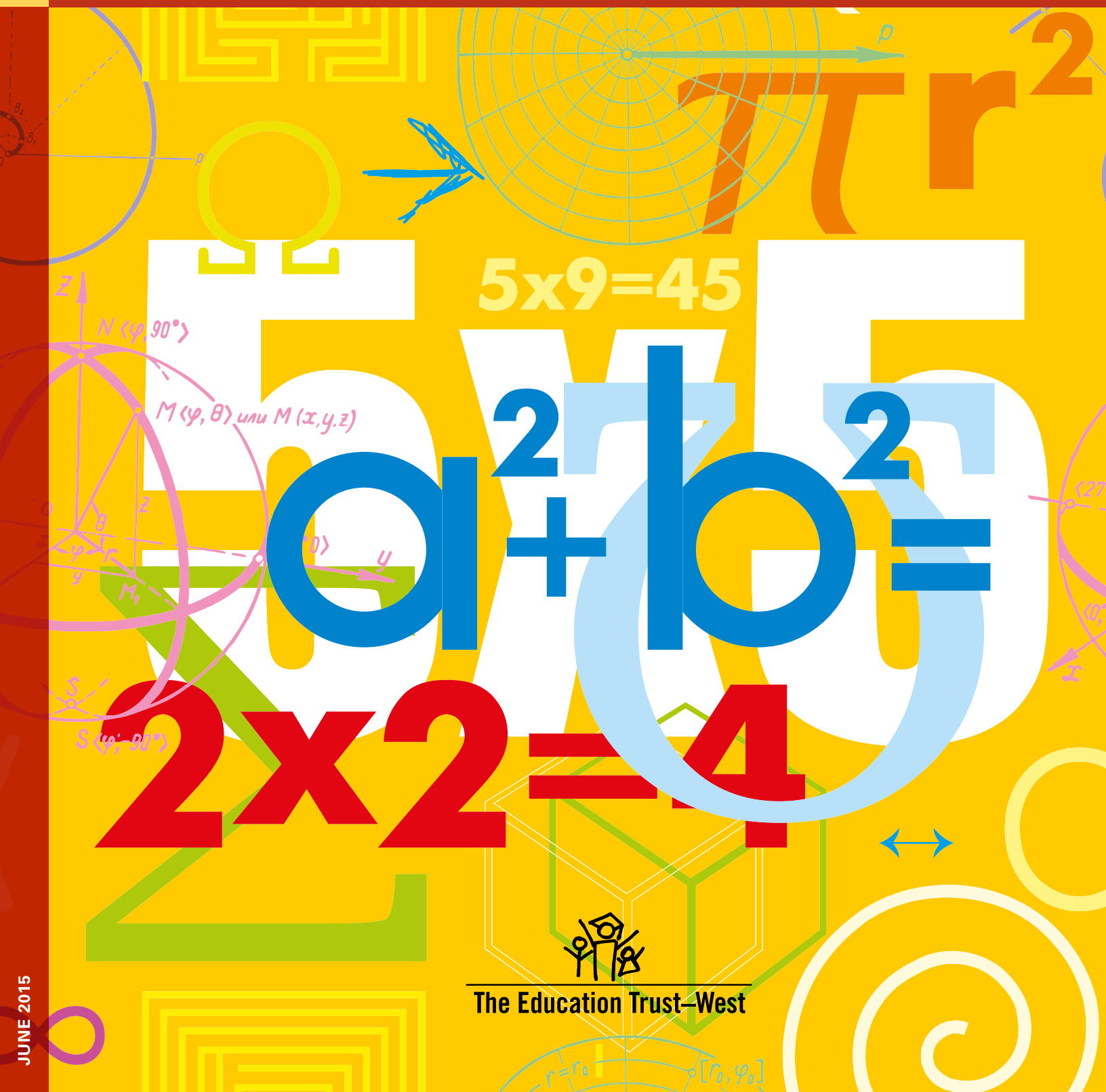
K-12 PRACTICE

CHANGING THE EQUATION:

ENSURING THE COMMON CORE MATH STANDARDS ENABLE ALL STUDENTS TO EXCEL IN CALIFORNIA SCHOOLS



The Education Trust–West

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Students and teachers in schools and districts across California, and in 42 other states and the District of Columbia, are adjusting to a new set of expectations for what it means to be successful in math and English language arts. The Common Core State Standards in math (CCSSM) and the Standards for Mathematical Practice demand more from teachers and students. These elevated expectations are especially critical for low-income students, as well as African American and Latino students, whose often limited access to effective teaching and rigorous math curricula has contributed to achievement gaps in math performance between them and their white, Asian, and upper-middle class peers.[1] The new Common Core math standards hold the promise of improving instruction in ways that will support each and every student — regardless of race or class — to graduate prepared for success in college-level math, and to be employable in the workforce, including in our state's expanding science, technology, engineering and math fields. Providing a path to math proficiency for all students is both a critical equity issue, and an economic imperative if California is to remain a leader in STEM-related industries.

The 2014–2015 school year marked the official start of CCSSM implementation in California, and the first official administration of the full battery of CCSS-aligned tests created by the Smarter Balanced Assessment Consortium.[2] Districts and schools have prepared for this transition in different ways, and many are ill-equipped for the task. Students face dire consequences when they miss opportunities to advance their learning, and students of color and low-income students, in particular, bear the brunt of underprepared teachers and schools.[3] Fifteen percent of low-income eighth-grade students in California earned proficient or better scores on the 2013 National Assessment of Educational Progress math assessment. By comparison, 45 percent of their non–economically-disadvantaged peers achieved proficiency. And 11 percent of African American and 15 percent of Latino eighth-grade students scored proficient or above on the same assessment, compared to 42 percent of white students and 61 percent of Asian students.[4] We must utilize all the tools and resources available to ensure students of color and low-income students can both access and master rigorous math knowledge, skills, and practices.

