It's not yet clear, though, if those effects carry over to actual behavior.

Still, as Maryanne Wolf has written, the act of reading can change our consciousness, so that "we learn to feel what it means to be despairing and hopeless or ecstatic and consumed with unspoken feelings."⁴³ And it's likely that the longer and deeper the story, the greater the benefits. Following a set of characters over a period of time can emotionally transport readers in a way that short fiction and excerpts can't.

Kyair Butts, a middle school English teacher, saw that happen when he taught sixth-graders the novel *Out of the Dust*. Butts was dubious that his students—Black kids in inner-city Baltimore—would be interested in a story about "a 13-year-old white girl from Depression-era Oklahoma." But, he told me when I interviewed him for a podcast, "when students care about a character, and when they realize that Billie Jo lost her mom and her baby brother, they are hooked. They want to keep reading."⁴⁴

For all these reasons, it's important to introduce students to, and regularly immerse them in, the enjoyable, emotionally transporting experience of reading a novel. But to fully equip students to be proficient readers, whether they go to college or not, teachers also need to guide them in making sense of challenging text, including nonfiction. Given the rampant distractions and unreliable information we all confront these days, students need to develop the capacity for sustained attention and complex thinking that immersion in complex, lengthier text can foster. That isn't always fun. Like all learning, it requires effort. At the same time, it can be immensely rewarding.



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Overcoming Barriers to Whole Book Instruction

But what about the obstacles that Cafeteria Duty and other teachers say are standing in the way of teaching whole books? Those barriers can be overcome—but probably not by individual teachers alone. Schools and districts need to provide support, ideally beginning in the early elementary grades.

While the dominant elementary literacy curricula rely almost entirely on short texts and excerpts,⁴⁵ more recently developed knowledge-building curricula that incorporate whole books seem to be gaining traction across the country. One such curriculum, Bookworms K–5 Reading and Writing, has students read a total of 265 books across the elementary grades.⁴⁶ Although not as well-known as some other knowledge-building curricula, the evidence for its ability to increase general reading comprehension, especially for lower-performing students, is compelling.⁴⁷ And judging from my own observations of the curriculum in action and conversations with educators who have used it, it also boosts students' interest in reading.

Given the importance of exposing children to whole books, that should be one of the criteria states and districts

use when approving or selecting curriculum. Shorter texts can of course have value as well, but a steady diet of them fails to supply children with the literacy nutrition they need. Some short texts, including nonfiction, can be taught in connection with a book, especially one set in a different time or place. If students are reading a novel that takes place during World War II, for example, a nonfiction article on rationing can enhance their understanding of the text while also exposing them to a different genre. Writing instruction can also be embedded in the content of a novel.

It may be more difficult to include whole books in the curriculum at higher grade levels, but it's not impossible—and it's crucial that students continue to read books at increasing levels of complexity. Doug Lemov and his colleagues have created an ELA curriculum for grades 5–8, *Reading Reconsidered*, that is built around novels, along with shorter texts that enhance students' understanding of them.⁴⁸ It includes routines designed to help students retain vocabulary and information, develop fluency, and build writing skills. Lemov and his team are also piloting a high school curriculum built around novels.

The middle grades curriculum is now used in about 500 schools, and "teachers are surprised by how much they enjoy teaching and the kids enjoy reading," Lemov told me. "You have to develop the habit of attentional skills. You have to cause reading to happen and create the conditions for stamina."

Reading Reconsidered combines teacher read-alouds, communal reading, and individual silent reading. The teacher can

“read kids into” a chapter, Lemov says, modeling fluent reading and piquing their interest. “The idea is that in class, teachers will empower students to read outside class.”

Realistically, students do need to read outside class for the curriculum to include whole books at higher grade levels. Teachers can hold students accountable for assigned reading through mandatory note-taking and quizzes. In addition to ensuring that students are doing the reading, such activities help students understand and remember key points in the story, avoiding the kind of class dialogue that led *Cafeteria Duty* to abandon whole books. But if students are in the habit of not doing homework, it may require a shift in culture engineered by a whole school, or even a whole district, to reverse that.

Especially in schools where many older students face reading challenges, however, it may still be necessary to devote a good deal of class time to reading whole books. Former English teacher Meredith Coffey has suggested that high school administrators protect or even add time for in-class reading, perhaps through double periods for ELA.⁴⁹ They can also set expectations that, for example, students will read a complete novel or play during every unit.

One significant barrier to such a change in culture is the widespread assumption that brief texts are necessary to teach comprehension skills. Lemov says that teachers who use *Reading Reconsidered* often worry it won’t pre-

pare their students for state tests. To allay their concerns, the curriculum includes guides showing that a lesson relating to a novel *is* teaching students how to, for example, make an inference about a character even if that’s not the lesson’s main objective. As Coffey points out, not only *can* students practice comprehension skills using whole novels, understanding a literary device or gleaning the author’s message may be easier with a longer text.

To enable all students to read at length and understand texts at a deep level, we need to change widely held assumptions about what reading comprehension is and how it can be fostered.⁵⁰ We have to recognize that limit-

ing students to brief texts seen as vehicles for teaching comprehension skills is an illusory and self-defeating approach. Technology and other societal pressures present new and daunting challenges to students’ abilities and attention spans, but our best chance of addressing those challenges is to center whole books in the K-12 curriculum.

Schools still have the potential to turn the United States into a “nation of readers,” to borrow the title of a landmark 1985 report.⁵¹ In the face of the temptations of screens, social media, and generative AI, that goal has only become more urgent than ever. ■

For the endnotes, see aft.org/ae/winter2025-2026/wexler.

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Helping Students Navigate Screen Reading

One potential barrier to comprehending complex text is the shift toward digital rather than printed materials in classrooms.¹ In 2021, 90 percent of district leaders reported that all of their middle and high school students had their own devices for digital learning.² Perhaps not coincidentally, some professors say college students rarely come to class with hard-copy books, even in classes that rely heavily on textual analysis.³

But evidence indicates that when people read on screens, they understand and retain less than if they read printed text.⁴ Maryanne Wolf has said that the data we have suggest that “print advantages slower, deeper processes in the reading brain” and that too much screen reading diminishes the brain’s ability to use those processes.⁵ While Wolf hasn’t focused on the effects of reading different kinds of print text, the thrust of her argument is that whole print books are essential to counteracting the effects of digital media and developing the capacity for deep reading.

Still, reading from screens is inescapable in the modern world. Wolf advocates for a “biliteracy” approach that would teach children how best to use and negotiate each medium.⁶ Similarly, linguist Naomi Baron suggests explicitly teaching students how to read printed text in a slower, more focused way and then helping them transfer those skills to reading from a screen.⁷

One way to do that is to provide students with a template for taking notes. Having students turn in their notes—ideally in their own handwriting, to prevent them from using AI—can also help teachers spot comprehension problems. Teachers can tailor questions for notetaking to particular content or use generic questions, as David and Meredith Liben, experienced educators and consultants, suggest in their book *Know Better, Do Better: Comprehension*.⁸ Their approach, the Structured Journal, has students track their thoughts as they read, using four questions, including “What don’t I

understand completely?” and “What are the most important ideas in this section?”⁹

Another possibility is to have students complete thoughtfully designed writing activities relating to their assigned reading—perhaps a sentence stem relating to a key point, which they need to complete using a word like *because*, *but*, or *although*. They might also write a summary of what they’ve read, with guiding question words like *who*, *what*, *where*, *why*, *when*, and *how*.

Many if not most students will need explicit instruction in these kinds of activities before being expected to engage in them independently, but the effort is worthwhile. In addition to boosting comprehension and retention, writing activities such as this can familiarize students with the complex sentence structures of written language, equipping them to understand more complex texts. In addition, students’ writing is likely to become clearer and more coherent.¹⁰

—N. W.



Protecting Our Students

How Two Chicago Teachers Are Meeting the Moment

The AFT is dedicated to fighting for a better life for all. Our members are standing up for their students, and they are drawing on and contributing to the supports their local unions offer. One crucial tool the AFT has long championed is bargaining for the common good. That's just what it sounds like: In addition to seeking the higher wages and better benefits educators deserve, AFT members and their locals demand the resources students need. As we face the Trump administration's attacks on students and public schools,¹ bargaining for the common good is becoming even more critical.

The Chicago Teachers Union (CTU) provides a strong example of how contract negotiations can meet this moment. The CTU's current contract—ratified in April 2025—contains several provisions that the union began working on during President Trump's first term. A CTU summary of those provisions explains that students will attend “LGBTQIA+ Safe Schools that respect their gender identity and their journeys of self-discovery, and schools that will continue to teach Black, Indigenous and other histories—so students can see themselves in their education.”²

To learn more about how CTU educators are bringing these provisions to life and protecting Chicago's students, we spoke with two teachers. Corey Blake is a music teacher at Foreman College and Career Academy, and Amaziah Burton is a special education teacher at Avalon Park Fine and Performing Arts School.

—EDITORS

PHOTOS COURTESY OF COREY BLAKE AND AMAZIAH BURTON



EDITORS: What drew you to teaching?

AMAZIAH BURTON: This is my fifth year teaching, but I am a career changer. Previously, I was in middle management for a grocery store chain and for a hardware chain. Both had a lot of staff turnover, which is typical in those industries. As I conducted exit interviews, young adults describing their dream jobs resonated with me. During the pandemic, I earned my second master's degree—this time in education—so I could become a teacher.

Some of our students, especially our Black and Hispanic students, don't have enough people around them showing them possibilities for how they can live their lives and become productive citizens. Having managed young adults in retail who were struggling to make the transition from high school into the workforce, I wanted to intervene in young people's lives earlier—to help them accomplish their goals and be successful in whatever they desire to do.

COREY BLAKE: I moved to Chicago in 2018 after finishing my PhD in ethnomusicology, which is essentially anthropology with a focus on music. I applied to become a music teacher because I wanted to have a positive impact in this world. I was not out as trans yet, but I still wanted to be the supportive teacher that trans kids need.

I transitioned during the first couple of years of my employment within Chicago Public Schools (CPS). People were very supportive. It was heartening to see that the situation for our youth today, at least in some parts of the country, is significantly different than it was when I was in school in the late 1990s and early 2000s. Our kids know themselves better than I even imagined I could know myself at that age. Many know their identities and their needs. And those who are still figuring these things out are willing to engage and talk openly.

It was really important for me when I started teaching that I became a Gender and Sexuality Alliance (GSA) advisor. (In the past, GSA referred to the Gay-Straight Alliance, but the name was updated to encompass the various identities that our young people may hold.)

"I'm ... fighting to maintain my academic freedom so I can ensure my students learn honest history and understand their true heritage, place, and potential."

—Amaziah Burton

I remember reaching out to someone at the district, saying, "Hey, I need support. I'm trying to do a GSA at my school." Shortly thereafter, I was invited to lead LGBTQ+ affirming work at the district level.

As I was working on starting my school's GSA, Lindsey Wiliston, my school's union representative, filled me in on the union's LGBTQIA+ committee. It had been essentially inactive for years, so we decided to revitalize it. Lindsey and I became the co-chairs, with the goal of building community and a safety net for our students. It's great that our kids know who they are, but that doesn't mean they're safe. And it doesn't mean that outside of school they're able to talk about who they are with the people who love them.

For both the CTU's LGBTQIA+ committee and the CPS central office's safe and supportive environments work, we ask: How can we make sure that we are continuing to find ways to support the whole student?

EDITORS: How are you, along with the CTU, working to keep students safe given the Trump administration's attacks?

COREY: As we were developing out our contract proposals in 2024, a big focus was ensuring that our queer staff and students are protected, even with the Trump administration being determined to use trans people as a pawn to enact systemic horrors. During Trump's first term, it became very clear that regardless of who is

in office, protections have to be enshrined in our contract to show that we are willing to stand up for the LGBTQIA+ community.

A lot of our contract provisions are rooted in solidifying some of what has already been happening within CPS. The district already has protections laid out for trans and gender-nonconforming students and expectations for supporting LGBTQIA+ youth. Our new contract strongly conveys that the district is required to continue that support even if the federal government is telling them not to.

Additionally, we created specific roles that are directly responsible for ensuring these protections. One of those is a gender support coordinator for every school. These coordinators are responsible for helping ensure that each school is safeguarding students, and they are guaranteed release time for training. They are also point people for actively supporting GSAs. In fact, we are pushing for this role to be taken on by GSA advisors; although this is a voluntary role, becoming a coordinator gives them leverage to expand that work schoolwide and to connect with other people throughout the district.

We also now have a position in each of our geographical networks that is responsible for helping to support, sustain, and grow GSAs within all Chicago public schools. We know that in moments of crisis, when systemic violence is being enacted toward members of our community, we have always survived through our communities—the people who love and support us. Schools that do not have a GSA also do not have the community our students need. So, having somebody at the district level who's actively working to ensure that all our schools are creating these community spaces for our students is so important. Affirming a student's name, pronouns, and identity in the classroom reduces the risk of suicide attempts by about 50 percent.³ These simple affirmations save lives. They are also life-giving. We are giving our students a chance to be in schools, curricula, and communities where they can see themselves.

AMAZIAH: I wholeheartedly agree that every school needs a GSA and a gender support coordinator. At Wendell Phillips High School, where I taught for four years before transferring to Avalon, one of my Black students was struggling with their gender identity. They asked me to call them by their affirmed name, which I gladly did, but then I had to determine their home situation. It's challenging for a student to present one way at home and another way at school. And as an educator, my job is to give them a safe space, and sometimes that includes trying to help family members adjust while still respecting parents' or guardians' wishes. A gender support coordinator could have helped the family see that their child is not lesser just because they've decided that this is how they want to live life. They deserve to be loved in the way they want to be loved.

Phillips also has a significant number of students struggling with their sexual orientation. Still, the school only has social workers once or twice a week working within the building to provide services to students. As a special educator, I was often the person students confided in. I think that's to be expected because special educators deliver individualized instruction. We not only modify lessons, but we also help students modify their behavior and find

accommodations. Through all of this, we get to know our students deeply. I'm thrilled that the CTU's new contract mandates social workers in all schools on all instructional days.⁴ Students and teachers need that level of support.

As a Black educator, I'm very concerned about the Trump administration's attacks on the programming we offer our students. The administration has deemed much of what we do to support students' success to be DEI (diversity, equity, and inclusion), and, shockingly, it is against that.

This leaves me in a very strange space. Due to how CPS allocates special education teacher staffing across schools annually, I was already fighting to maintain my place in the world of education. Now I'm also fighting to maintain my academic freedom so I can ensure my students learn honest history and understand their true heritage, place, and potential. Frankly, it's hard to be on the right side of the truth these days. It's scary too. I fear that some CPS students will be indoctrinated into Trump's rhetoric and world-

"We are giving our students a chance to be in schools, curricula, and communities where they can see themselves."

—Corey Blake

view. The more public schools are starved of funds, the worse the education students receive and the more likely they are to fall for Trump's foolishness. Thankfully, our contract states that educators may supplement curricula, including with culturally responsive and antiracist materials.⁵

Equity in academics and restorative justice are significant right now. I often feel like the Trump administration's goal is to prevent our youth from discovering not only how biased many of our institutions have been and are, but also how powerful young people can be. As the Trump administration pulls funding from DEI initiatives and attacks academic freedom, we have to commit to sharing the truth with our students and providing the supports they need. In our contract negotiations last year, we fought for the inclusion of restorative justice coordinators in all schools, as research has indicated that suspensions are associated with students dropping out and being arrested.⁶ Although the CTU and CPS remain committed to restorative justice, we didn't win the guarantee of coordinators. However, we did win additional social workers and counselors, as well as limitations on using counselors' time to proctor tests, so many more schools will be able to engage in restorative justice.