In order to realize the promise of the Common Core and close achievement gaps in math, it is vital that educators engage in coherent, coordinated efforts to implement high-quality math curriculum and instruction. And, it is critical that the California's Department of Education ensures that regional and local efforts are well-supported and sufficiently address the needs of all students — something that many districts and schools struggle to do. Teachers must hold high expectations for all students and have access to professional learning opportunities that build their pedagogical and content knowledge. Students must be provided high-quality, Common Core–aligned curricula, effective and timely supports to address different language proficiency levels

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and other identified learning needs, and demanding math courses, particularly at the high school level. Additionally, educators need to engage families in two-way conversations about the shifts in the new standards and how they can best support their child's learning at home.

In this report, The Education Trust – West shares emerging best practices from districts that are working hard to implement Common Core math in a manner that ensures low-income students and students of color have opportunities to learn relevant, coherent mathematics.

WHAT IS SO DIFFERENT ABOUT THE COMMON CORE?

The Common Core grade-by-grade math standards, and the Standards of Mathematical Practice expected at every grade level (see sidebar) together define what students should understand and be able to do. Specifically, the new standards intentionally shift away from memorization in favor of mathematical reasoning and understanding; and away from math that is disconnected from everyday use to emphasize critical thinking, student communication, and real-world applications. The new Common Core math standards encourage thoughtful questioning, collaborative problem solving, and the application of math in a variety of contexts — all of which are critical for college and career success.[5]

While this type of learning and teaching has been available to upper-income students who are expected and equipped to succeed in college, low-income students have frequently encountered low expectations and rote instruction. The Common Core recognizes that students living in poverty — like all children — can achieve at high levels when they are taught at high levels.

WHAT ARE THE STANDARDS FOR MATHEMATICAL PRACTICE?

While the Common Core State Standards outline what students should know and be able to do at a given grade level, the Standards for Mathematical Practice describe the learning behaviors all students are expected to demonstrate.

COMMON CORE STATE STANDARDS FOR MATHEMATICAL PRACTICE

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and makes use of structure.**
8. **Look for and express regularity in repeated reasoning.**

Source: http://www.corestandards.org/Math/Practice/

WHAT IS CHALLENGING ABOUT IMPLEMENTING COMMON CORE STANDARDS?

These shifts in expectations require teachers to become adept at new ways of teaching and assessing student learning. Districts across California have invested time and energy to help teachers and school leaders understand the standards, create or adapt curriculum and formative assessments, restructure their secondary math courses, and communicate these shifts to students and families.

The type, depth, and frequency of professional learning varies widely from district to district, however, and even from site to site within districts.[6] And these disparities have the potential to create worrisome gaps in students' access to high-quality, standards-aligned instruction from well-prepared teachers. Providing high-quality, meaningful professional learning opportunities for teachers is a necessary prerequisite to ensuring students have access to high-quality curriculum and instruction. Teachers need time to deeply understand the math standards in order to effectively teach math concepts that are challenging and relevant for all students and especially students who have historically struggled in math, including English learners and low-income students. Teacher learning opportunities help educators to engage students in the math content in meaningful and productive ways and to develop as mathematical thinkers. Leaders in state, county office, and district roles need to address differences in teacher capacity to mitigate inequity in quality implementation efforts.

Although the state designated roughly $200 per student to advance Common Core implementation in 2013,[7] district leaders have looked for additional funds to support CCSS implementation.[8]

In addition, the state has not generated CCSSM content or curated high-quality professional development and instructional materials the way other states have.[9] Furthermore, although the state of California released the Math Curriculum Frameworks in 2014 to support the implementation of the standards at each grade level, it is unclear how the frameworks are being used and to what extent they help to support novice or struggling teachers.

And while most new math textbooks are advertised to be "Common Core–aligned," few actually are, differing little from their previous editions.[10] In fact, of the 31 instructional programs formally adopted by the California State Board of Education in January 2014, 10 were reviewed by EdReports, and only one partially met the non-profit organization's expectations for Common Core alignment. *(See Figure 1.)*

Furthermore, teachers are challenged to teach higher standards to students who haven't had the benefit of several years of CCSSM-aligned instruction. For example, fifth-grade teachers are expected to instruct their students to fifth-grade Common Core standards, but the students' previous instruction in K–4 reflect the state's old set of standards, causing gaps in students' understanding of specific Common Core math concepts.