COREY: I'm glad Amaziah brought up equity in academics. Our contract emphasizes including LGBTQIA+ contributions. Especially in social studies and history classes, it is important for all of our students to know about queer leaders and the history of LGBTQIA+ rights within our country, state, and city. And it's vital for our queer students to be able to see that they are a part of this history and that their voices matter.

But that doesn't end at social studies. LGBTQIA+ identities can and should be woven through every single topic within a school community and throughout the curriculum. In my world music class, we talk about the way that gender is conceptualized in various places throughout the world and how that relates to music, which can be very gendered.

For many students, seeing themselves in the curriculum is transformative. One student who graduated in 2025, I'll call him John, was very disconnected from others when he started high school. He had a lot of insecurities related to being a trans person—and not seeing other students like him—but fortunately he had one person who was his girlfriend throughout the entirety of high school. John was in the choir, which I lead, all four years. I watched him gradually become more secure in his identity, more confident in the way he talked with other people and made friends. That growth was directly impacted by the inclusiveness of my curriculum and of our whole school. For example, in English, each senior had to select a topic and write a research paper. John focused on gender-affirming care, producing one of his better works—he was very proud of it. I'm not an English teacher, but he asked me to read it because he was so excited.

When students are able to make meaningful connections and see their identities in the curriculum, when they can shape their learning experience through their identities, they're able to thrive in school. It's beautiful. My job is to ensure that all my students have access to these inclusive, enriching learning experiences that are meaningful to them and that help them grow.

Sadly, John's interest in researching gender-affirming care was partly driven by the Trump administration. He planned to go into the military after graduating high school, but Trump no longer allows trans people in the military.⁷ John has long looked forward to gender-affirming care—he scheduled his first appointment when he turned 18. But under the Trump administration, he fears that he won't be able to complete the process and have his body match who he is. I'm glad that our approach to education has helped him learn about and think through these concerns.

AMAZIAH: Educators didn't sign up to be immersed in politics, but this fight has been brought to us. I have to engage because I care about what my students have the opportunity to learn—in school and in our museums and libraries. This work is not for the faint of heart. I feel an urgency of need to step up in every way, in every facet of my life. Not only the way I teach, but also how I fortify myself with knowledge, where and how I get news, and the care I take in avoiding sharing my personal views while I'm teaching.

My dedication to academic equity and inclusiveness centers on being safe and welcoming for all students. My role as an educator is to provide students with the space to form their own opinions



"We utilize our contract to establish a protective force field around our students, ensuring that the resources they require remain intact."

—Amaziah Burton

and reach their own conclusions about current events—while ensuring that they have the evidence to back up any claims that they want to make. Today, with the abundance of disinformation online, I strive to teach students how to evaluate the quality and trustworthiness of their sources.

I want my students to see that it's OK to tell the truth, whether people like it or not. What's crucial is being able to back up your claims with evidence, to explain why you've reached a particular conclusion. If you have the right information, you can be dangerous. But you can also be dangerous if you believe a lie. I want my students to know how to discern the truth and to have the courage to speak it.

We devote a lot of time to figuring out which sources are reputable. Students receive a lot of information on social media, so they need to learn how to evaluate it critically. "Trending" does not equal "trustworthy." We work on checking sources, but with deepfakes, it's only getting harder. I'm encouraging my students to have face-to-face conversations. If they can find a person with firsthand knowledge, they should talk to them instead of simply believing a 30-second video online.

EDITORS: Is there anything you'd like the CTU to prioritize as it continues to bargain for the common good?

AMAZIAH: I'd love to see further expansion of our Sustainable Community Schools program, which offers much-needed coordination, curriculum, program design, and funding, and brings educators, parents, students, administrators, and community partners together. I assisted with Phillips High School's applica-



tion before transferring—and I know my former colleagues will continue securing the partnerships they need to develop a successful application. Many Phillips students are in and out of foster care and shelters. They need additional supports to connect them with resources and help them heal. They need the rigorous education that all youth need, and they also need rigorous education for trauma.

For most students, attendance would be more consistent if Phillips became a Sustainable Community School. Community partners could offer fun and engaging after-school activities, such as dance, and could enhance our athletic programs. Plus, partners could support families with food pantries, healthcare, and evening courses, which would increase family involvement. Phillips wants to have its doors open later so that parents and guardians can grow and learn right alongside their teens.

I'm focused on Phillips because that was my school, but the Sustainable Community School model would benefit all CPS students. I'm sure the CTU will keep fighting to expand it.

COREY: Like Amaziah, I'm hoping for more of what we're doing. You might think that LGBTQIA+ students would be safe in CPS, but just last year we had principals and assistant principals directing their staff not to teach specific lessons within CPS's Skyline curriculum because they include a trans kid. According to those administrators, these Skyline lessons prevent students from having the right to believe in only two genders. We also have principals who are actively trying to push out teachers who become GSA advisors; they claim their schools don't have any LGBTQIA+ students. That's obviously not true. If you don't have queer kids in your school, it's not because they're not there; it's because they're hiding from you because they don't feel safe.

Thankfully, the CTU and CPS are steadfast. Our shared goal is to have a GSA and a gender support coordinator in every school. Some of our plans have to be revamped because they were supported by a federal grant before the Trump administration started slashing funding, but we'll press forward one way or another.

EDITORS: You are both union activists. Is there anything you want to share with AFT members across the country who are just starting to become active?

COREY: I knew nothing about the CTU before I became a member. I had learned a little about unions in history courses—particularly how we have advanced workers' rights—so I was proud to become part of the labor movement. Right away, I saw that being a member of the CTU meant I would not have to face being a teacher alone. We have our school communities, but the principal can change any day. In my first six years of teaching, my school had four principals. Each has been wildly different, ranging from supportive to making me feel unsafe. It's comforting to know that no matter who is heading my school, I have a union that is willing to fight for me.

For anyone who is interested in getting involved with their union, just show up. Talk to your union staff, democratically elected leaders, and anyone else who's involved in the union. It's so important right now. Each of us has to be part of something bigger because we cannot survive this political moment on our own. Unions have power, and workers have power through their unions.

I'm deeply proud of my union. I love my union for giving me the opportunity to do this work. The CTU enacts the motto "Nothing about us without us." It asks queer and trans teachers to lead the work regarding what queer and trans teachers need to be safe and to bring their full selves to their work. The CTU lifts our voices, ensuring we shape our contract and our work.

"Each of us has to be part of something bigger because we cannot survive this political moment on our own. Unions have power, and workers have power through their unions."

—Corey Blake

AMAZIAH: I agree. I volunteer frequently with the CTU because this is what democracy looks like. I love the CTU's commitment to bargaining for the common good. We utilize our contract to establish a protective force field around our students, ensuring that the resources they require remain intact. CPS is in debt—and the state of Illinois owes the school system about \$1.6 billion—so it's all the more vital that we keep fighting for what our students need.

Another thing I love about the CTU is that it is helping me grow. A couple of years ago, I graduated from the CTU's summer organizing institute; more recently, I completed its policy fellowship. Currently, I'm pursuing National Board Certification with the CTU's support through the Nurturing Teacher Leadership program. The National Board process is very tough and strategic—and it's making me a better educator. I'm grateful for the challenges that have helped me become a more polished diamond. ■

For the endnotes, see aft.org/ae/winter2025-2026/blake_burton.

The Illusion of Performance

And the Staying Power of Deep Learning



By Paul A. Kirschner, Carl Hendrick, and Jim Heal

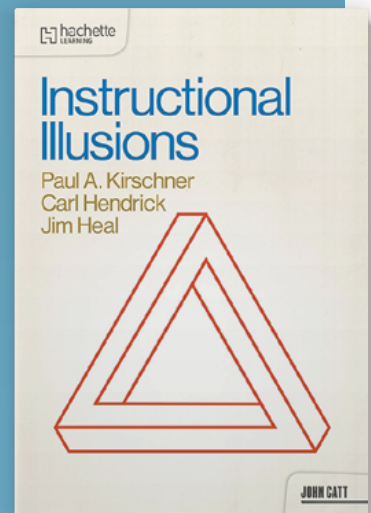
In their fascinating book *Sleights of Mind: What the Neuroscience of Magic Reveals About Our Everyday Deceptions*,¹ three neuroscientists describe the deep truths that magic reveals about the everyday cognitive deceptions that pervade our lives. Among the many points of confluence between magic and the mind, *Sleights of Mind* explores how our brains interpret and “make up” the world based on limited informational input, how attention is a scarce resource that illusionists can use to their advantage, and how memory is so unreliable that our recollections of events are prone to manipulation. Ultimately, they show that illusions only work because humans are cognitively predisposed to being deceived.

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So much of what happens in the process of learning and instruction is obscured from view. Much like the effects of a convincing illusion, what we *think* we see when we observe instruction is often far from the reality. In our new book, we explore 10 instructional illusions through the lens of educational psychology, cognitive science, and instructional design. Together, we consider how such illusions operate, unmask their true nature in light of the evidence, and present powerful alternatives for authentic teaching and learning. Look beyond the illusion and reveal the true nature of instruction.

–P. A. K., C. H., and J. H.

To receive a 15 percent discount, visit go.aft.org/u2x and use the code **InstructionalIllusions15** by **March 31, 2026**.



In this sense, every walk of life has the potential to deceive us—yet few professions are implicated by the dissembling power of illusion more than education. After all, so much of what occurs when we learn is obscured to the outside observer, and often what we think we are seeing is distant from or even diametrically opposed to what’s really happening.

We decided to write our new book, *Instructional Illusions*, to highlight crucial ways that what seems to be going on in a classroom may deceive us, making certain approaches to learning appear more effective than they really are. Across its chapters, we lift the veil on 10 educational illusions to demonstrate how the surface phenomena of teaching don’t tell the whole story. With reference to evidence from the worlds of cognitive science and educational psychology, we show that understanding how learning occurs can give us the eyes to see what lies beneath—what works and what merely appears to work. Teaching is not a straightforward process but rather a multifaceted endeavor, the complexity of which is dizzying to comprehend, if one decides to look closely enough.

von Osten, a mathematics teacher and amateur scientist, Hans seemingly solved mathematical problems and recognized written words. A typical feat would involve von Osten asking Hans a math question such as “What is $3 + 4$?” at which point Hans would respond by tapping his hoof seven times. Scientists, educators, and even the German Board of Education were floored, as Hans’ responses were accurate an astonishing 89 percent of the time.⁵

Experts far and wide were convinced of Hans’ mathematical ability until psychologist Oskar Pfungst noticed something no one else had the eyes to see. He realized Hans was not doing mathematics at all but was instead responding to subtle, unconscious cues from his questioners. When someone posed a problem, they would involuntarily tense up as Hans approached the correct number of taps. Once Hans reached the correct answer, the questioner would subtly relax—often by a slight movement of the head, change in posture, or breath adjustment—which signaled Hans to stop tapping.

Though we are not suggesting human learners are akin to a foot-tapping horse, there is nevertheless a worthwhile comparison to draw: just as Hans’ performances created an illusion of



Understanding how learning occurs can give us the eyes to see what works and what merely appears to work.

The ideas we explore are illusions, not myths. Though much has been written about the scourge of edu-myths like learning styles² or learning pyramids,³ the ideas we explore are not merely characterized as debunked. They are instead cases in which the outward appearance of effectiveness masks a deeper truth about what really works and why.

As such, our task is not to slay myths but to unveil aspects of education that appear to make sense but, upon closer inspection, prove to be much more complex. For when we bring an evidentiary lens to bear on instructional illusions, we reveal secrets that have been hiding in plain sight all along. In this article, we share one illusion—performance masquerading as learning—and suggest practical instructional strategies (with strong research backing) for teachers to ensure deep learning, not superficial performance.

The Performance Illusion

“We may feel we have learned something simply because it is fresh in mind, but that feeling is fleeting.”⁴

In early 1900s Berlin, a horse named Hans stunned audiences by seemingly displaying human-level intelligence. Owned by Wilhelm

understanding, students’ classroom performances can create similar illusions of learning that mask what’s really happening beneath the surface.

Here we will discuss *performance* and *learning*, two seemingly synonymous but very different phenomena, and reveal a pervasive illusion: certain teaching and learning strategies that are beneficial for performance aren’t good for, and can even impede, learning.

The Illusion

To address this illusion, we first need to define *performance* and *learning* in accurate terms. What we teach may temporarily go into our students’ memories, and during or directly after instruction they may be able to discuss ideas with classmates, answer questions, and even do their homework correctly. But it isn’t learning if what was taught can’t be recalled and used the next week, month, or year. Cognitive scientists Nick Soderstrom and Robert Bjork write:

The primary goal of instruction should be to facilitate long-term *learning*—that is, to create relatively permanent

changes in comprehension, understanding, and skills of the types that will support long-term retention and transfer. During the instruction or training process, however, what we can observe and measure is *performance*, which is often an unreliable index of whether the relatively long-term changes that constitute learning have taken place.⁶

Performance is a short-term change in one's knowledge or, as Soderstrom and Bjork write, "Temporary fluctuations in behavior or knowledge that can be observed and measured during or immediately after the acquisition process."⁷ Some researchers refer to this as *intermediate-term memory*, lasting little more than a few hours. A student might remember the content during or shortly after a lesson, but it's usually quickly forgotten. How many of you reading this have taught something and even administered a test that your students passed, only to find that after the weekend, they stared at you blankly when you mentioned it? In other words, the knowledge gained is fragile. It's easily disrupted, error-prone, and quickly forgotten. With respect to performance, relearning is actually reacquisition. It takes almost as long to reacquire the lost knowledge as it took to acquire it the first time.

Learning, on the other hand, is a change in long-term memory (the mind's seemingly limitless, close-to-permanent storage facility),⁸ and that's the real goal of education: enduring changes in knowledge, skills, and behavior for long-term retention and transfer to new situations. Learning is stable; what you've learned deeply and durably isn't easily forgotten.

Of course, you can't always remember everything you've learned, but traces of it reside somewhere in your long-term memory. Therefore, relearning what you've forgotten goes much more quickly than initial learning. To paraphrase Alfred, Lord Tennyson: "'Tis better to have learned and lost than never to have learned at all."⁹ Take riding a bicycle, for instance. If you haven't ridden a bike in 20 or 30 years, you'll be very shaky and will probably fall when you first get back on. However, within a short time—a lot shorter than it took to learn to ride the bike decades ago—you're again able to ride fairly proficiently.

Performance requires very little cognitive processing, and this minimal processing is shallow.¹⁰ Often, it requires nothing more than simple repetition (this could include the verbatim copying of a text to your notes or project rather than paraphras-

ing or summarizing it in your own words) or rehearsal in your working memory. Think of what happens when someone tells you their telephone number. You might repeat it a few times and remember it directly after hearing it, but the chance is slim that you'll remember it that evening or tomorrow. You've not processed the information in a meaningful way, and thus it doesn't get integrated into the knowledge schemas* in your long-term memory. Shallow information processing involves a minimal level of cognitive engagement. Simply repeating or rehearsing information—often without trying to understand its meaning—doesn't lead to deeper connections or integration of the information into existing knowledge structures.



It isn't learning if what was taught can't be recalled and used the next week, month, or year.

Learning, in contrast, involves deep processing activities like elaboration, reorganization, and critical thinking. This meaningful and active engagement with the to-be-learned information leads to better comprehension and long-term retention. It requires a lot of mental effort to actively process, analyze, and synthesize information, including understanding the new information by relating it to prior knowledge (schema acquisition and elaboration) or by applying it in new contexts (transfer).

*Human brains automatically organize knowledge in networks of interconnected ideas. These networks are known as *schemas*, and the more we come to know about a particular domain of knowledge, the more sophisticated that schema becomes.

Performance	Learning
•Short-term change in knowledge	•Change in long-term memory
•Fragile	•Stable
•Little/shallow cognitive information processing	•Much/deep cognitive information processing
•Fragmentary	•Cumulative
•Easily observed and measured	•Must be derived from something else

Performance is fragmentary. It very often focuses on memorizing discrete facts or pieces (fragments) of information without understanding how they relate to each other or to prior knowledge.* It also involves processing surface-level details such as definitions, isolated dates, or formulas without the information being connected to broader concepts or patterns. This makes the acquisition process disjointed and compartmentalized.¹¹

Learning, however, is cumulative. It emphasizes connecting new information to prior knowledge such that each new piece of learning builds on what has already been learned. This is a cumulative process that strengthens understanding and retention because the learner continuously links new ideas to existing schemas in long-term memory, which leads to richer, more interconnected knowledge structures.

Finally—and this is likely the biggest problem with teaching for learning—performance is easy to see and measure, but learning isn't. All you need to measure performance is a test or exam at the end of a week or unit. Students cram the night before, “learn” it, and then regurgitate it.

amateur's sleight of hand, expert teachers develop a refined ability to distinguish between the illusion of performance and genuine learning. This expertise isn't mystical—it's a carefully honed set of observational skills and diagnostic techniques.

Luckily, teachers have an arsenal of instructional techniques that we can use to stimulate learning. The two most well-known and effective sets of techniques are desirable difficulties¹² and generative learning strategies.¹³

Desirable Difficulties

Desirable difficulties are learning conditions that are often experienced by the learner as requiring more effort, but that have a positive effect on learning and the transfer of knowledge and skills. They were identified by cognitive scientists Robert and Elizabeth Bjork, whose research found that “Conditions of learning that make performance improve rapidly often fail to support long-term retention and transfer, whereas conditions that create challenges and slow the rate of apparent learning often optimize long-term retention and transfer.”¹⁴ The



Expert teachers can develop a refined ability to distinguish between the illusion of performance and genuine learning.

Learning is difficult to measure. Assessment of learning needs to be delayed, derived from other things, and done in combination with other learning. To measure learning, you need to cumulatively test and/or use assessments that involve analysis, synthesis, and evaluation. In other words, learning implies mastery, and measuring true mastery is complex, time-consuming, and often subjective.

We're by no means saying that performance is bad or that it shouldn't be measured. What we're saying is that performance and learning shouldn't be confused. The ultimate goal of teaching should be to ensure that students learn. You want what you've taught to be remembered, retrieved when needed, and applied in familiar and new situations (transferred).

Unmasking the Illusion

Just as skilled illusionists can spot the telltale movements of an

following five desirable difficulties focus on slowing the rate of apparent learning so that long-term retention and transfer are optimized.¹⁵ The Bjorks call it “making it difficult but in a good way.”¹⁶

1. *Interleaving/variable practice*: In interleaving, you vary the conditions of practice. You mix (i.e., interleave) practice on several related skills together. In other words, you don't block practice, repeating the same type of task over and over again, but rather shuffle tasks around. For instance, a tennis player, after having acquired the skills of hitting a forehand, backhand, and volley, will alternate practice between them. After all, that is also what is needed when playing tennis.
2. *Contextual interference*: Contextual interference is doing the same thing often but in different situations or contexts. It is very similar to interleaving, but here you make the task environment—not the task itself—more variable or unpredictable in a way that creates a temporary interference for the learner. For instance, did you know that even studying the same material in two different rooms leads to increased recall of that material?

*To learn more about performance, and the difference between an *information-rich* and a *knowledge-rich* curriculum, see *Developing Curriculum for Deep Thinking: The Knowledge Revival*. This book by Paul A. Kirschner and several other experts in the science of learning is available for free at go.aft.org/2i8.

3. *Spaced practice*: This is also known as “distributed practice” and is about spacing learning over time. Instead of studying for an hour and a half, you split your studying into three 30-minute sessions with one or more days in between. Distributing practice (e.g., learning tasks, study attempts, training trials) supports long-term retention through consolidation (giving your brain the chance to let things gel) and retrieval practice (recalling what you’ve learned—more on that below).
 4. *Reduced feedback*: Reducing feedback frequency and specificity makes life more difficult for learners during training but—as with all desirable difficulties—can enhance long-term performance. It stimulates their independence, knowing that the instructor won’t give them the answer in the end. Examples of reducing feedback are giving summary feedback at the end of a practice session or “fading” the frequency of feedback over sessions.*
 5. *Retrieval practice/practice testing*: In a nutshell, practice testing challenges learners to recall what they’ve previously learned, usually as opposed to rereading. When they actively remember that information—retrieve it from their memory—they can remember it better and longer. Ideally, initial learning should reach the point of basic proficiency. When retrieval practice starts, students need to try to recall—to attempt to retrieve—the content. When students correctly recall an answer, they will be able to more easily recall it in the future, and it may improve their mental organization of the information. When students are not able to recall, there is a cognitive benefit to making a genuine attempt (even if it is incorrect) before looking up the correct answer. For example, if a student is reviewing a flash card but flips to the solution without attempting an answer first, this is no more effective than rereading.
- *Self-explanation*: Explaining the material to oneself as if teaching it
 - *Teaching others*: Teaching or explaining concepts to others, real or imaginary
 - *Generating questions*: Having learners create their own questions about the material
 - *Imagining*: Mentally visualizing concepts or scenarios related to the material
 - *Enacting*: Acting out or physically demonstrating concepts

Generative Learning Strategies

Generative learning strategies are instructional techniques that engage learners in actively constructing their understanding of new information. The Flemish use the term *herkneden* (re-knead), as in a lump of clay that can be re-kneaded or reshaped into something else. Learners use these strategies to make sense of new information, integrate it with prior knowledge, and generate new mental representations by transforming the information into something else. This encourages and requires deeper cognitive processing, leading to better comprehension and retention. Cognitive scientists Logan Fiorella and Richard E. Mayer identified the following eight generative strategies.¹⁷

- *Summarizing*: Condensing information into a brief, coherent summary
- *Mapping*: Creating visual representations of the relationships between concepts
- *Drawing*: Creating drawings or illustrations representing the information being learned

*For more details on feedback, see “Principles of Instruction” in the Spring 2012 issue of *American Educator*: go.aft.org/ms7. In particular, see the sections on guiding student practice and on requiring and monitoring independent practice; as mastery progresses, systematic feedback is reduced.

We owe it to our students to demonstrate that the road to real learning beats the fleeting nature of performance every time.



Generative learning activities supersede shallow performance demonstrations because they require deep, effortful cognitive processes such as selecting relevant information, organizing it into coherent representations, and integrating it with prior knowledge.

It’s worth noting that, in our experience, students are predisposed to seeing performance as “the main event” and learning as a necessary evil for performance. As teachers, we therefore owe it to our students to demonstrate (through approaches like desirable difficulties and generative learning strategies) that even though the road to real learning is more strenuous, it beats the fleeting nature of performance every time.

The lessons here invite us to reconsider the phrase “It’s just like riding a bike.” We now know that the meaning behind the adage is not entirely true. After all, returning to something already learned doesn’t result in instantaneous proficiency. Nevertheless, the sentiment is partially accurate in that remembering how to ride a bike comes easier than if you had never learned in the first place.

This reveals the importance of distinguishing between performance and learning: not only does one not equal the other, but focusing on the fragile, fragmentary nature of performance undermines durable, authentic learning.

Thankfully, unraveling this illusion is difficult but not impossible. Just ask Oskar Pfungst, who was able to solve the dilemma of Hans the mathematical horse in one simple step: he placed blinders over Hans’ eyes.¹⁸

For the endnotes, see aft.org/ae/winter2025-2026/kirschner_hendrick_heal.

Why Is Elementary Math Scary?

Because Incoherence Abounds in Math Programs



By Jeremy F. Alm

“I just wanted to tell you I hate math.” As a mathematics department head, I’ve heard this from too many prospective students at university recruiting events. So many students have had negative experiences in math class (myself included) that hating math class is a national pastime. But as someone who has for many years taught math to future teachers, I remain optimistic. I am convinced that students’ (and teachers’) negative attitudes are toward math *class*, not mathematics. This is because, as I try to illustrate in this article, many students have not experienced mathematics as my fellow mathematicians and I understand it: as a story well told.

Elementary mathematics, by which I mean mathematics that does not require algebra, is rich and beautiful. But it has a very bad PR department: Many of the textbooks that tell its story do it a grave injustice by not weaving a coherent narrative. When we watch a movie, following the plot requires that the narrative is coherent. We’ve all seen films that are impossible to follow because events occur for no apparent reason, without purpose or explanation. I claim that the narrative of elementary mathematics that has been pervasive in the

United States from the late 20th century to the present is like this type of bad movie. It is unreasonable to expect students to follow the plot because the plot doesn’t actually make sense.

I am a university professor, not a schoolteacher. What do I know about teaching K–12? Honestly, not much. I do not presume to tell teachers the finer points of pedagogy. What I do know is the difference between presentations of mathematics that make sense and those that do not. I have seen firsthand the harm done to young minds by having tried to survive in a learning environment in which the curriculum doesn’t make sense. Like children that grow up in an unsafe environment, they can learn survival strategies that are not conducive to thriving at the next stage of their lives or education. We must fix the curriculum.

Incoherence: Creating a Fear of Fractions

I could give representative examples of incoherence from many of the widely used elementary math textbooks, but here I’m drawing from the 2015 edition of *Texas Go Math!* for fourth grade. This was the textbook used in my daughter’s classroom at an elementary school in Texas during the 2018–19 school year.

1. Division of Whole Numbers

Suppose one wants to divide 29 by 5. There are several sensible things to write. The most immediate is $29 \div 5 = 29/5$; since 29 is

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ILLUSTRATIONS BY JAMES YANG



not a multiple of 5, the quotient is not an integer. Some might prefer the decimal 5.8. But one can make sense of division of integers without reference to fractions or decimals. Because the largest multiple of 5 less than or equal to 29 is $5 \times 5 = 25$, we can write

$$29 = 5 \times 5 + 4.$$

Students need to learn this concept, which we'll call *integer division-with-remainder*. Furthermore, they need to learn it early (see points 3 and 4 below).

Instead, in section 9.1 of *Texas Go Math!*, students are treated to this:¹

$$29 \div 5 = 5 \text{ r}4.$$

There are two major problems with this. First, $29 \div 5$ is a *number*, and $5 \text{ r}4$ is not a number. As can be seen from the relation

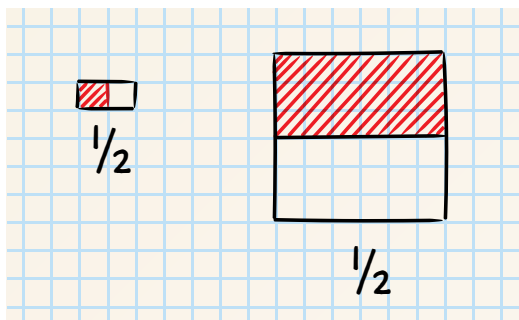
$$29 = 5 \times 5 + 4,$$

three numbers are required to write 29 as a multiple of 5, plus a remainder. The expression " $5 \text{ r}4$ " makes no reference to the divisor 5; as a result, it is meaningless.

The second problem is that, following *Texas Go Math!*, we would also get $44 \div 8 = 5 \text{ r}4$. Are we to conclude that $29 \div 5 = 44 \div 8$? We have two numbers, $44 \div 8$ and $29 \div 5$ both "equal" to $5 \text{ r}4$, but they are not equal to each other. This is not coherent.

2. Area-Model Fractions

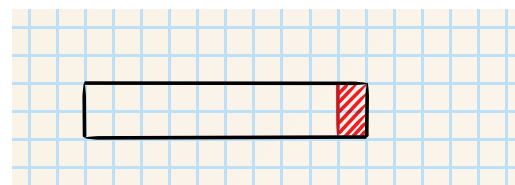
Texas Go Math! asks students to "use models to show equivalent fractions."² While there are plenty of acceptable ways to represent fractions visually, *Texas Go Math!* uses an area model that has no fixed unit. Rather, a fraction is represented by the *fraction of squares shaded*, no matter how many squares there are! For example, one can represent $\frac{1}{2}$ in the following two ways (and in many other ways):



Even worse, this approach misleads students about how large or small fractions are. Since one can represent $\frac{1}{5}$ as

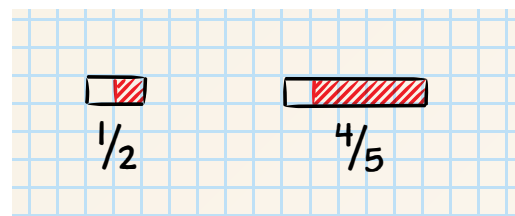


and $\frac{1}{10}$ as

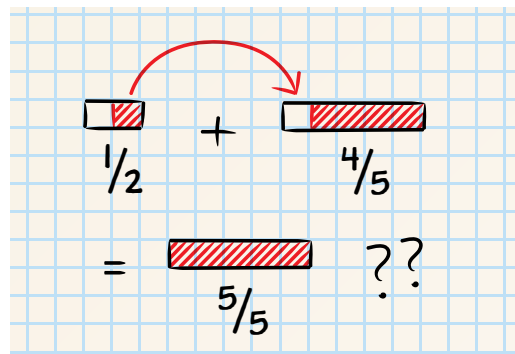


a student might reasonably conclude that $\frac{1}{10} > \frac{1}{5}$. After all, it has two boxes shaded, not just one.

Now consider the confusion that might be created when trying to compute $\frac{1}{2} + \frac{4}{5}$. Using this area model with no fixed unit, we use the simplest representations of the fractions $\frac{1}{2}$ and $\frac{4}{5}$:



Any sensible definition of addition must model our everyday notion of *combining quantities*, so one ought to be able to move the square from the representation of $\frac{1}{2}$ to fill in the missing square in the representation of $\frac{4}{5}$:



As a result, by using the model in a way that ought to make sense, a student may conclude that

$$\frac{1}{2} + \frac{4}{5} = \frac{5}{5} = 1.$$

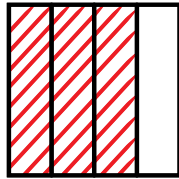
This, of course, is not what *Texas Go Math!* concludes, but the reasoning seems consistent with its use of the area model.

A more acceptable way to proceed is to *fix a unit* for the entire discussion. For example, maybe the area of a 10-by-10 grid of

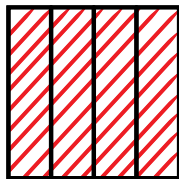
squares is assigned to be the unit 1 for a section of the text. Then area comparisons can be made directly.

Here is an example that I have used in my courses with college students in both College Algebra and Math for Elementary Teachers.

Suppose the unit 1 on the number line is the area of the following shaded region obtained from a division of a given square into 4 congruent rectangles (and therefore 4 parts of equal area):



Write down the fraction of that unit representing the shaded area of the following division of the same square.



Note that the unit is clearly defined. Also note that many of my students over the years have answered 1 to this question (instead of the correct $4/3$).

3. Mixed Numbers and Improper Fractions

Section 3.6 in *Texas Go Math!* is especially problematic. First, students are expected to write

$$2\frac{3}{6} = 1 + 1 + \frac{3}{6}$$

when they haven't learned to add fractions yet.³ Addition of fractions isn't introduced until Module 5. Second, it isn't made clear that

$$2\frac{3}{6}$$

is just shorthand for

$$2 + \frac{3}{6}.$$

Many students have not experienced mathematics as my fellow mathematicians and I understand it: as a story well told.