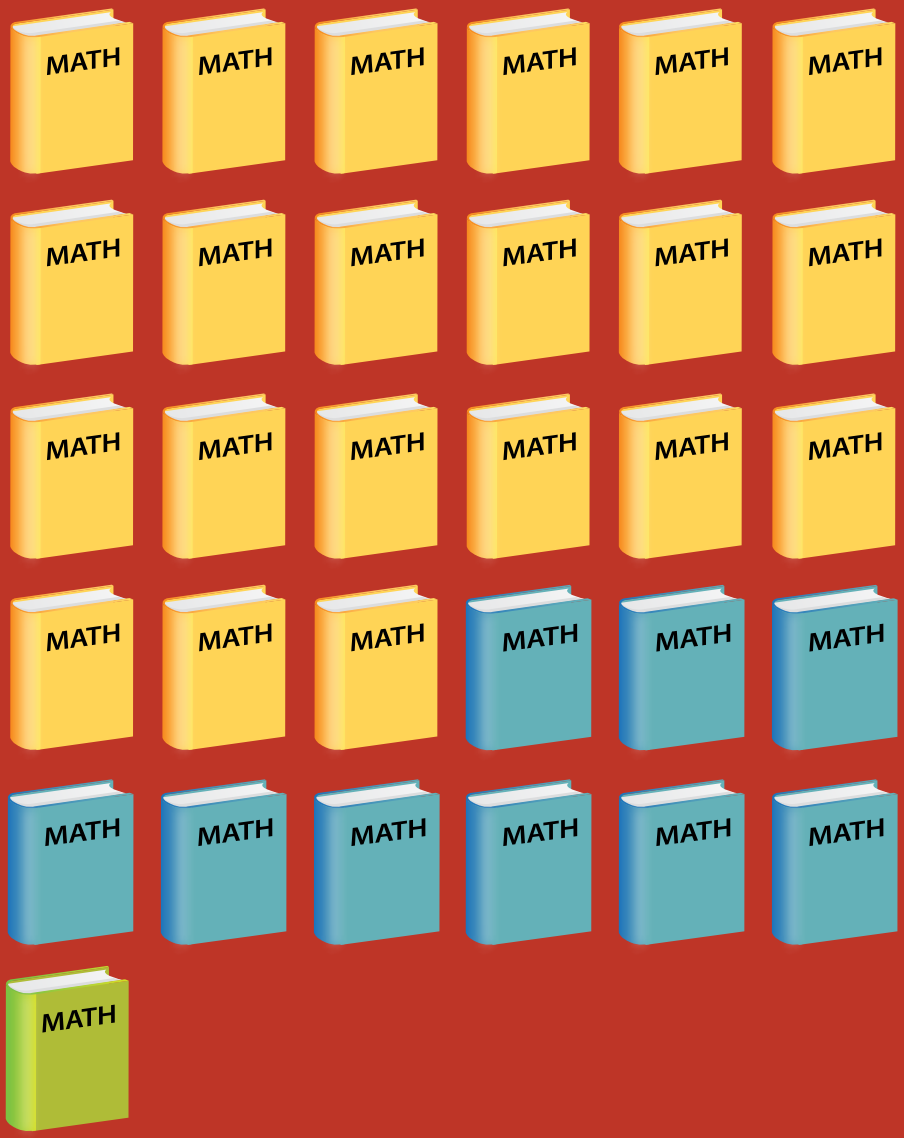
As district leaders restructure secondary math courses to reflect the Common Core Math standards, they often encounter debates about changes in both the nature and sequence of their math courses. The Common Core emphasizes building a strong foundation for algebra in the eighth grade, and ensuring that all students master algebra, geometry, and advanced algebra concepts in high school. Many experts attest that the eighth-grade math course is more rigorous than the previous Algebra I course offered in eighth-grade grade, and that the new Algebra I and Mathematics I courses are more advanced than previous similarly-named courses.[11] Nevertheless, many adults – both parents and educators – push to keep the same sequence of math courses they experienced in school, and expect higher achieving students to enroll in accelerated math courses while other students take less demanding coursework.

Finally, state and local policy makers have not yet aligned graduation requirements with the demands of the Common Core math standards. For example, California requires students to successfully complete an Algebra I course in order to graduate, but that expectation is lower than what the CCSSM standards, adopted in 2010, expect of all students. If the state does not increase the minimum course requirements for high school graduation to reflect college- and career-ready expectations, we can be sure that not all students will be equipped to meet those demands.[12]

Districts across California have invested time and energy to help teachers and school leaders understand the standards, create or adapt curriculum and formative assessments, restructure their secondary math courses, and communicate these shifts to students and families.

FIGURE 1:

CALIFORNIA K-8 APPROVED MATH INSTRUCTIONAL PROGRAM SERIES REVIEWED BY EDREPORTS.



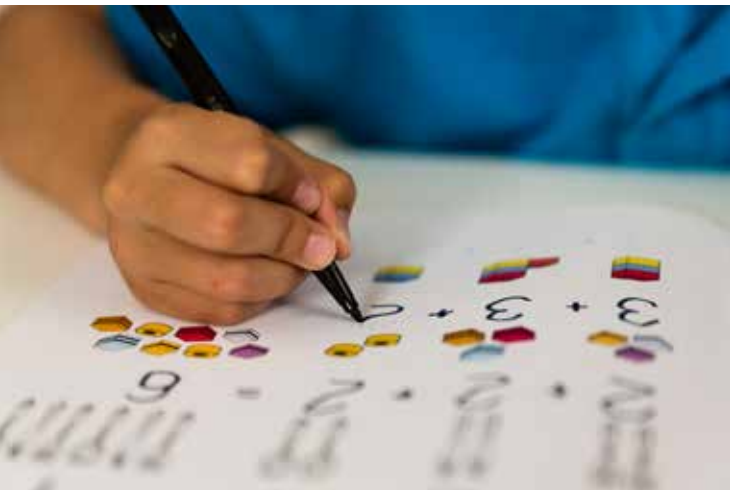
31
Math Series Books Adopted by California State Board of Education

10 out of 31
Reviewed by EdReports

9 out of 10
Did not meet expectations for CCSSM alignment

1 out of 10
Partially met expectations for CCSSM alignment

PROMISING PRACTICES FROM THE FIELD



Promising practices are emerging to give each and every student the opportunity to become mathematically proficient. We spoke with math experts, researchers, county, school and district leaders, and teachers to uncover a few promising strategies for closing math opportunity and achievement gaps.

BEST PRACTICE #1:

CREATING A CULTURE OF HIGH EXPECTATIONS FOR ALL STUDENTS

One of the greatest opportunities of the Common Core State Standards is providing a demanding and coherent set of expectations for all students to become mathematically proficient. This requires consistent access to a college preparatory sequence of math courses, effective teachers, and rigorous curricula and assessments.

A common feature of schools and districts that are closing math achievement gaps and challenging racial, ethnic, and gender stereotypes about math learners is the high expectations they hold for all students. This means that the curriculum has an appropriate amount of grade-level difficulty, and different types of students not only get access to the curriculum, but also access to supports they may need. In addition, a culture of equity and excellence permeates each school environment.