The correct way to show conversion from a mixed number to an improper fraction is as follows (assuming students already know how to add fractions):

$$\begin{aligned} 2\frac{3}{6} &= 2 + \frac{3}{6} \\ &= \frac{12}{6} + \frac{3}{6} \\ &= \frac{12+3}{6} \\ &= \frac{15}{6}. \end{aligned}$$

To go in the other direction, from improper fraction to mixed number, students should have learned integer division-with-remainder. Then we have

$$\begin{aligned} \frac{15}{6} &= \frac{2 \times 6 + 3}{6} \\ &= \frac{2 \times 6}{6} + \frac{3}{6} \\ &= 2 + \frac{3}{6} \\ &= 2\frac{3}{6}. \end{aligned}$$



4. Reducing Fractions

In section 3.3, students are encouraged to reduce $\frac{12}{16}$ as follows:⁴

$$\frac{12}{16} = \frac{12}{16} \div \frac{\square}{\square} = \frac{\square}{\square}$$

This is problematic for two reasons. First, fraction division hasn't even been introduced in the text yet. Presumably, students are supposed to write

$$\frac{12}{16} = \frac{12}{16} \div \frac{4}{4} = \frac{3}{4}.$$

Second, when they do learn fraction division, they will learn the invert-and-multiply rule, hence will be taught to write this:

$$\frac{12}{16} \div \frac{4}{4} = \frac{12}{16} \times \frac{4}{4} = \frac{48}{64},$$

which is totally unhelpful for reducing fractions.



The right way to teach this, at least initially, is to factorize the numerator and denominator into products of primes:

$$\frac{12}{16} = \frac{2 \times 2 \times 3}{2 \times 2 \times 2 \times 2} = \frac{3}{2 \times 2} = \frac{3}{4}.$$



When the numbers become difficult to factorize by inspection, as is the case with $\frac{391}{323}$, students who know integer division-with-remainder can easily be taught the Euclidean algorithm, which is simply repeated division-with-remainder:

$$\begin{aligned} 391 &= 1 \times 323 + 68 \\ 323 &= 4 \times 68 + 51 \\ 68 &= 1 \times 51 + 17 \\ 51 &= 3 \times 17 + 0. \end{aligned}$$

The last nonzero remainder—17 in this case—is the greatest common factor of 391 and 323, hence the reduced fraction is 23/19:

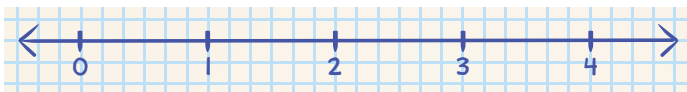
$$\frac{391}{323} = \frac{391 \div 17}{323 \div 17} = \frac{23}{19}.$$

Coherence: Fractions Are Numbers

The progression of “whole numbers, integers, fractions, rational numbers, real numbers” in the K–12 curriculum involves generalizing and extending what has come before to do arithmetic on larger and larger classes of numbers, each containing at least one of those that came before. Most difficulties for students seem to begin when moving from integers to fractions.

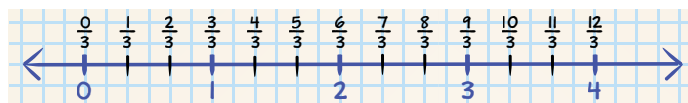
Let us consider addition: What for whole numbers and integers was counting on the number line, as in “5 + 2 is the number that is two steps to the right of 5 on the number line,” becomes for fractions either a dubious analogy with apple pies or the incoherent area model shown above. However, there is another way: The number line provides a coherent common foundation for both integer and fraction arithmetic.

For integer arithmetic, the number line looks like this:



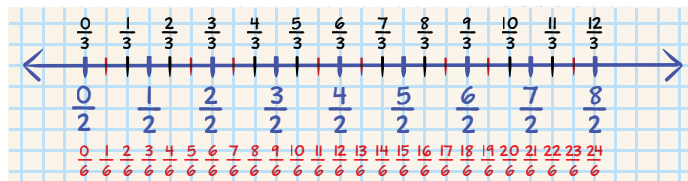
For mathematics to be understandable and enjoyable, students need a coherent narrative to serve as the basis for reasoning.

When we introduce fractions, we simply add more markings. Let’s consider thirds, for example:



Adding $\frac{5}{3}$ and $\frac{2}{3}$ is simply moving two steps to the right from $\frac{5}{3}$ on the sequence of thirds. Thus, we have generalized integer addition by expanding the number of equally spaced sequences of points on the number line.

When students are ready to add fractions with different denominators, we must ask “How do we find a sequence that contains both $\frac{1}{3}$ and $\frac{1}{2}$?” The need for a *common denominator* becomes clear geometrically.



Fraction arithmetic is a modest generalization of integer arithmetic. When it is taught with a coherent narrative, it is not scary.

Parting Thoughts

In research-level mathematics, we often play around with toy examples until we grasp enough to build a theory that captures what’s going on in the examples. The elementary school version of this is to let students explore specific cases to start to build some intuition, then provide a coherent narrative that can be the basis of reasoning (which is just the age-appropriate version of proof). It’s great to have students explore with manipulatives, for example, for building early intuition and helping make the definitions seem sensible. But in order for mathematics to be understandable and enjoyable—beautiful, even—students still need a coherent narrative to serve as the basis for reasoning. Playing with egg cartons is great, but students’ ability to follow the plot depends on the number line.

For the endnotes, see aft.org/ae/winter2025-2026/alm.

What Do IQ Scores Mean?



By Eric Turkheimer and Daniel T. Willingham

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.

Eric Turkheimer is the Hugh Scott Hamilton Professor of Psychology at the University of Virginia. He is a past president of the Behavior Genetics Association and a fellow of the American Academy of Arts and Sciences. In 2024, he won the Dobzhansky Founders Lifetime Achievement Award for outstanding lifetime contributions to the field of behavior genetics. His most recent book is Understanding the Nature-Nurture Debate. Daniel T. Willingham is a professor of cognitive psychology at the University of Virginia. He is the author of several books, including the bestseller Why Don't Students Like School? and Outsmart Your Brain: Why Learning Is Hard and How You Can Make It Easy. 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.

QUESTION: What does an IQ score actually mean? On the one hand, I've heard people say that these scores are meaningless—a high IQ simply shows that the child is good at taking intelligence tests. On the other hand, I know that some districts use IQ test scores as gatekeepers for their gifted and talented programs. What is the science behind IQ scores?

ANSWER: An IQ score is a summary of how successfully a child can answer the types of questions that are frequently posed in school, especially questions that require thinking abstractly with words, numbers, or space. This summary number is not meaningless because it predicts students' success in school and in many jobs.

But IQ is frequently misunderstood by educators, families, and the general public. Instead of being recognized as a summary of correctly answered questions, it's believed to be a measure of an internal essence within the child that many call their *learning potential*. But there is little evidence that such an essence exists at all, let alone that IQ tests measure it.

A better way to think about an IQ score is as a snapshot of achievement *now*, rather than future potential. This conceptualization offers a better lens for how we might enable all children to answer more questions correctly—that is, to raise their IQs.

You have no doubt noticed that some children learn faster than others, can comprehend more difficult concepts, and are therefore easier to teach. Everyone knows this; we perceive it in daily life outside of schools too. We expect that children and adults are valued and respected regardless of how quickly or easily they learn, but the differences are there for anyone to observe. Understanding these differences may help us teach more effectively.

But how should we go about describing or measuring these differences? In the early 20th century, the French government faced many of the same problems we face today, including overcrowded and underfunded schools filled with struggling students. The French psychologist Alfred Binet was a leader of a group of teachers and administrators (*La Société Libre pour l'Étude Psychologique de l'Enfant*) who were interested in taking practical steps to improve education, including by developing a standardized measure that would predict how well students were likely to do in school.¹ Along with the psychiatrist Théodore Simon, in 1905 Binet developed what is now recognized as the first intelligence test; through multiple measures, it assessed rea-



IQ is a
snapshot of
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soning, attention, and problem-solving abilities.² Binet intended his test as a diagnostic tool for children experiencing difficulties in school and did not use the term *intelligence quotient* (IQ). He was suspicious of attempts to boil the results of his measures down to a single number.

Unfortunately, when the idea of testing cognitive ability caught on around the world, especially in the United States, it was adopted by people who were not motivated by a desire to help children and not concerned with the consequences of describing ability with a single, reductive number. The American psychologist Henry Goddard referred to tests based on Binet and Simon's assessment

as *intelligence tests*, and in 1912, the German psychologist William Stern came up with *intelligence quotient*, or the now-familiar IQ. These new tests were sometimes used for diagnostic purposes in schools and the armed forces, but they were deployed more vigorously in eugenic breeding programs (designed "to produce a highly-gifted race of men") and anti-immigration screening (with some would-be immigrants arriving at Ellis Island determined too "feeble-minded" to enter the United States).³

Concepts of Intelligence

The divergence between Binet's concept of his assessment as a diagnostic educational tool and the use of IQ scores to promote eugenics and screen out immigrants comes down to a modern idea called *essentialism*. In the century that has followed since intelligence tests were first developed, we have become accustomed to thinking about IQ as a thing, an essence, that people carry around with them and that explains their performance in school, on the job, and elsewhere. This is an *essentialist* concept of intelligence, so named because it holds that intelligence is an essence within the individual. This view is incorrect.

Intelligence tests are not measures of an essence. Intelligence tests measure people's tendency to give correct answers to questions—for example, spelling words correctly, recalling information accurately, and solving abstract puzzles quickly. But an intelligence test is not some kind of mental X-ray machine, identifying an inner quality that explains people's performance in the real world. IQ tests are a *description* of the fact that some people are more accurate thinkers than others, not an *explanation* of why they are. This is the non-essentialist conception of intelligence: An intelligence test score is a statistically sophisticated summary of a person's tendency to answer questions correctly.

Once you know where an IQ score comes from, it's easy to see that it doesn't *explain* anything. If someone asks, "Why did that 10-year-old excel on that algebra test?" you might be tempted to look up her IQ score, see that it is high, and answer "She must be very intelligent." But this explanation is circular. We know she's intelligent because she answered a lot of questions correctly on an IQ test. Now she's answering more questions correctly on the math test. Intelligence, like "health," is not an essence⁴ that causes things. It is a description.

Insisting that IQ is not an essence does not dismiss its importance: Being able to spell correctly, do math in your head, and reason accurately are important skills that we want our children to have. You sometimes hear, "Scoring well on an intelligence test only means you're good at taking intelligence tests." That's not true. Good performance on intelligence tests predicts positive outcomes in a wide variety of other domains. Higher scores on intelligence tests predict better grades in school and better job performance in a variety of careers.⁵ At least within North American and European cultures, intelligence tests predict success for everyone, regardless of income, wealth, or gender.⁶ Even though intelligence tests don't explain *why* some people do better than others in school or on the job, they are effective at predicting *who* will perform better.

Why Did an Incorrect Concept Take Hold?

Two developments in the early history of intelligence research contributed to essentialist thinking. The first was the discovery

that all cognitive ability tests are positively correlated. The second was advances in genetic research.

It is natural to think of human ability as a complex profile in which some of us are good at some things and some of us are good at others, but in the long run it all evens out; if you're bad at math, for example, you're probably good with words. That is true, to some extent—some people are better with numbers, whereas others are better with words—but on average, it's actually the case that people who get higher scores on a test of one skill also get higher scores on tests of others. In fact, a study from 2008 of 1,800 Americans who took the 15 ability tests that constitute the Wechsler Adult Intelligence Scale IV found that scores on all 15 tests were positively associated.⁷ Even though the tests measured abilities as different as vocabulary, arithmetic, spatial thinking* and working memory,[†] scoring well on one test was associated with scoring well on the others.

This positive correlation was well established by the 1920s, and the psychologist Charles Spearman developed a statistical method called factor analysis that quantifies this tendency.⁸ He named the statistical factor that describes the ability to perform well across a wide range of cognitive tests *g*, for general intelligence. Because it is tempting to think of *g* as an essence diagnosed by IQ tests, *g* probably led more people to adopt the essentialist view of intelligence. But that's not what IQ means; it is simply a number that summarizes a person's scores across a wide range of skills. (Again, we are not saying that a high IQ score is unimportant. Doing well across a wide range of skills is a desirable trait.)

Progress in the study of human genetics also seemed to favor essentialism. You might remember learning about Gregor Mendel's pea plants, which involved single genes (dominant or recessive) that were expressed in the plants by a trait being present or absent. *Quantitative* genetics is concerned with traits like height or intelligence that are not just present or absent but can have a continuum of values. These continuous traits are determined by multiple genes and environmental factors. New techniques in quantitative genetics were developed side by side with the study of intelligence in the early 20th century, by many of the same researchers.

One method they developed was to compare the intelligence of people who varied in the similarity of their genetic makeup. Identical twins share 100 percent of their genes, of course. Siblings and fraternal twins share 50 percent, on average, and half-siblings share about 25 percent. Adoptive siblings share none of their genes, on average. Research produced a somewhat surprising finding: The more genetically related people are, the more similar their IQ scores were, even after controlling for environmental factors like family wealth.⁹

This phenomenon was anointed with an essentialist-sounding name: *Heritability*. Heritability sounds as though it means “passed in the genes from parents to children.” Under some circumstances—like some features of farm animals raised under tightly controlled

conditions—that description might not be a bad fit. But in humans, living and reproducing as they please, heritability means much less than that. Here's why: *Everything* is heritable. The likelihood that you'll get a divorce is heritable. How often you go to church is heritable. So is basketball skill.

But that doesn't mean these heritable traits were passed along genetically. The effects can be indirect. For example, genes might influence (but not determine) your height (which is also impacted by factors like nutrition and health as a child), and being tall might give you a slight edge over other kids when you play basketball. You start out

IQ tests are a description of the fact that some people are more accurate thinkers than others, not an explanation of why they are.



a little better than other kids, so you're picked first when choosing teams during a recess basketball game. That makes you like basketball more. So you practice, which makes you better, which in turn brings more pleasure. It's the practice that makes you good at basketball, and your height (the genetic effect) nudged you toward practicing.¹⁰

Intelligence may be the product of dozens or hundreds of such indirect effects. Heritability applies to the averages of large groups of people, where all of these effects get combined, so their net effect is easy to observe. But the relationship breaks down when you try to describe the particular causes in an individual case.

During the 20th century, researchers seeking to explain the heritability of intelligence had to rely on methods like comparing identical and fraternal twins. But in the last 25 years, the human genome has been sequenced, and we have much-improved images of the human brain as it thinks. Scientists have mounted an effort to estimate essential intelligence using only brain images or DNA sequences. The results, while “statistically significant,” are nowhere close to a level where they might be informa-

*To learn about spatial thinking, see “Picture This: Increasing Math and Science Learning by Improving Spatial Thinking” in the Summer 2010 issue of *American Educator*: go.aft.org/4th.

†For an explanation of working memory, see “How Can Educators Teach Critical Thinking?” in the Fall 2020 issue of *American Educator*: go.aft.org/3su.

Differences in intelligence arise from processes that involve genes, brains, and environments in complex ways.

tive or useful (or dangerous, as in a new eugenics movement), and there is little indication that this state of affairs is going to change anytime soon.¹¹

For now, what scientists know is the obvious: Differences in intelligence arise from processes that involve genes, brains, and environments in complex ways that we can't untangle in individual people. Is that 10-year-old algebra whiz a prodigy because of her genes, her teachers, her nutritional regimen, her tiger mom, or some combination? Neither scientists, teachers, nor parents have any idea.