Aligning course requirements with university entrance requirements: One thing districts that model a culture of high expectations do is ensure all students are on track to graduate with the foundational mathematical skills to be successful in college and career. This includes making sure students complete the requirements to be eligible for entrance to one of California's public, four-year universities. In order to be eligible for University of California and California State Universities, students must pass a prescribed pattern of courses, called "a-g" courses approved by the University of California Office of the President.[13] Students are expected to successfully complete three years of math that include algebra and geometry. In 2013-2014 only 42 percent of all California high school graduates had completed their "a-g" requirements.[14] To address this, Tustin Unified School District in Southern California's Orange County automatically enrolls its high school students in "a-g" coursework. Students have to opt out of college-track coursework if they do not want to be enrolled in "a-g" courses. This strategy has dramatically increased the number of students in Tustin who are on track to satisfy

the math requirement for entrance to California public universities.[15]

Reducing or eliminating tracking: In addition to requiring their students to complete the "a-g" required course sequence in order to graduate,[16] San Francisco Unified School District recently eliminated honors math courses in ninth and 10th grade to counteract the practice and effects of assigning students to math courses according to perceived ability groups, commonly known as tracking.[17] African American and Latino students are dramatically under-represented in honors and Advanced Placement math courses in districts across the state,[18] which several researchers attribute to the practice of tracking.[19] In addition, the district eliminated the practice of accelerating cohorts of students into math courses beyond the established grade level in middle school and grades nine and 10 (e.g., offering 8th-grade Algebra I or 9th-grade Geometry). Students are eligible to take honors or accelerated math courses after the 10th grade.

Ensuring high expectations are reflected consistently throughout a school system: Rigorous math instruction is essential, but it is just one critical part of ensuring all students, particularly low-income students and students of color, graduate ready for college and career. For Common Core math implementation to be successful, district leaders must have a coherent strategy for aligning Common Core implementation efforts across school sites. Effective alignment strategies include engaging and implementing Common Core work across multiple content areas (e.g., developing academic language or emphasizing writing across the content areas), and ensuring the district Local Control Accountability Plan (LCAP),[20] along with other district activities, promotes students' academic success. A district LCAP should, for example, identify specific CCSSM professional development and student support activities with clear funding allocations to address identified needs and goals.

Riverside County's Corona-Norco Unified School District and San Francisco Unified School District require that all schools use the same math curriculum to ensure coherence between grades and across sites. Math coaches and teacher leaders monitor the implementation of the math curriculum, offering support to teachers and students where needed, and making adjustments when something is not working.

Aligning high school and postsecondary institution expectations: Aligning expectations for students' high school math proficiency with those of institutions of higher education is critical. When districts and universities work together to clarify what students need to know and be able to do in order to earn credit-bearing coursework, students can avoid taking remedial coursework that does not advance their academic standing.[21] In Corona-Norco for example, district leaders are streamlining the continuum between high school math courses and those offered at the local community college.

BEST PRACTICE #2:

PROVIDING ROBUST EDUCATOR SUPPORT AND CONTINUOUS LEARNING OPPORTUNITIES

Reinforcing a culture of high expectations also requires teachers who are well-versed in the new standards and are well-grounded in the content knowledge needed to bring the standards to life. Teachers who are comfortable with the shifts and learning practices outlined in the Common Core are better equipped to deliver instruction that is challenging, differentiated, and focused on what students need to know and be able to do at each grade level. As the assistant superintendent of instruction of Chula Vista Elementary School District John Nelson put it, "The shift requires both deeper understanding of content and strong pedagogical skills to be able to engage students in instructional tasks that will build their conceptual understanding."

But learning about and implementing the new standards requires meaningful professional development

To meet college admission requirements, students are expected to successfully complete three years of math that include algebra and geometry. In 2013–2014, only 42 percent of all California high school graduates had completed their "a–g" requirements.

opportunities and substantial investments of time and energy, particularly for teachers and school leaders who serve low-income students and students of color. Unfortunately, the data tell us that teachers who teach in schools with large numbers of low-income students and students of color are less experienced, demonstrate weaker content background knowledge, and have more limited access to meaningful professional learning opportunities related to the new standards than their peers in more white and affluent communities.[22] Like student learning, teacher learning is a process that requires intentional and frequent occasions for teachers to grapple with the new standards, try out lessons, observe different instructional strategies, and explore curricula and assessments. Additionally, teachers need a strong foundation in the math content they are teaching in order to reach students with different learning needs and to encourage multiple ways of solving problems.

Providing high-quality professional learning and coaching: Several school districts around the state are leading the charge to provide high-quality professional learning and coaching opportunities so teachers are prepared to serve a diverse population of learners in their classrooms.

Math Coaching Consortium

West Contra Costa Unified School District in Northern California, for example, is leading a regional Math Coaching Consortium that provides monthly professional development and technical support for math content coaches in eleven participating districts and charter systems. MCC also provides professional development for teachers through summer institutes, Saturday professional learning sessions, and after school trainings, along with weekly in-classroom support through demonstration lessons and collaborative planning. All these experiences are designed to simultaneously support teachers' math content knowledge and their use of effective instructional methods for diverse learners. Teachers learn instructional practices to develop students' mathematical thinking. The key to this, according to MCC founder Phil Gonsalves, is showing students multiple methods and approaches to solving mathematical problems in a side-by-side comparison. Early data show that students with teachers who receive formal coaching support and professional development through the MCC perform better in math on state assessments, district benchmarks, and formative assessments than those whose teachers do not have this support.