Still, we have to add a caveat similar to those we attached to IQ: We are not saying that genet-

stay in school longer. With the right methods, however, we can pull apart these reciprocal effects.

Here's an example of how it can be done. Naturally, children can answer more questions correctly as they get older, but is that because they have been to school longer or because they have had more experiences outside school from which they've learned? We can examine the relative contributions of in-school and out-of-school learning to IQ by capitalizing on school enrollment age cutoffs. Suppose that to enroll in kindergarten, a child must be five years old by September 30. Every June, we can test the IQs of a group of children who are very close in age, but some of whom started kindergarten a year later (because their birthday was just after the cutoff). Is the average IQ of the pre-September 30 children (who have attended one more year of school) higher than their later-birthday peers?

In a landmark 2018 paper, researchers analyzed studies using this method and two other research designs that enable researchers to estimate the impact of schooling on IQ.¹³ Combining the three methods, they concluded that attending school does make you smarter. By their reckoning, each additional year of education improves IQ between one and five points.

Other interventions known to increase intelligence include transferring to a better-resourced, more challenging school, or increasing the number of years of compulsory education.¹⁴ But if we look for a more general description of environmental changes that increase cognitive performance, we learn three things: Effective changes start early, are comprehensive, and last a long time, ideally forever. Although it is obviously not something that could be broadly implemented to make kids smarter, the best example of effective environmental change is adoption into a family situation that provides rich opportunities for learning.

There is a long-standing scientific literature demonstrating that adoption from impoverished circumstances into middle-class homes is associated with IQ advantages of at least 15 points (compared to the adoptee's parents or non-adopted siblings).¹⁵ Even in modern Sweden, where legislative choices have established a strong social safety net and therefore poverty is relatively rare, adoption into more economically advantaged homes is associated with significant increases in IQ.¹⁶ Of course, no one proposes that children from low-income families should be adopted to improve their intelligence, but these studies are important for showing the power of an environment that offers abundant learning opportunities and supports.

Another reason to believe that cognitive ability can improve is the Flynn effect, perhaps the most dramatic and well-established finding in the history of intelligence research. The researcher James Flynn analyzed the results of intelligence tests administered from the 1930s to the 1980s and found that average intelligence had increased by between 5 and 25 points per generation.¹⁷ These increases cannot possibly be genetic in origin. Large-scale genetic changes in human populations take thousands of years, yet IQ scores have risen dramatically within just a few decades.

The reasons for the Flynn effect are complicated, but a consensus has emerged that they involve the modernization of society. In 1910, most Americans worked on farms or in manufacturing; thus, the cognitive challenges they met tended to be the same, day after day. In modern economies, more and more jobs present a stream of novel problems. What's more, those



ics has nothing at all to do with why some people perform better on intelligence tests. Rather, we are saying that we have no specific scientific knowledge of genetic reasons that one child performs better than another, and we don't appear especially close to discovering any.

Can Teachers Increase a Child's IQ?

The way we've conceptualized IQ, this question amounts to asking, "Can teachers succeed in making children better thinkers and learners?" Once you ask it that way, two answers are obvious:

1. Of course we can.
2. It ain't easy.

Alfred Binet put it this way: "With practice, training, and above all, method, we manage to increase our attention, our memory, our judgment, and literally to become more intelligent than we were before."¹²

But of course, the relationship between schooling and intelligence is not easy to study because it works both ways: Education improves thinking, and thinking well increases the tendency to

problems increasingly require the mental manipulation of abstract symbols like numbers, charts, and specialized concepts used in fields like finance, engineering, and law. The ability to manipulate abstract concepts is largely what IQ tests measure. Our abilities change and improve in response to the world in which we are immersed.

What Does All This Mean for Teachers?

Some children show up on day one ready and eager to learn. They devour the educational sustenance that is provided to them. Others seem entirely unready, and our greatest efforts produce only minimal gains. The first kind of child gets a high score on an IQ test, and the second gets a low score. Isn't the problem that children with a low IQ can only be expected to learn so much?

The answer is threefold. First, as we have described, an IQ score is not an explanation of why some children do better in school than others; it is a description of it, a quantification. Second, even if it is the case that some kids are born with more effective brains than others, there is no way to diagnose this in individual children, certainly not with intelligence tests. IQ tests measure where a child is, not where they could potentially be. Third, the fact that cognitive ability and IQ scores are difficult to change is not an indication that they are baked into the genes at conception. Positive or negative behavioral patterns are always difficult to change once they are established, no matter where they came from. That's true of how well children answer questions, how they interact with peers, how they cope with difficult emotions, and more.

So here is our bottom line: Intelligence tests are a useful way to describe and quantify differences in cognitive functioning among people in general and schoolchildren in particular. In the hands of a qualified psychologist, they can be used to identify individual strengths and weaknesses, and they do a good job of predicting future performance—but not potential. If circumstances change, outcomes may change too.

Intelligence tests do a good job of predicting future performance not because they provide insight into mental capacity, but because the circumstances that led to a high IQ score in the first place are likely to persist. Children who have had access to environments that provide rich opportunities for learning will probably have access to those sorts of environments in the future. The child who has had a lot of success with academic tasks will likely



have more confidence when taking on tasks in the future and persist longer when tasks are difficult. These processes no doubt combine with preexisting genetic differences to some extent, but the two cannot be meaningfully disentangled, especially in individual children.

Making significant improvements in anyone's thinking is never easy, and it is more difficult with children who have had less success in the past. But it's helpful to know that a low IQ score doesn't equate to a hard-and-fast limit on what a child can achieve. And whether the child has a history of success or struggle in the past, the broad guidelines for future success are the same: Start as soon as possible, be comprehensive, and persist. ■

For the endnotes, see aft.org/ae/winter2025-2026/turkheimer_willingham.

IQ tests do a good job of predicting future performance—but not potential. If circumstances change, outcomes may change too.



How to Help Students Become Better Learners

Helping students increase their IQ scores is hard, in part because a wide range of abilities is assessed. Thankfully, helping students perform better—and learn more—in a specific subject or course is not as difficult. Here are a handful of “Ask the Cognitive Scientist” articles that capture key points about how learning and memory work, and how to harness that understanding in the classroom.

- “Why Do Students Remember Everything That’s on Television and Forget Everything I Say?” go.aft.org/hbu
- “How Can Educators Teach Critical Thinking?” go.aft.org/3su
- “How to Read Difficult Books: A Guide for High School and College Students” go.aft.org/4pj
- “Is It True That Some People Just Can’t Do Math?” go.aft.org/x20

—EDITORS

Supporting English Learners in General Education Classrooms

With the Trump administration's attacks on immigrants and refugees—and especially with Trump rescinding the policy that protected schools and other sensitive locations from raids by Immigration and Customs Enforcement (ICE)—it's all the more important to ensure that students who are learning English feel safe and welcome in school. In the fall issue, elementary school teacher Kathryn Zamarrón shared how she and the Chicago Teachers Union are doing all they can to protect students and their families from ICE (see go.aft.org/9hp). Here, one of the nation's leading researchers on English language development shares evidence-based strategies for ensuring that English learners are supported as they learn both a new language and grade-level content. For more resources for educators, school districts, and families, go to aft.org/our-community/immigration.

—EDITORS



By Diane August

During the 2024–25 school year, Ms. Carter took pride in creating engaging, structured lessons for her fourth-grade students. With three years of experience, she felt confident in her ability to support learners with varying needs. However, this year has been different.

After moving to a new school, her classroom now includes students struggling with reading. Some students have not acquired foundational reading skills, such as decoding, while others have struggled to comprehend texts at the fourth-grade level.

A colleague reassured her, saying, “Just stick to what works for all kids.” However, Ms. Carter soon realized these strategies were not sufficient for all of her students. While some students seemed to thrive, others struggled to read grade-level text. Those who were struggling included English learners because, on average, it can take these students three to five years to acquire oral English proficiency (everyday spoken language) and four to seven years to acquire academic language (language needed for grade-level schoolwork, such as reading and writing).¹ She questioned how to

bridge the gap between evidence-based practices that had worked for most of her students and the unique needs of her English learners because the “gap” between English learners and native English speakers tends to widen over time if English learners are not given sufficient support.

...

The challenges Ms. Carter faces are all too common. Many student groups are not doing well in reading, as the most recent National Assessment of Educational Progress (NAEP) indicates. Results from the 2024 reading assessment indicate that 40 percent of fourth-graders nationally were below the NAEP basic level, as were 72 percent of fourth-graders with disabilities and 71 percent of fourth-graders acquiring English as a second language.² Nationwide, there has been an increase in the number of English learners integrated into general education classrooms for most of the day. Between fall 2011 and 2021, the number of English learners in US public schools increased from approximately 4.6 million to 5.3 million, rising from 9.4 to 10.6 percent of the total student population.³

Federal laws and policies mandate that English learners receive appropriate support to ensure meaningful participation in educational programs.⁴ This article focuses on methods for helping classroom teachers like Ms. Carter provide that support.

Diane August is a co-principal investigator of the Center for the Success of English Learners and a research professor at the University of Houston. She brings 40 years of experience in the many aspects of educating multilingual learners. Her expertise includes policy, research, and technical assistance in educating preschool and school-age multilingual learners.

It does not directly address foundational reading skills such as phonological awareness or instructional approaches like phonics; instead, it focuses on supporting students' comprehension and oral and written expression.

Effectively teaching English learners to read in English rests on two principles, the first of which is described quickly here and the second of which is described in detail throughout the remainder of this article. As Ms. Carter knows, the first principle is using evidence-based practices for all students. This is especially important because most English learners spend the better part of their day in general education classrooms, and these methods support teachers in addressing the needs of all students, including English learners.

Reviewing these general evidence-based practices is beyond the scope of this article; however, readers seeking more information can refer to the What Works Clearinghouse Practice Guides, which are free resources available to educators and policymakers. To create the guides, panels of experts considered rigorous studies of instructional interventions. The guides provide evidence-based strategies to improve teaching and learning, practical recommendations, and suggestions for implementing these practices in real-world classrooms. Readers may want to review the guides for: developing foundational reading skills to support comprehension in students in grades K–3 (go.aft.org/jp6); improving reading comprehension in students in grades K–3 (go.aft.org/lxl); increasing elementary students' writing achievement (go.aft.org/kob); and supporting struggling students in grades K–2 (go.aft.org/9lo) and grades 4–9 (go.aft.org/c6e).*

The expert panelists associated with these guides maintain that the recommendations are appropriate for English learners and other students with special needs when accompanied by appropriate modifications. That brings us to the second principle, which is the focus of the article: providing additional and differentiated support for English learners.

Providing Additional and Differentiated Support for English Learners

Although the research on supporting English learners is not as extensive as that on English-proficient students, we have a solid foundation to help teachers like Ms. Carter develop new instructional approaches. Seven research-based recommendations model the most critical practices for general education teachers:†

1. Collect information on students' language, literacy, and content-area knowledge and skills at the beginning of the school year.
2. Provide high-quality vocabulary instruction.
3. Develop students' background knowledge.
4. Scaffold text using visual supports.

*Upon publication of this article in December 2025, these practice guides were still online. Given the Trump administration's cuts to the US Department of Education and to education grants, AFT staff downloaded these guides to ensure that they remain available. If they are taken offline, email ae@aft.org to request copies.

†For details beyond those shared in this article, readers should see two more What Works Clearinghouse Practice Guides—*Effective Literacy and English Language Instruction for English Learners in the Elementary Grades* (go.aft.org/kt7) and *Teaching Academic Content and Literacy to English Learners in Elementary and Middle School* (go.aft.org/md7)—and a very detailed report from the National Academies (go.aft.org/l0c).

Assessing first language and literacy skills helps differentiate between second language acquisition needs and learning disabilities.

5. Support close reading of text.
6. Provide writing opportunities to solidify student learning and help students become effective writers.
7. Monitor and support student progress throughout the year with formative assessment.

1. Collect Information on Students' Language, Literacy, and Content-Area Knowledge and Skills at the Beginning of the School Year

Ms. Carter knows how important it is for teachers to collect information about students' language and literacy levels and content-area knowledge at the beginning of the school year. In addition to assessing students' progress in English, as much as possible she assesses the first language and literacy skills of English learners who have been instructed in their first language. She uses this information to:

- Design appropriate instruction. Knowing her students' English proficiency and literacy levels helps Ms. Carter tailor instruction to make content accessible.⁵
- Build on students' strengths, since language proficiency and academic knowledge in students' home language(s) can transfer across to English* with the right supports.⁶
- Identify students needing additional services (such as reading interventions, support for language impairments, or language development support) and differentiate between second language acquisition needs and learning disabilities.⁷
- Comply with federal and state policies, such as the Every Student Succeeds Act, that require the assessment of English proficiency to place English learners appropriately and provide the services to which they are entitled.⁸

*The same applies to students learning second languages other than English.

ELITE Exhibits

The exhibits throughout this article are based on a handbook developed for Project ELITE (Expanding Literacy Instruction by Tutoring English Learners), a professional learning course designed by D. August and Associates Inc. and the AFT. Through intensive training courses, educators and tutors learn how to apply the ELITE model's evidence-based strategies to help students in first through eighth grades develop independent word-learning skills, build background knowledge, and enhance reading comprehension and writing to sources.

For more information, contact Giselle Lundy-Ponce in the AFT's Educational Issues Department: glundypo@aft.org.

2. Provide High-Quality Vocabulary Instruction

One of the things Ms. Carter noticed early in the school year was that her English learners didn't have the academic vocabulary they needed in English to understand her lessons fully. She found that pre-teaching essential content words helped, but she sensed that she could be doing more.

Ms. Carter's instincts were right; vocabulary is critical, and there are effective methods for teaching general academic vocabulary as well as discipline-specific vocabulary—both of which are important. General academic vocabulary are words that are not tied to a specific subject but are commonly used across many texts (e.g., *analyze*, *compare*), while discipline-specific vocabulary belong to a particular subject area or field of study (e.g., *photosynthesis*). These methods can be used in general education classrooms, classrooms designated for English learners, small-group instruction, and individual tutoring sessions. Let's see how Ms. Carter applies these methods as she supports her students in comprehending and writing about informational text—in this case, “Ellen Ochoa Makes History” (see below).

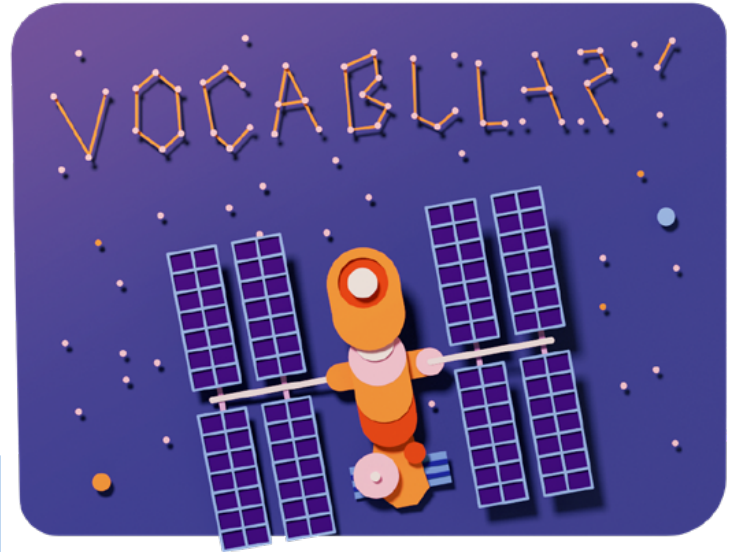
Selecting Vocabulary

Reviewing this text on Dr. Ochoa, Ms. Carter sees so much vocabulary her English learners do not know. She narrows down what to teach by using three criteria: how frequently words appear in general texts; how important words are for understanding this text; and each word's conceptual complexity (abstractness). She knows

it is ideal to consider all three factors in selecting vocabulary, but she gives priority to words that help students understand the text. She also knows it is important to consider student-level factors, like each student's level of English proficiency and background knowledge, so she refers to the information she gathered about her students at the beginning of the school year.

Frequency: English learners' reading comprehension may be compromised because they do not know common English words that English-proficient students will likely have acquired. Ms. Carter used the AIR Word Analyzer (vocabularytool.airprojects.org)* to determine the frequency of the words in the first para-

*Another tool that can be used to find frequent words in text is WordSift.org.



Ellen Ochoa Makes History

Ellen Ochoa was born in Los Angeles, California, on May 10, 1958, and grew up in La Mesa, California. She graduated from Grossmont High School in El Cajon, California, in 1975. In 1980, she graduated with a bachelor of science in physics from San Diego State University. Then, she studied electrical engineering at Stanford University. By 1985, she had earned a master's and a doctoral degree. In 1988, Dr. Ochoa started working as a research engineer for NASA (the National Aeronautics and Space Administration). In 1990, NASA chose Dr. Ochoa to become an astronaut. Three years later, she made history by becoming the first Hispanic female astronaut to go on a mission to space!

Advancing Science

Dr. Ochoa has been to space four times. Her first two missions were on space shuttles that orbited Earth. During these missions, she and the other astronauts collected scientific information. The astronauts checked how much sunlight reaches Earth and measured gases in Earth's atmosphere, such as ozone (O₃), which protects everything that lives on Earth from harmful solar rays. This helped the astronauts understand climate change. Climate change

has caused Earth to become warmer.

Dr. Ochoa's third and fourth missions were to the International Space Station. The International Space Station is a large spacecraft. It is 356 feet long and orbits Earth sixteen times every day. The space station is where astronauts from different countries live and work in space. Dr. Ochoa and other scientists from many countries worked together in space to build the station. People have lived and worked on the International Space Station since 2000. On the space station, astronauts do many scientific experiments to learn more about space, such as how plants grow and how the human body changes in space. Sometimes, astronauts leave the station for a spacewalk.

Succeeding in Four Unique Missions

Dr. Ochoa's first flight to space was on the space shuttle *Discovery*, which launched from Kennedy Space Center in Florida on April 8, 1993. Dr. Ochoa and four other crew members traveled into space to learn more about the effects of the Sun's energy on Earth's atmosphere. Dr. Ochoa also made a little time to have fun playing the flute. After nine days

in space, *Discovery* landed safely in Florida.

Dr. Ochoa went to space for a second time in 1994 onboard the space shuttle *Atlantis*. She used a robotic arm on the outside of the space shuttle to release a small satellite into space. The satellite collected information about Earth's atmosphere. After ten days in space, *Atlantis* landed safely in California.

On her third mission, on the *Discovery* in 1999, Dr. Ochoa visited the International Space Station. It was the first time a shuttle had docked at the International Space Station. Dr. Ochoa brought supplies and helped set up laboratories in the space station. She spent nearly ten days in space and traveled over 3.8 million miles!

On her fourth mission, on the *Atlantis* in 2002, Dr. Ochoa installed new equipment on the International Space Station that helps astronauts move during spacewalks. This final mission took eleven days; by the end, she had spent nearly 1,000 hours in orbit.

In 2013, eleven years after her final mission, she became the director of NASA's Johnson Space Center, making history again as the first Hispanic person to lead the center. And in 2015, she was awarded NASA's highest honor, the Distinguished Service Medal.

graph of the text about Dr. Ochoa. After she copied and pasted the paragraph into the Word Analyzer, it sorted words into quartiles based on the First 4,000 Words list. These 4,000 most frequent English words account for about 80 percent of words that readers encounter in general texts.⁹ This helped Ms. Carter select frequently used words to teach.

Importance for understanding the text: Students need to learn words central to comprehending the text they are reading or listening to. Ms. Carter identifies these words by determining the words that are needed to answer important questions about the text. In this case, she selects words that were also identified by the Word Analyzer—but with other texts, there could be words essential for understanding the text that do not appear on the First 4,000 Words list. Four words in the first paragraph of the text about Dr. Ochoa that are frequent and also important for understanding the text are *astronaut*, *graduated*, *mission*, and *space*. Ms. Carter realizes that the word *space* may be challenging for English learners because it has multiple meanings. A student might know one meaning (an empty area, like space in the closet) but not the meaning relevant to this passage (the area that contains the entire universe beyond Earth).

Conceptual complexity: Conceptually complex words are more difficult for students to learn without instruction because their meanings are less concrete and less likely to yield a mental image (e.g., *throughout*). Some of these words require students to have additional knowledge to understand them (e.g., *space*). Conceptually complex words can be taught using comprehensible definitions from wordsmyth.net (which offers beginner, intermediate, and advanced definitions), which Ms. Carter did for the words *engineer* and *space*. Such words can also be taught with visual aids such as labeled illustrations and multimedia clips, examples, analogies, and comparisons to more concrete things. (See Exhibit 1 below.)

Instructing Vocabulary

Multiple strategies can clarify the meaning of vocabulary in text or oral discourse. Ms. Carter uses many of these strategies. She previews key vocabulary, defines challenging words in context and the margins, provides labeled illustrations, and supplies bilingual glossaries. She also uses activities to reinforce the meanings of target words and teach her students word-learning strategies.

Knowing that many essential words in this text will be challenging for English learners, Ms. Carter uses picture cards or slides to preview

Exhibit 1: Select vocabulary words based on frequency, importance for understanding the text, and complexity

Excerpt from “Ellen Ochoa Makes History”: Ellen Ochoa’s Education and Early Work

Ellen Ochoa was born in Los Angeles, California, on May 10, 1958, and grew up in La Mesa, California. She graduated from Grossmont High School in El Cajon, California, in 1975. In 1980, she graduated with a bachelor of science in physics from San Diego State University. Then, she studied electrical engineering at Stanford University. By 1985, she had earned a master’s and a doctoral degree. In 1988, Dr. Ochoa started working as a research engineer for NASA (the National Aeronautics and Space Administration). In 1990, NASA chose Dr. Ochoa to become an astronaut. Three years later, she made history by becoming the first Hispanic female astronaut to go on a mission to space!

Frequency:

Use the AIR Word Analyzer to analyze word frequency (vocabularytool.airprojects.org). All the words in the table are frequent in text (i.e., they appear on the First 4,000 Words list). Quartile 1 means these words are the most frequent in text (except for the 100 most common words, like *the* and *a*, which the Word Analyzer identifies separately).

Quartile 1	Quartile 2	Quartile 3	Quartile 4
become, becoming, born, go, grew, high, history, later, national, research, school, science, space, started, state, studied, three, working, years	administration, chose, degree, earned, electrical, female, university	engineer, engineering, mission	astronaut, graduated, physics

Importance for Understanding the Text:

Four words have been selected because they are also important for understanding the text.

astronaut	graduated	mission	space
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Conceptual Complexity:

These words have been selected because they are conceptually complex.

Word	Explanation
engineer	Requires background information to understand the meaning in the context of NASA
space	Requires additional context to understand

Developing English learners' background knowledge and capitalizing on their prior knowledge support learning.

vocabulary words and phrases that are conceptually complex and important for understanding the text. (See Exhibit 2 below.)

To preview vocabulary using picture cards or slides, she uses visuals such as photos or illustrations to clarify the word's meaning and capture the students' attention. She labels the visuals and, in some cases, important parts of the visuals. She provides a comprehensible definition corresponding to the word's use in the target text. Since many students speak the same home language, she translates the word and definition into their home language(s). She asks students if the word shares cognate status with their home language (if applicable). Then she asks the students to spell the word, read a sentence from the text that used

it, and work with partners to answer a question requiring them to use the target word. With labeled visuals, definitions, a translation, the partner talk activity, and more, Ms. Carter's picture cards or slides allow students to begin to learn the meanings of conceptually complex words or words central to understanding the text before encountering them in the text.

Ms. Carter uses two additional methods to clarify the meanings of words that are important for understanding the text: defining words within the text and providing definitions in the margins. Defining words in the text refers to defining words or phrases at the point where they are encountered in the text. The definitions are inserted orally or in writing (as Ms. Carter did) and provide the meanings of the words or phrases in the text. When possible, Ms. Carter uses definitions that can easily be swapped into the passage.

Defining in the margins refers to providing concise definitions for unfamiliar words and phrases that are generally more complex than words that are defined at the point when they appear in the text. These margin definitions provide information that corresponds to the words' or phrases' meanings in the text.


With this in mind, for many other words and phrases that her English learners might struggle with, Ms. Carter types a new version of the text with definitions of words and phrases in context or the margins. (See Exhibit 3 on page 37.) As an alternative to typing a new version of the text, she could have created notes for

Exhibit 2: Preview important words using picture cards or slides

Excerpt from "Ellen Ochoa Makes History": First Two Missions to Space

Dr. Ochoa has been to space four times. Her first two missions were on space shuttles that orbited Earth. During these missions, she and the other astronauts collected scientific information. The astronauts checked how much sunlight reaches Earth and measured gases in Earth's atmosphere, such as ozone (O₃), which protects everything that lives on Earth from harmful solar rays. This helped the astronauts understand climate change. Climate change has caused Earth to become warmer.

Choose a word or phrase and create a picture card: Space shuttle

<p>space shuttle transbordador espacial</p>  <p>JEAN BEAUFORT</p>	<table> <tr> <td data-bbox="670 1234 837 1659">Definitions</td><td data-bbox="837 1234 1487 1659"> <p>A space shuttle is a special <u>vehicle</u> used to carry astronauts and <u>equipment</u> to space. It has big <u>rockets</u> to help it launch into space and wings to help it glide back to Earth like an airplane. The space shuttle program ended in 2011.</p> <p>A vehicle is something used to carry people or things from one place to another. Types of vehicles include cars, buses, trains, and spaceships.</p> <p>Equipment means the tools, machines, or supplies needed to do a job or activity. For example, astronauts need special equipment like space suits and helmets to work in space.</p> <p>Rockets are strong machines that push spacecraft or other objects into the air or space by shooting out hot gases very fast.</p> </td></tr> <tr> <td data-bbox="670 1659 837 1764">Picture Connection</td><td data-bbox="837 1659 1487 1764">This picture shows a space shuttle orbiting Earth (moving in a circle around Earth). The space shuttle's top is off so we can see the inside.</td></tr> <tr> <td data-bbox="670 1764 837 1816">Translation</td><td data-bbox="837 1764 1487 1816">Space shuttle in Spanish is <i>transbordador espacial</i>.</td></tr> <tr> <td data-bbox="670 1816 837 1879">Spelling</td><td data-bbox="837 1816 1487 1879">Space shuttle is spelled: S, p, a, c, e s, h, u, t, t, l, e</td></tr> <tr> <td data-bbox="670 1879 837 1950">Story Connection</td><td data-bbox="837 1879 1487 1950">Dr. Ochoa traveled on a space shuttle during her first two trips to space.</td></tr> </table>	Definitions	<p>A space shuttle is a special <u>vehicle</u> used to carry astronauts and <u>equipment</u> to space. It has big <u>rockets</u> to help it launch into space and wings to help it glide back to Earth like an airplane. The space shuttle program ended in 2011.</p> <p>A vehicle is something used to carry people or things from one place to another. Types of vehicles include cars, buses, trains, and spaceships.</p> <p>Equipment means the tools, machines, or supplies needed to do a job or activity. For example, astronauts need special equipment like space suits and helmets to work in space.</p> <p>Rockets are strong machines that push spacecraft or other objects into the air or space by shooting out hot gases very fast.</p>	Picture Connection	This picture shows a space shuttle orbiting Earth (moving in a circle around Earth). The space shuttle's top is off so we can see the inside.	Translation	Space shuttle in Spanish is <i>transbordador espacial</i> .	Spelling	Space shuttle is spelled: S, p, a, c, e s, h, u, t, t, l, e	Story Connection	Dr. Ochoa traveled on a space shuttle during her first two trips to space.
Definitions	<p>A space shuttle is a special <u>vehicle</u> used to carry astronauts and <u>equipment</u> to space. It has big <u>rockets</u> to help it launch into space and wings to help it glide back to Earth like an airplane. The space shuttle program ended in 2011.</p> <p>A vehicle is something used to carry people or things from one place to another. Types of vehicles include cars, buses, trains, and spaceships.</p> <p>Equipment means the tools, machines, or supplies needed to do a job or activity. For example, astronauts need special equipment like space suits and helmets to work in space.</p> <p>Rockets are strong machines that push spacecraft or other objects into the air or space by shooting out hot gases very fast.</p>										
Picture Connection	This picture shows a space shuttle orbiting Earth (moving in a circle around Earth). The space shuttle's top is off so we can see the inside.										
Translation	Space shuttle in Spanish is <i>transbordador espacial</i> .										
Spelling	Space shuttle is spelled: S, p, a, c, e s, h, u, t, t, l, e										
Story Connection	Dr. Ochoa traveled on a space shuttle during her first two trips to space.										
<p>Partner Talk:</p> <p>Would you like to travel on a space shuttle? Why or why not?</p> <p>Sentence frame:</p> <p>I _____ [would/would not] like to travel on a space shuttle because ...</p>											

herself with target words she underlined in her version of the text with definitions that could easily be swapped in to define the challenging words or phrases. For example, for “orbited Earth,” she could note “(traveled around Earth).” These definitions still require some English proficiency, but they are more accessible than the academic vocabulary in the text.

To further support English learners, and for words that Ms. Carter wanted her English learners to refer to while reading or studying, she creates a bilingual glossary to build on English learners’ prior knowledge in their first language. Beyond bilingual definitions in the glossaries, she adds space for students to rewrite the words, provides examples from the passage, and flags cognates. (See Exhibit 4 below.)

Studies suggest that the number of repetitions needed to learn a word is about 10–15 on average, with some estimates suggesting up to 17 exposures. However, what is crucial is not just how often learners see a word, but how much cognitive effort they put into processing a new word’s meaning and how conceptually complex the word is.¹⁰ Other factors include the importance of providing visual support, definitional and contextual information, encounters in multiple contexts, and learner variables such as age and levels of vocabulary knowledge. So, in addition to her many strategies to help students understand new vocabulary, Ms. Carter uses several methods to provide multiple exposures. Her methods include vocabulary quizzes, crossword puzzles, and games.

Exhibit 3: Define words in context and in the margins

Excerpt from “Ellen Ochoa Makes History”: First Two Missions to Space

Dr. Ochoa has been to **space** four times. Her first two **missions** were on space shuttles (*vehicles that carry people and equipment into space*) that orbited Earth (*traveled around Earth*). During these **missions**, she and the other **astronauts** collected **scientific information**. The astronauts checked how much sunlight reaches (*gets to*) Earth and measured gases (*air-like materials*) in Earth’s atmosphere (*layers of air around the Earth*), such as **ozone** (O₃), which protects everything that lives on Earth from harmful solar rays. This helped the astronauts understand climate change (*how the air and weather around Earth are changing*). Climate change has caused Earth to become warmer.