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Lesson Study

Cutler-Orosi Joint Unified School District in rural Tulare County, located in California's Central Valley, grounds its approach to teacher learning in lesson study and student work analysis. After several years of intensive Common Core professional development focused on building awareness and understanding of the standards, Cutler-Orosi teachers have turned their attention to improving the quality of their lessons.

The district has implemented a structured process for lesson studies and a district-wide focus on literacy across content areas, particularly in math. First, teams of teachers work in grade-level teams to develop math lessons, which are designed to be accessible to all students, including English learners. The next day, each teacher teaches the lesson while others observe and take notes. A math coach, who is present during the lesson, facilitates a conversation after the lesson. In that "debrief," teacher teams review student work and discuss both successful components of the lesson and aspects that could be improved. Teachers take what they learned and observed in the lesson study process to inform ongoing instruction in their own classroom. Superintendent Yolanda Valdez says this process is helping to shape "relentless, courageous instructional leaders" in each of COJUSD's schools, and the district has already seen improvements in students' math proficiency at the high school level. Decisions at the district and school levels to provide critical resources (e.g., teacher time, place to meet, facilitators, and structures) made this type of collaborative learning possible.

Teacher leaders were employed to design, pilot, and scale a curriculum. The teachers were not left to figure things out on their own. They were supported by math experts who crafted yearlong professional development and a math teacher toolkit.

BEST PRACTICE #3:

DESIGNING AND IMPLEMENTING RIGOROUS, CCSS-ALIGNED CURRICULUM AND ASSESSMENTS THAT PROVIDE ACCESS TO THE CORE CONTENT FOR ALL STUDENTS

Perhaps the most time-intensive shift in transitioning to the CCSSM is ensuring that there is a demanding, accessible, and coherent curriculum with high-quality formative and summative assessments in place. Building on previous standards-based reforms and borrowing practices and resources from across the country, several California school districts are addressing this challenge in innovative ways.

Using teacher-designed curriculum: Savvy districts are looking to teachers to design curriculum in order to build in-house capacity for site-level CCSS work. Faced with fewer central office staff and reduced budgets for purchasing instructional materials and assessment solutions, many school districts have decided to "insource" this work. Enlisting teachers to design curriculum creates a cadre of Common Core experts who can help drive other site-level changes. As April Moore, the director of curriculum and instruction at Corona-Norco Unified School District reflects, "It's really paid off to have those teacher leaders who were involved in redesigning the curriculum leading site- and district-level professional learning on transitioning to the Common Core."

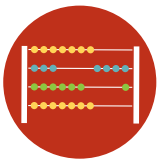
Both Oakland Unified and San Francisco Unified school districts used a similar strategy by employing teacher leaders across the district to design, pilot, and scale a curriculum. The teachers were not left to figure things out on their own. Rather, they were supported by math experts who crafted yearlong professional development and a math teacher toolkit that highlights high-leverage pedagogies and teaching strategies for diverse learners. According to Jim Ryan, the STEM executive director for SFUSD, "It is important that our students get the best instruction possible."

Focusing early on assessments: Many districts have focused their efforts on assessments first because they want something to help drive decision-making about changes to pedagogy and curriculum. High-quality assessments help teachers and administrators know whether new instructional strategies and materials are working, and for whom. Educators in some districts systematically and carefully analyze results from one unit, and using this information to decide which concepts will need continued focus in the following unit. This effort helps them identify which students may benefit most from front-loading or breaking down specific math content so it is more accessible. And it helps them modify curriculum or instructional techniques they plan to use in the future.

Some districts have found that engaging teachers to develop common assessments as part of the curriculum creation process promotes cross-site collaboration and enhances the level of support teachers feel in transitioning to the CCSS. Superintendent Sandy Thorstenson from Whittier Union High School District in Los Angeles County attests that involving teachers to develop common end-of-unit performance assessments is very productive. "We couldn't think of a better way to get our teachers up to speed on the Common Core than having them design assessments. It's a performance task for teachers. It focuses them on what students are going to need to know and how they can be successful. … You end up with a very consistent approach from site to site without mandating it from the top."

Combining teacher-created and outside resources: Many districts exhibit a blended approach to curriculum and assessment design, combining teacher-created curriculum and assessments with those they purchase or access for free. Numerous districts, for example, mix assessments from the Math Assessment Resource Service[23] and blend them with teacher-created items. Teachers from Bulldog Tech, a New Tech middle school in the Silicon Valley, often start with a MARS performance task to build longer "problem-based" projects for their students. Teachers appreciate having these high-quality resources and the autonomy to customize them to meet the needs of their students.

While the extent to which districts are standardizing curriculum and assessment varies from district to district, common curricular elements include: (a) identifying the essential standards the unit will address; (b) developing an end-of-unit assessment that involves performance tasks; (c) offering questioning strategies, academic vocabulary, and other tools to support language acquisition and greater depth of knowledge; and (d) providing frequent opportunities to include real-world application of math concepts.



BEST PRACTICE #4:

ENGAGING STUDENTS—INCLUDING ENGLISH LEARNERS—IN HIGHER ORDER THINKING AND CONCEPTUAL UNDERSTANDING THROUGH DISCOURSE AND LITERACY

Traditional math instruction is often characterized by rote memorization of specific "steps" to solving a problem and frequent practice repeating those steps over and over again. In many cases, the "math" behind a problem is not discussed in depth. Now, however, the CCSSM and mathematical practices are designed to combine memorization with reasoning, literacy, and collaborative discourse. This means math instruction involves more reading, writing, and speaking than it did under the previous standards.

Teachers are encouraged to think about math and language in tandem, not as two separate entities. They are urged to examine what language skills will be needed to solve a problem as they are planning their lessons.