- space:** the place outside Earth’s atmosphere where there are stars, a moon, and planets
- missions:** trips into space to do a special job or research
- astronauts:** people trained to travel and work in space
- scientific information:** facts and ideas we learn through experiments, observations, and studying the world around us
- ozone:** a gas in the air that keeps us safe from too much sunlight



This is a picture of solar rays.

Exhibit 4: Create a bilingual student glossary

Excerpt from “Ellen Ochoa Makes History”: First Two Missions to Space

Dr. Ochoa has been to space four times. Her first two missions were on space shuttles that orbited Earth. During these missions, she and the other astronauts collected scientific information. The astronauts checked how much sunlight reaches Earth and measured gases in Earth’s atmosphere, such as ozone (O₃), which protects everything that lives on Earth from harmful solar rays. This helped the astronauts understand climate change. Climate change has caused Earth to become warmer.

Select three words for instruction and create three rows of a student glossary.

Word(s)/Translation	Rewrite the Word(s)	Definition	Example Based on Text	Cognate?
Climate change <i>Cambio climático</i>	Climate change	How the air around Earth is changing	Earth has become warmer because of <u>climate change</u> .	Yes, the word <i>climate</i> is a cognate.
Orbit <i>Orbital</i>	Orbit	When something in space moves around in a circular path	The space station and the moon <u>orbit</u> Earth.	Yes, the word <i>orbit</i> is a cognate.
Scientific information <i>Información científica</i>	Scientific information	Facts and ideas we learn by doing experiments, making observations, and studying the world around us	Ellen Ochoa collected <u>scientific information</u> on her first two missions.	Yes, the words <i>scientific</i> and <i>information</i> are cognates.

One game her students really enjoy is similar to Chutes and Ladders. (See Exhibit 5 below.) Students are divided into small groups, with each group then divided into two teams. One team picks a vocabulary card (that has both a vocabulary word and its definition) and reads aloud the definition. If the other team correctly provides the associated vocabulary word, it rolls a die and moves accordingly on the board. If it can't provide the word, the team holding the card does so. Either way, the team that just read the definition now takes a turn. The team that reaches the end of the board first wins. (Digital platforms for creating games, like Blooket and Kahoot, can also be used to reinforce vocabulary learning.)

Because it is not feasible to directly teach students all of the words they need to know to be successful readers, Ms. Carter also teaches students to use word-learning strategies to figure out word meanings. Ms. Carter uses two games to teach her students common prefixes and suffixes to figure out word meanings:

- **Word Building Relay:** Write base words, prefixes, and suffixes on separate cards. Ensure students know the meanings of the prefixes and suffixes. Divide the group or class into teams. Each team races to combine the cards to form and define valid words. The team with the most correctly formed words within a set time, such as five minutes, wins.
- **Story Building Game:** Have students work in pairs to create a story. Each student contributes sentences using words with prefixes or suffixes. Encourage them to explain the meanings of the words they use.

For students who speak a language that shares cognate status with English, a word learning strategy is to teach them to

bootstrap on their home language to figure out the meanings of English words. It is important to explain that there are false cognates—words that are spelled similarly in two languages but do not mean the same thing. For example, *éxito* in Spanish does not mean “exit”; it means “success.”

Another strategy is to teach students to use reference materials to look up the meanings of unfamiliar words. Reference materials include bilingual dictionaries, translation platforms (e.g., Google Translate, DeepL), and text-to-speech platforms (e.g., Microsoft Immersive Reader).

3. Develop Students' Background Knowledge

Across all ages and levels of ability, reading comprehension depends on the reader having relevant background knowledge and having the ability to integrate that knowledge with new information in the text. English learners may not have acquired the background knowledge needed to understand specialized content for a variety of reasons, including (1) a lack of proficiency in the language of instruction, (2) arrival in US schools after the content was instructed, and/or (3) interrupted formal education in their home country or in the United States. Developing English learners' background knowledge—which may include cultural, historical, chronological, scientific, or spatial information—that is relevant to current coursework and capitalizing on students' prior knowledge support learning.

With this text on Dr. Ochoa, Ms. Carter suspects that her English learners, and possibly many of her English-proficient students, will not have enough background knowledge about astronauts. So, before they attempt to read about Dr. Ochoa, she

Exhibit 5: Reinforce word meanings

“Ellen Ochoa Makes History” Vocabulary Board Game

people trained to travel
and work in space

astronauts

travel around Earth

orbit

a special kind of vehicle
that is used to carry
astronauts and
equipment to space

space shuttle



wants to introduce them to what astronauts do.

It is important to first identify the relevant background information. Ms. Carter looks online, but she cannot find a single source that provides all the key information her students will need. So, she creates a text by drawing from multiple sources.* She intentionally keeps the background passage succinct and ensures it does not summarize the main text about Dr. Ochoa because


the point is for students to use the background knowledge and other instructional supports to understand the text. (See Exhibit 6 below.)

It is also important to adapt the background information. When she shares this background text with her students, Ms. Carter scaffolds it with visual and linguistic supports, focusing on important terms and concepts (e.g., *gravity*, *rockets*, and *spacecraft*) that students might not know. She also provides visuals and checks for understanding by asking comprehension questions related to the background text and provides sentence starters or frames to help students who need additional support.

*While Ms. Carter uses text and a photo in this example, for other passages teachers may find that it's best to share a variety of sources with students, such as auxiliary texts, video clips, illustrations, tables, graphs, and/or maps.

Exhibit 6: Provide a scaffolded background passage

Write a brief background passage and three comprehension questions. Define words in the margins that English learners may not know and that are important for understanding the text. Add a visual support and sentence frames or starters for students who need help answering the questions.

Background Passage: "Learning About Astronauts"	Visual Support
<p>In the text, Ellen Ochoa is an astronaut who travels to space. Let's learn a little bit about astronauts.</p> <p>Astronauts are people who are specially trained to travel to space. Some astronauts studied science or math in college, and some are pilots with experience flying planes. All astronauts participate in a training program to learn how to work in space.</p> <p>Traveling to the International Space Station is an exciting and <u>challenging journey</u>. The International Space Station is a large spacecraft where astronauts from different countries live and work in space.</p> <p>Astronauts ride in a <u>spacecraft</u> that blasts off from Earth with powerful <u>rockets</u>. As they fly higher, they feel a strong push, but after a few minutes, the ride becomes smooth. There is very little <u>gravity</u> in space, so astronauts <u>float</u> inside the spacecraft.</p> <p>When they reach the space station, they carefully connect to it and move inside, where they live and work for weeks or months. The spacecraft is a difficult environment to live and work in. Everything <u>floats</u>, so they must <u>strap down</u> their food, tools, and even themselves when they sleep!</p> <p>On the International Space Station, astronauts do many <u>science experiments</u> to learn more about space and how things work without <u>gravity</u>. They study how plants grow, how the human body changes in space, and how tiny <u>germs</u> behave.</p> <p>Sometimes, astronauts leave the station for a spacewalk. They wear special suits to protect themselves from the cold and the lack of air. Moving in space is difficult because of the environment. There is no ground to push against, so they use their hands to grab onto the station or move slowly with small rocket packs. Walking in space gives astronauts an amazing view of Earth. The Earth looks like a blue and white ball <u>floating</u> far below them.</p>	<div><p>NAID: 23209213</p></div> <p>During missions to space, astronauts (like Ellen Ochoa, pictured here) spend most of their time inside a space station.</p> <div><p>Defining Words in the Margins</p><p>challenging: difficult</p><p>environment: the world around us, like the air, land, water, and living things</p><p>float: move in the air or water without touching the ground</p><p>germs: very small living things that can make people sick</p><p>gravity: an invisible force that pulls things toward each other</p><p>journey: a trip from one place to another</p><p>rockets: powerful engines that push a spacecraft into space</p><p>science experiment: a test done to answer a question or questions</p><p>spacecraft: a vehicle that travels in space</p><p>strap down: tie down something so it does not move</p></div>

Ask three comprehension questions. For students who need additional support, provide sentence starters or sentence frames.

1. What are two things some people do before they become astronauts? Two things people do before they become astronauts are ...
2. Why is traveling in space challenging (difficult)? Traveling in space is difficult because ...
3. What are two things astronauts do when they are in space? Two things that astronauts do in space are ...

4. Scaffold Text Using Visual Supports

Ms. Carter recognizes that she needs to support her English learners in developing their academic language while learning challenging new content. She has learned—and is seeing in her classroom—that visuals enhance her English learners’ comprehension and engagement,¹¹ especially with complex and unfamiliar topics or word meanings.

Visual supports are often photos, such as images of the International Space Station, but they also include gestures, illustrations, realia, multimedia (i.e., a combination of text, sound, and/or video), and graphic organizers. Many visuals are not labeled, so it is important to label them (as Ms. Carter did with the photo of the space station in Exhibit 7 below) to the extent possible.

5. Support Close Reading of Text

Ms. Carter’s picture card of a space shuttle (Exhibit 2) and other strategies to support students’ understanding of individual words helped her English learners understand the terms in selections from the text about Dr. Ochoa, as did providing background information and various visuals. However, she also wants to support all students in reading and understanding connected text, so she now focuses on close reading. Close reading involves analyzing a text by reading parts of it more than once; paying attention to details such as word choice, sentence structure, and meaning; asking and answering text-based questions; and making inferences and drawing conclusions based on evidence in the text.

Help Students Understand Compound and Complex Sentences

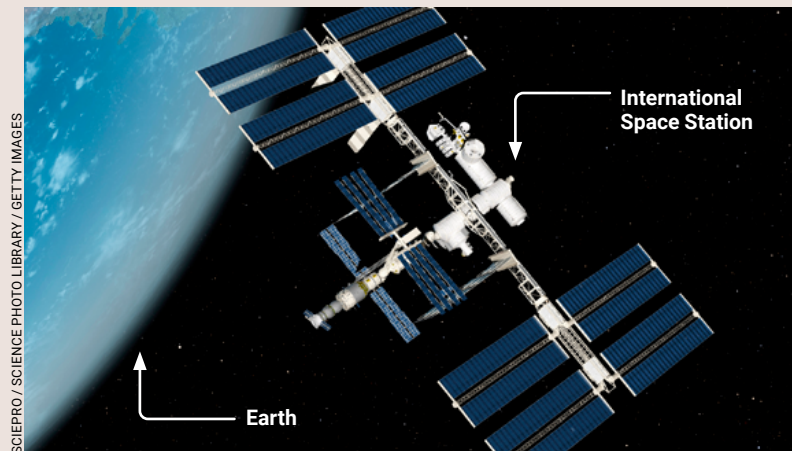
Because compound and complex sentences, as well as text with referential chains, can make text challenging to understand for many students, Ms. Carter spends time supporting her fourth-grade students in comprehending these sentence types and text with referential chains.

Compound Sentences

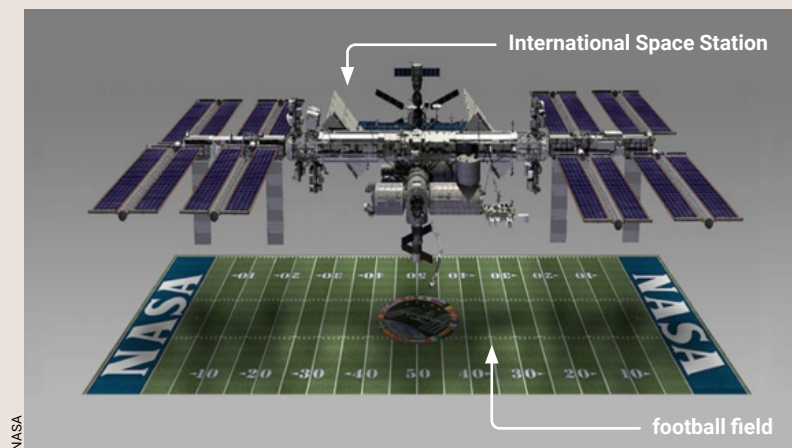
Ms. Carter starts by ensuring her students know about nouns and verbs. She explains that a *noun* is a word or words that name a person, place, thing, or idea, and a *verb* is a word or words that show action. She provides some example sentences from the text about Dr. Ochoa and asks students to identify the nouns and verbs. She then tells students that a complete sentence must have a *subject*, which is a noun (or pronoun) that performs the action and identifies who or what the sentence is about, and a *predicate*, which tells something about the subject and contains a verb. Asking students to look again at the sentences about Dr. Ochoa, she has the students pick out the subjects and predicates.

She then explains that a compound sentence is two complete sentences joined by a coordinating conjunction, such as *and*, *but*, or *so*. She provides the following example: “Ellen Ochoa was born in Los Angeles, California, on May 10, 1958, and she grew up in La Mesa, California.” Understanding compound sentences helps students understand complex sentences.

Exhibit 7: Use labeled visuals to support comprehension



You can see Earth from the space station.



The International Space Station is very big. It is the same size as a football field.

Complex Sentences

Ms. Carter follows a similar routine to help students understand complex sentences, explaining that a complex sentence is made up of at least one complete sentence (independent clause) and at least one incomplete sentence (dependent clause). She then shares one more feature of a complete sentence: In addition to a subject and a predicate, it expresses a complete thought. Incomplete sentences are missing at least one of those three components. She shows students examples of complete and incomplete sentences and asks them to work in pairs to decide which are complete sentences and which are incomplete sentences.

She tells students that in complex sentences, independent and dependent clauses are connected by words like *because*, *although*, *when*, *since*, and *if* (subordinating conjunctions). She provides the following example and indicates which part of the complex sentence is an independent clause and which part is a dependent clause: “Astronauts measured gases in the air (independent

clause or complete sentence) because they wanted to understand climate change (dependent clause or incomplete sentence).” She indicates that the two clauses are joined by the subordinating conjunction *because*.

She gives students examples of complex sentences, ensuring they are comprehensible for English learners. She asks them to work with a partner to identify the complete sentence (independent clause), the incomplete sentence (dependent clause), and the subordinating conjunction and then report what information the dependent clause provides about the independent clause.

When she encounters complex sentences in text, she asks students questions that require them to unpack their meaning. For example, with this complex sentence, “Astronauts measured gases in the air because they wanted to understand climate change,” she asks why astronauts measured gases in the air. And to help students review, she prepares a worksheet for students to write compound and complex sentences. (See Exhibit 8 below.)

Exhibit 8: Develop a worksheet to engage students in forming compound and complex sentences

Compound Sentences

As a reminder, a compound sentence is two complete sentences joined by coordinating conjunctions such as *and*, *but*, and *so*.

An example of a complete sentence is: Dr. Ochoa traveled to space four times.

Directions: Read the following paragraph and work with a partner to create two compound sentences, using words like *and*, *but*, and *so* to join complete sentences together.

Ellen Ochoa was born in Los Angeles, California, on May 10, 1958. She grew up in La Mesa, California. She graduated from Grossmont High School in El Cajon, California, in 1975. In 1980, she graduated with a bachelor of science in physics from San Diego State University. Then, she studied electrical engineering at Stanford University. By 1985, she had earned a master’s and a doctoral degree. In 1988, Dr. Ochoa started working as a research engineer for NASA (the National Aeronautics and Space Administration). In 1990, NASA chose Dr. Ochoa to become an astronaut. Three years later, she made history by becoming the first Hispanic female astronaut to go on a mission to space!

Complex Sentences

As a reminder, a complex sentence is made up of at least one complete sentence (independent clause) and at least one incomplete sentence (dependent clause) joined by subordinating conjunctions such as *because*, *although*, and *when*.

Examples of incomplete sentences are: Because Dr. Ochoa has been to space four times. Grew up in La Mesa, California.

Directions: Work with a partner to combine the two sentences below to make a complex sentence and answer the question. Use words like *because*, *although*, *when*, *since*, *after*, *before*, *if*, and *while* to connect the sentences. You do not need to use every word from the complete sentences.