Developing conceptual understanding through language development: While memorization and procedural fluency (i.e., adding, subtracting, multiplying, and dividing) remain important skills, the goal is for students to collaborate with others, explain their own thinking and understand each other's thinking. In order for all students to engage in this type of learning, teachers must be skilled in teaching literacy and language development. This is particularly important for English-learner students. In math, these students may need to learn subject-specific academic language in order to understand a particular concept or topic. Mathematics is full of words and phrases — such as "estimate," "as the crow flies," or "quantify" — that are key to solving problems, collaborating with peers, or learning specific math skills. Sometimes direct instruction about the "language of math" can help English learners engage fully in the Common Core math classroom.

Cutler-Orosi Joint Unified School District, where 48 percent of the students are English learners, adopted a districtwide focus on literacy in all subject areas, paying particular attention to literacy in math. Superintendent Yolanda Valdez describes these literacy initiatives as the "cornerstone" of the district's Common Core implementation strategy, especially in math.

Harold Asturias, director of the Center of Mathematics Excellence and Equity at the Lawrence Hall of Science at UC Berkeley, advises schools and districts on how to support English learners in math classrooms. He encourages teachers to think about math and language in tandem, and not as two separate entities. He also urges them to examine what language skills are needed to solve a problem as they are planning their lessons. He suggests teachers provide students access to bilingual instructional materials, read text out loud, and explicitly teach students strategies for analyzing and

decoding word problems. In addition, he helps teachers consistently challenge students to go simultaneously to the next level of development in both math and language. Collaboration with English-learner coaches and other English-language development experts can support teachers with strategies to develop the reading, writing, and speaking skills of English learners so they will be able to fully participate in rigorous math coursework.

Tustin Unified School District uses technology to help English learners develop the language skills needed to excel in math. As Kathie Nielsen, chief academic officer in Tustin Unified School District, describes, "[Technology] levels the playing field in a lot of ways. For English learners, when the teacher is asking for comment or discussion via a blog, all students have the ability to comment, access all the comments, and play off other kids' comments. With processing time, kids who were silent before come alive. They have great things to say. When students are deeply engaged by having their voice in discussion, deeper learning takes place. We use a learning management system to actually grade the comments and participation. It's not how much, it is the quality and the thoughtfulness that goes into the responses. Technology really helps us raise the bar." Other districts — like Paramount Unified in Los Angeles County, with a third of its students officially identified as English learners — purchased digital CCSSM-aligned content and computing devices, and hired computer lab staff to both teach and assess the new math standards.

Emphasizing real-world application of math knowledge and skills: To align with Common Core expectations, district leaders are shifting lesson and unit designs to include more elements and time focused on real-world application and student discourse. Tustin's Kathie Nielsen emphasizes the importance of hardwiring real-world application into daily math instruction: "We ask our teachers to put themselves into their students' shoes and for every lesson answer this very simple question, 'When am I going to need to use this in my life?'" Berkeley Unified has established partnerships with nearby Bay Area science museums and research centers to reinforce and expand student engagement and the application of the new math and science standards through workshops such as "Gravity in Motion" and "3-D Geometry".

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In some settings, school leaders are helping teachers build questioning strategies into units or lessons and providing teachers with rubrics on what constitutes strong mathematical discourse. Kevin Tallon, a principal from Wasco Union High School District in Kern County, stresses the importance of using the curriculum development process to help teachers elevate the discourse in their math lessons: "We had to develop a consistent way for asking questions and having healthy academic discourse around math concepts."

These emerging practices are only the beginning of what schools and districts can do to support each learner to achieve at high levels in math. The Common Core standards and mathematical practices are designed to make math relevant, rigorous, and part of a coherent curriculum that prepares all students for college and career.

BEST PRACTICE #5:

ENGAGING PARENTS AND CAREGIVERS

Districts are learning that these changes to curriculum require significant time, expertise, and effective communication with caregivers — some or all of which may be in short supply. Especially for math, most parents and other caregivers expect teachers to sequentially move through a single textbook. Shifting to more complex, teacher-driven curricula that draws on multiple sources of content requires significant outreach to parents. Powerful engagement with parents and other caregivers includes explanations about why the curriculum looks different and provides tools to help them navigate and experience new instructional materials. Clear communication, messaging, and offers of support and training are key to ensuring parents and other caregivers are informed about how best to support their children.

Several districts have dedicated significant resources toward Common Core outreach activities. These efforts most often include caregiver engagement strategies to ensure that parents and guardians are aware of the district's Common Core State Standards implementation plans. Los Angeles County's Paramount Unified, for example, earmarked funding to deliver bilingual workshops designed to inform caregivers about the standards and relevant assessments. And Baldwin Park Unified School District, also in Los Angeles County, has a dedicated set of online Common Core resources in both English and Spanish on its district website in addition to actively engaging parents and caregivers with Common Core workshops since 2010.

In addition to posting numerous Common Core State Standards resources on their website in multiple languages, Jefferson Elementary School District in Daly City is piloting a CCSS-aligned report card and has brought in outside experts, including Professor Jo Boaler from Stanford University, to talk with parents about the math standards. Another Bay Area district, West Contra Costa Unified, offers parents classes to educate families about grade-level expectations and how they can support their children and their academic success as part of their Parent University. In addition, the district hosted several town hall meetings to discuss the Common Core and the district's investments in technology, professional development and instructional materials to support it. West Contra Costa schools are also hosting Common Core family nights to explain the new standards to parents, and the district is supporting students to create a video designed to help their peers and parents understand what the new standards are and why they are important.[24]

More often than not, however — and despite requirements from the Local Control Funding Formula law — districts do not adequately engage members of their communities to support their CCSSM implementation efforts.[25] Much more could be done.

CONCLUSION

The adoption of the Common Core math standards provides an opportunity to rethink the ways in which all students are afforded access to high-quality math instruction. The shifts in the Common Core math standards require focus, coherence, and rigor in every math classroom, and districts will best achieve this by being strategic and intentional in their implementation activities. It is imperative that we close glaring math achievement gaps in our state and provide a clear path for more students to pursue education and career opportunities that rely on a strong foundation in math. As we continue to bring math Common Core standards to life in classrooms throughout the state, we must ensure that each and every student, and particularly low-income students and students of color, will be able to achieve at high levels in math.

10 EQUITY-RELATED QUESTIONS EVERY DISTRICT AND SCHOOL SHOULD BE ABLE TO ANSWER ABOUT COMMON CORE MATH:

In order to ensure that each and every student in California graduates proficient in math – proficient and ready for a range of postsecondary education options — we must use the Common Core to close math opportunity and achievement gaps. Districts and schools need to ask themselves the following questions and adequately address them:

1. Do all our educators believe that each student is capable of achieving at high levels in math? Do each of our district administrators, teachers, principals, and coaches subscribe to and contribute to a culture of high expectations for all students to become mathematically proficient, including expanding access to high-level math courses, providing adequate supports to English learners and students who are struggling academically?

2. Does our district provide ample time, coaching, and other supports for teachers to learn, collaborate and plan together, vet and refine curriculum, discuss student work, and approach math instruction with a continuous improvement lens?

3. Are there clear and consistent feedback loops among the district central office, the school sites, and the classroom to inform, support, and guide compelling CCSSM implementation efforts?

4. Are families routinely informed about and engaged with the instructional shifts embedded in the Common Core, district implementation progress and activities, and opportunities to learn how best to support their child(ren) to succeed in math?

5. Is technology being used to supplement the curriculum and provide both review and advancement opportunities tailored to student learning needs?

6. Are teachers utilizing teaching strategies and available resources that address the needs of all learners, especially English learners and students with identified special education needs?

7. Do the district's Local Control Accountability Plan goals support needed shifts in math instruction and include sufficient investments to make it happen?

8. Are there robust assessments and structures in place for measuring progress and holding schools and teachers accountable for helping all students become mathematically proficient?

9. Is the district developing partnerships with teacher education programs — either traditional or non-traditional — to provide pathways for effective math teachers to work in high-needs schools?

10. Are all students accessing math courses that offer them the content they need to meet and/or exceed the CCSSM standards? Both district and state graduation requirements ought to reflect these expectations.

END NOTES

1 According to the National Assessment of Educational Progress, 15 percent of California eighth-grade students who are eligible for free- or reduced-priced lunch earned proficient or advanced scores on the 2013 NAEP math assessment, compared to 58 percent of their non-eligible peers. http://nces.ed.gov/nationsreportcard/subject/publications/stt2013/pdf/2014465CA8.pdf.

2 Smarter Balanced testing takes place in grades 2–8, and 11.

3 See Jeffrey Max and Steven Glazerman, "Do Disadvantaged Students Get Less Effective Teaching?: Key Findings from Recent Institute of Education Science Studies," Washington, D.C.: Institute of Education Studies, NCEE Contract number: ED-04-CO-0112/0007, (January, 2014). See also Carrie Hahnel and Orville Jackson, "Learning Denied: The Case for Equitable Access to Effective Teaching in California's Largest School District," Oakland, CA: The Education Trust – West, (January, 2012).

4 U.S. Department of Education, Institute of Educational Sciences, National Center for Education Statistics, National Assessment of Educational Progress (2013). The Nation's Report Card: Mathematics, http://nces.ed.gov/nationsreportcard/subject/publications/stt2013/pdf/2014465CA8.pdf.

5 The Howard County Public School System (Maryland) offers recommendations for addressing shifts in mathematical practices in order to align them to the CCSSM. http://hcpssaccessiblemathematics.wikispaces.com/home.

6 This variation was documented in a summary report of the statewide Common Core State Standards Implementation Survey conducted by the California County Superintendents Educational Services Association in fall 2013 (available at: http://ccsesa.org/wp-content/uploads/2013/12/CCSS-Survey-Results.pdf). For example, about half of school districts reported having formal, written CCSS implementation plans. Only about half of school districts reported that all their teachers in all grades understand the content, structure, and organization of the CCSS in either English language arts or math. And only about half of school districts reported that their teachers identified strategies or instructional resources to support the transition to the CCSS for English learners and students with disabilities.

7 The state allocated $1.25 billion in a block grant to districts (about $200 per student based on 2012–2013 student enrollment) to fund CCSS implementation in 2013–2014 and 2014–2015.

8 See Hannah Oh, "Common Core Costs: Examining California's Five Largest School Districts," State Budget Solutions, September 16, 2014. See also Kathryn Baron, "Proposed Bill Would Provide $1.5 Billion More for Common Core Implementation," EdSource, March 5, 2014, http://edsource.org/2014/proposed-bill-would-provide-1-5-billion-more-for-common-coreimplementation/8440#.VS4z-_nF_xQ. The bill was authored by Assemblywoman Susan Bonilla (AB 2319) to establish an additional block grant for CCSS implementation was unsuccessful in 2014, but her 2015 bill (AB 631) to provide a block grant to CCSS implementation could prove to be successful. Furthermore, the governor's budget proposal in May 2015 earmarked more money for education, but that proposal allows districts to spend that money in other ways beyond CCSS implementation.

9 The New York State Department of Education maintains a comprehensive website, EngageNY (www.engageny.org) to support several aspects of education reform, including CCSS implementation. The website includes thousands of tagged and searchable resources (e.g., curriculum maps, videos, lessons, sample assessments, teacher perspectives) to support K–12 educators and parents. The Massachusetts Department of Education organized a Model Curriculum Project that engaged teachers to develop over 100 model curriculum units aligned to the CCSS and designed with Grant Wiggins and Jim McTighe's Understanding by Design framework. Model district curriculum maps and the units are available on the state's website (www.doe.mass.edu/candi/model/default.html). The Ohio Department of Education also offers a model set of curricula for CCSSM, which includes an aligned assessment system, http://education.ohio.gov/Topics/Ohio-s-New-Learning-Standards/Mathematics.