1. In 1988, Dr. Ochoa began working as a research engineer at NASA. She became an astronaut in 1990. Conjunction: after

Complex Sentence: _____

Question: What did Dr. Ochoa do before she became an astronaut?

2. Dr. Ochoa traveled on the space shuttle *Discovery* on her first flight. On her second flight, she traveled on the space shuttle *Atlantis*. Conjunction: before

Complex Sentence: _____

Question: What did Dr. Ochoa do after her first flight on *Discovery*?

3. Dr. Ochoa was on board the space shuttle *Atlantis*. She used a robotic arm to release a small satellite into space. Conjunction: while

Complex Sentence: _____

Question: What did Dr. Ochoa do when she was on the space shuttle *Atlantis*?

4. Dr. Ochoa visited the International Space Station on her third mission. She brought supplies and helped set up a laboratory. Conjunction: when

Complex Sentence: _____

Question: What did Dr. Ochoa do when she was on the International Space Station?

Challenge

Write two of your own short complete sentences about space. Then combine them into a compound sentence. Write two more complete sentences about space. Then combine them into a complex sentence.

Compound Sentence: _____

Complex Sentence: _____

Scaffolding text with visual supports for unfamiliar topics and vocabulary enhances English learners' comprehension.

Help Students Understand Referential Chains

Referential chains are sequences of words or sentences in a text that all refer to the same person, place, or thing (called a *referent*). These words can include nouns, pronouns, or descriptive phrases. The sequences often use pronouns to refer to the referent, which can make it confusing for students to follow the meaning of the sentence within the referential chain.

To avoid confusion among her students, Ms. Carter has them discuss these two sentences: "Dr. Ochoa's third and fourth missions were to the International Space Station. It is 356 feet long and orbits Earth sixteen times every day." She wants to ensure that all the students understand that the word *it* is a pronoun that refers to the International Space Station. She provides other examples with different pronouns or nouns that are named differently from the referent.

Support Overall Understanding by Using Guiding and Supplemental Questions

Taking one paragraph from the passage about Dr. Ochoa, Ms. Carter writes a guiding question and three supplemental questions. She also provides English learners with differentiated scaffolding, such as sentence starters, to help them answer the questions. (See Exhibit 9 below.)

Seeing how well this worked, Ms. Carter uses these techniques for all of the text about Dr. Ochoa. After segmenting "Ellen Ochoa Makes History" into manageable chunks, she first reads out loud a guiding question focused on main ideas, themes, or events from one or two paragraphs. Next, if necessary, she reads out loud or asks students to read out loud the relevant portion of the passage. Then, students work together to answer supplemental questions about details (what, where, when, why, who, and how) to help them answer the guiding question. Ms. Carter pairs students so that, if called for, one student can support the other in answering the questions by rereading relevant portions of the passage.

She employs techniques that help students answer supplemental questions, including asking questions about details in chronological order; inquiring about word meanings that are defined in context or the margins; defining key terms that appear in the questions; restating information from the text before asking a question; and providing scaffolded support, such as sentence starters, sentence frames, and word banks.

When needed, Ms. Carter offers some of these supports in students' home languages. Typically, she offers side-by-side bilingual

Exhibit 9: Ask guiding and supplemental questions and provide support for student responses

After reading the guiding question, read the text aloud to students or ask a student or students to read it aloud. Then, ask text-dependent supplemental questions and support students with lower levels of proficiency in answering the questions. Students can work in pairs or individually to answer the questions. Debrief the students and then ask students to work in pairs to answer the guiding question and report back to the class.

Excerpt from "Ellen Ochoa Makes History": Third and Fourth Missions to Space

Dr. Ochoa's third and fourth missions were to the International Space Station. The International Space Station is a large spacecraft. It is 356 feet long and orbits Earth sixteen times every day. The space station is where astronauts from different countries live and work in space. Dr. Ochoa and other scientists from many countries worked together in space to build the station. People have lived and worked on the International Space Station since 2000. On the space station, astronauts do many scientific experiments to learn more about space, such as how plants grow and how the human body changes in space. Sometimes, astronauts leave the station for a spacewalk.

Guiding Question

What did Dr. Ochoa do on her third and fourth missions?

Supplemental Questions

1. Where did Dr. Ochoa go during her third and fourth missions (trips to space)?

Dr. Ochoa went to the _____.

2. What is the International Space Station?

The International Space Station is a large _____ that _____ the earth sixteen times each day. The International Space Station is where astronauts _____ and _____ in space.

3. What do astronauts do on the space station?

On the space station, astronauts do many _____ to learn more about ...

versions with students’ home language and English, followed by questions in both languages. When possible, she also provides related multimedia with subtitles and voice-overs (where a recorded voice narrates the film or video in the target language providing an alternative audio track alongside the original).

6. Provide Writing Opportunities to Solidify Student Learning and Help Students Become Effective Writers

Ms. Carter was thrilled with her students’ engagement and comprehension as they closely read the passage about Dr. Ochoa. They have learned a lot of new vocabulary and concepts. Writing is a great way to deepen and solidify students’ learning, so Ms. Carter wants to develop two writing exercises: expository and narrative. She comes up with writing prompts for each type of writing (see

Exhibit 10 below). The prompts clarify what students are supposed to write about and what to include in their writing. Then, since expository writing tends to be less familiar to students, she creates a framework to help them write expository text and completes it to serve as a model. This breaks each part into a manageable task (topic sentence, facts, and conclusion) and models sample responses for the topic sentence, facts, and conclusion.

While writing is a great way to solidify learning, it is also essential that students become effective writers. There is strong evidence for teaching students how to write for a variety of purposes, moderate evidence for teaching them “to become fluent with handwriting, spelling, sentence construction, typing, and word processing,” and minimal evidence for having students write daily and creating a writing community.¹² There is also

Exhibit 10: Develop writing prompts, expository and narrative text writing frames, and model answers

Create two writing prompts for different types of writing. Have students complete the expository essay first so they can draw on what they learn from the expository essay in their narrative essay.

Prompt	Type of Writing
Reread “Ellen Ochoa Makes History” and the background passage “Learning About Astronauts” (Exhibit 6), then write a paragraph that tells what you learned about the astronaut Ellen Ochoa. Give three facts that you know about Ellen Ochoa.	Expository
Pretend you are an astronaut. Write about your experience traveling to the space station and what you did when you were there. Before you write, reread the background passage “Learning About Astronauts.”	Narrative

Expository Text Writing Frame

Writing Prompt: Write a paragraph that tells what you learned about the astronaut Ellen Ochoa and her trips to space. Give three facts. Use this frame and model to help you.	
Topic Sentence Tell your reader what you are writing about.	Ellen Ochoa, who was the first Hispanic female astronaut, traveled to space four times.
Facts Give three facts about the topic. Use details to support those facts.	1. On her first two trips, Dr. Ochoa orbited Earth on space shuttles. A space shuttle is a special vehicle that carries astronauts and equipment to space. It has big rockets to help it launch into space and wings to help it glide back to Earth like an airplane. On her third and fourth missions, Dr. Ochoa went to the International Space Station. The International Space Station is a large spacecraft that orbits Earth sixteen times daily.
	2. Dr. Ochoa and the other astronauts collected information on the first two missions and conducted experiments to learn about climate change. To learn about climate change, they checked how much sunlight reaches Earth and measured gases in Earth’s atmosphere, such as ozone (O ₃), which protects everything that lives on Earth from harmful solar rays.
	3. During these trips, the astronauts did many scientific experiments to learn more about space, such as how plants grow and how the human body changes in space. Sometimes, the astronauts left the station for a spacewalk.
Conclusion Remind your reader what you are writing about, but do not repeat the topic sentence. Add a detail that tells what you think about what you read.	In conclusion, Dr. Ochoa was an astronaut who made history. On each mission, she and the other astronauts did experiments to collect scientific information. It was exciting to learn about Dr. Ochoa’s efforts to protect Earth from climate change and how she learned about space, like how plants grow in space.

evidence that consistently modeling for students—and providing opportunities for them to practice—strategies for planning, revising, and editing positively impact students’ writing.¹³

Research also demonstrates that for English learners to become effective writers, instruction should integrate oral language development with writing methods while also providing scaffolds that support language production. Oral language practices, such as oral rehearsal before writing, help students generate and organize ideas, and explicit sentence-level instruction (e.g., sentence combining and sentence expansion) strengthens syntactic knowledge needed for written expression.¹⁴ Research further underscores that scaffolds such as sentence frames, starters, and collaborative discussion—that include opportunities for English learners with entering and emerging levels of proficiency to use their home language—are important supports.¹⁵ More recent empirical work in science classrooms confirms that writing helps English learners

better master science concepts and scientific language.¹⁶ Wanting to incorporate this research into her classroom, Ms. Carter has students discuss the expository and narrative paragraphs they wrote and then supports them as they revise and edit their work.

7. Monitor and Support Student Progress Throughout the Year with Formative Assessment

Ms. Carter knows that formative assessment is essential for determining students’ reading and language proficiency levels, monitoring students’ progress, and figuring out what supports they need.¹⁷ Although her school has some formative assessment, Ms. Carter likes to supplement them with assessments she develops based on what she is teaching. She developed an exit ticket for the passage on Dr. Ochoa, using an activity in which students match vocabulary words with their definitions and respond to four questions about the space station and one question about

Exhibit 11: Develop exit tickets to assess academic language and comprehension

Exit ticket to assess students’ academic language

Assess students’ vocabulary knowledge by having them fill in the blanks with the correct vocabulary word. Provide a word bank only for students who need additional support.

Word Bank

missions space energy orbited experiments

On her first two _____ to space, Dr. Ochoa flew on space shuttles. The space shuttles _____ Earth—this means the space shuttles flew around Earth. Dr. Ochoa did science _____. She studied how the sun’s _____ affects Earth. Dr. Ochoa loved to play the flute. On her first mission, she even brought a flute with her and played it in _____!

Exit ticket to assess students’ reading comprehension

Students read the passage and answer the questions individually or with partners. Provide sentence starters only for students who need additional support.

Dr. Ochoa’s third and fourth missions were to the International Space Station. The International Space Station is a large spacecraft. It is 356 feet long and orbits Earth sixteen times every day. The space station is where astronauts from different countries live and work in space. Dr. Ochoa and other scientists from many countries worked together in space to build the station. People have lived and worked on the International Space Station since 2000. On the space station, astronauts do many scientific experiments to learn more about space, such as how plants grow and how the human body changes in space. Sometimes, astronauts leave the station for a spacewalk.

- Describe (tell about) the International Space Station.
The International Space Station is ...
- What do the astronauts do at the space station?
At the space station, astronauts ...
- What do the astronauts want to learn about?
They want to learn about ...
- What else do the astronauts do on the space station?
Sometimes the astronauts leave the space station for a _____.
- Would you like to be on the space station? Why or why not?
I would like/not like to be on the space station because ...

whether they would like to be on the space station. (See Exhibit 11 on page 44.)

Ms. Carter assigns students to pairs, reviews the answers to the exit ticket with the class by writing them on the whiteboard, and asks students to correct each other's answers. When they are turned in, she identifies students who have not done well. While those who performed well are reading independently, she puts those needing more support into a small group and reviews the passage and responses with them.

Although there have been moments when Ms. Carter felt overwhelmed as she realized just how much support her English learners need to learn English and to learn in English at the same time, she is grateful to now have so many more strategies at hand to support their needs. And, as she gets to know her colleagues at her new school, she sees that they can collaborate in using these strategies to create and share English learner supports for the content they teach. ■

For the endnotes, see aft.org/ae/winter2025-2026/august.

Using Small-Group Interventions

In some classrooms, many students struggle with reading. A key challenge with small-group instruction is how to support all struggling students while the teacher is working directly with one small group. Fortunately, there are various options.

One option is peer partnering. Teachers can partner students (ensuring that one student has the capability to support the other). Ms. Carter provides training for the peer tutors by modeling how to help their partners read difficult words, attend to punctuation, and make sense of the text.

A second option is to bring a teacher with expertise in English learners into the classroom to support a small group. Sometimes, this group can be pulled out to work with a specialist outside the classroom while the other students are in small groups or whole-group instruction during the literacy block. It is best to avoid pulling students out during other content classes since content-area vocabulary and background knowledge are essential to reading (and listening) comprehension.

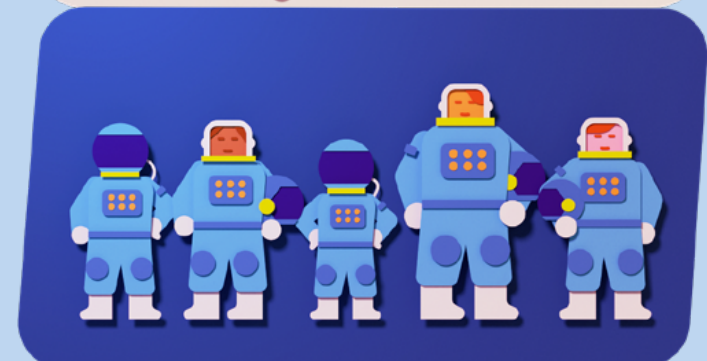
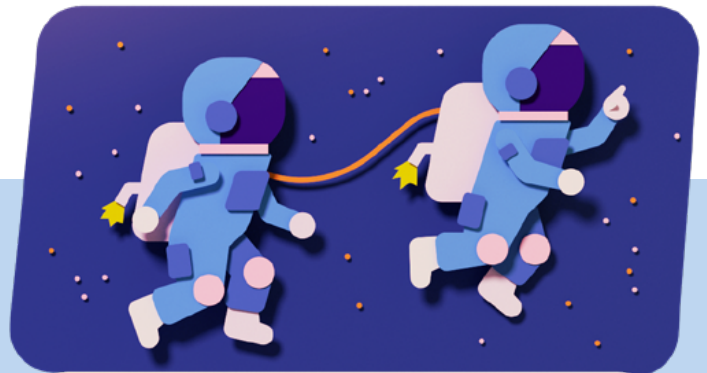
A third option is to group students based on their reading abilities, regardless of age and grade. The whole school engages in literacy at the same time each day, and all educators with relevant backgrounds (i.e., teachers, librarians, literacy coaches, special education teachers, literacy aides) support the groups. Every six to eight weeks, students are assessed and regrouped as needed. Unfortunately, there is no recent research related to this approach. The most recent study indicated that nongraded organization can positively impact student achievement if cross-age grouping allows teachers to provide more direct instruction to students.¹

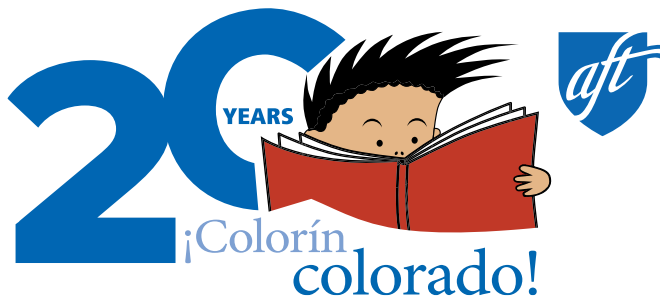
A fourth option is providing students who are not in small groups with adaptive technology that supports foundational reading skills, vocabulary, and comprehension. Although there are few experimental studies focused specifically on English learners, studies have found that technology-delivered instruction for students in grades K–5 significantly boosts literacy outcomes.²

—D. A.

For the endnotes, see aft.org/ae/winter2025-2026/august_sb.

For English learners to become effective writers, integrate oral language development with writing methods and scaffold language production.










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