10 EdReports is a non-profit organization that convenes educator review teams to review instructional materials for their alignment to CCSS. Teams reviewed over 80 grade-level curricula series published by nine different publishers and found only two met expectations for CCSS alignment (www.edreports.org). Both Morgan Polikoff and William Schmidt have reviewed an extensive number of math textbooks and find that most of them are not well-aligned to the CCSSM. See Morgan Polikoff, "How Well Aligned Are Textbooks to Common Core Standards Mathematics?" American Educational Research Journal, 0002831215584435, first published on May 6, 2015 doi:10.3102/0002831215584435. See also Center for the Study of Curriculum, "The Textbook Navigator/Journal: Development and Background," East Lansing, MI: Michigan State University, http://education.msu.edu/csc/pdf/Navigator-Report.pdf.

11 See Appendix A of the California Department of Education Mathematics Framework, http://www.cde.ca.gov/ci/ma/cf/documents/aug2013apxacourseplace.pdf.

12 California's current standards demand that all students achieve proficiency in math to match the minimum math prerequisites for admission to California's public university systems and most institutions of higher education. But California's minimum graduation requirements in math and most district graduation requirements do not require students to successfully complete courses that include the Common Core math standards in order to graduate.

13 The university systems require students to pass these courses with a "C-" grade or better.

14 California Department of Education, Dataquest, 2015.

15 In 2013–2014, 55 percent of all students graduating from Tustin Unified were reported to be "a-g" eligible, up from 37 percent in 2002–2003. In that same timeframe, "a-g" rates for student subgroups also substantially improved. The rate for African American students increased from 19 to 50 percent, the rate for Latino students increased from 17 to 38 percent, the rate for white students increased from 48 to 65 percent, and that for Asian students increased from 58 to 80 percent.

16 The San Francisco Unified School District board of trustees voted in December 2008 to require students in the Class of 2014 and beyond to complete the "a-g" courses required for UC/CSU eligibility in order to graduate. While the UC/CSU system requires grades of "C-" or better, SFUSD students are able to graduate with "D" grades.

17 Jo Boaler and Megan Staples, "Creating Mathematical Futures Through an Equitable Approach: The Case of Railside School," Teachers College Record, 110(3), (March 2008): 608-645. The authors document key practices at a California urban high school that included instruction predating but aligned to CCSSM. Low-income students and underrepresented students of color learned more math, enjoyed learning math more, and took higher levels of math in high school compared to their peers in two comparison schools. Specifically, 41 percent of students took pre-calculus or calculus before the end of their senior year.

18 According to the College Board, of the 65,071 students in California who took an AP Calculus exam in 2013, only 2 percent were African American and 23 percent were Latino. Similarly, of the 4,964 Californian students who took the AP Computer Science exam in 2013, only 74 (2 percent) were African American and 392 (8 percent) were Latino. (Source: research.collegeboard.org/programs/ap/data/archived/2013)

19 See Jeanne Oakes, *Keeping Track: How Schools Structure Inequality,* 2nd ed. (New Haven: Yale University Press, 2005). See also Carol Burris, Jay Heubert, and Hank Levin, "Accelerating Mathematics Achievement Using Heterogeneous Grouping," *American Educational Research Journal,* 43(1), (March 20, 2006): 137-154.

20 In 2013, California dramatically reformed the way it funds school districts. The new finance system, called the Local Control Funding Formula, includes increased base funding as well as extra funding intended to support the needs of low-income students, English learners, and foster youth. Each school district, county office of education, and charter school is required to develop a 3-year Local Control Accountability Plan outlining goals reflecting eight priorities outlined by the state, along with activities and resources committed to achieving those goals. For an archive of LCAPs and other resources, visit: http://www.lcapwatch.com.

21 Complete College America, "Remediation: Higher Education's Bridge to Nowhere," Indianapolis, Indiana, (April 2012), http://www.completecollege.org/docs/CCA-Remediation-final.pdf. This report documents that nationally more than 50 percent of students entering two-year colleges and nearly 20 percent of students entering four-year universities were placed in remedial classes, and graduation rates for these students are deplorable – 1 in 10 students complete community college degrees within three years and little more than a third of students complete a bachelor's degree within six years. The study includes information about the California State University system, reporting that more than 60 percent of the students who took remediation are students of color. Data were from the students who entered college in the fall of 2006.

22 Frank Adamson and Linda Darling-Hammond, "Funding Disparities and the Inequitable Distribution of Teachers: Evaluating Sources and Solutions," *Education Policy Analysis Archives*, 20(37), (November 19, 2012): 17-24.

23 See http://toolkitforchange.org/ to learn more about MARS, which is funded by the National Science Foundation and staffed by a team of individuals from Michigan State University, the University of California at Berkeley, the Shell Centre at the University of Nottingham in the UK, and Inverness Research Associates.

24 Candese Charles, "School District Holds Town Hall Meeting to Discuss Funding, School Services, and Common Core," *Richmond Confidential*, March 2, 2015, http://richmondconfidential.org/2015/03/02/schooldistrict-holds-town-hall-meeting-to-discuss-funding-school-services-andcommon-core/.

25 When we reviewed LCAPs from the largest 50 districts in California, we found that less than 20 percent of them included plans to engage community members in CCSSM implementation.

OUR MISSION

The Education Trust–West works for the high academic achievement of all students at all levels, pre-k through college. We expose opportunity and achievement gaps that separate students of color and low-income students from other youth, and we identify and advocate for the strategies that will forever close those gaps.

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