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States That Are Leaning into Math Improvement Share Their Lessons

By Paolo DeMaria and Valerie Norville

Amid faltering K-12 performance in math across much of the US, policymakers in a handful of states have decided that something more than a garden-variety refresh of math learning standards is in order.[1] Leaders in various states, including Maryland, North Carolina, Illinois, and California, have marshalled a host of stakeholders to tackle what they see as a multipronged problem, of which standards revisions form only part of the solution.

The resulting plans vary.[2] But the processes many states undertake share common elements. The need to gather feedback iteratively from disparate sources is a constant. Many of the challenges the planners hope to address are also the same:

- a mismatch between the math required for high school graduation and what employers and college admissions offices will require;
- underprepared teachers and low levels of overall quality in math instruction, a problem compounded by the number of teachers with conditional certification;
- lack of support for teachers in their efforts to help students who struggle with math;
- families who are not well prepared to support efforts to boost students' math achievement; and
- a prevailing mindset that only some students can master math.

ENGAGING STAKEHOLDERS

The **Illinois** State Board of Education team launched needs assessment surveys in spring 2025: first to teachers, teacher leaders, and coaches; second to school and district leaders; and third to leaders of educator preparation, regional offices, and intermediate service centers. "We were trying to get a sense of what people were thinking about mathematics across the state," said Dr. Ronda Dawson, executive director of teaching and learning at the Illinois state board. "And we decided to use those results as a foundation for a greater conversation."

The surveys laid the groundwork in June 2025 for the state's first numeracy summit, which convened math leaders, state association experts, educators, and community partners. "It opened up the door for conversations about what was to come next, what the approach should be, and having every single voice as a part of that process," Dawson said.

Afterward, state leaders put together a team to draft the initial iteration of the numeracy improvement plan, which in turn kicked off several rounds of listening tours and focus groups across the state—in essence, the same playbook they had used to good effect for literacy a few years earlier. "The difference is that for literacy, we had legislation identifying those big flags we were working toward," said Kirsten Parr, project lead for standards and instruction at the Illinois state board. In addition, "in our first round of literacy listening [sessions], we engaged in four areas of the state. But we heard . . . that that wasn't enough." For math, there were 16 stops on the tours, she said. The Illinois plan was adopted and released in June 2026.[3]

North Carolina began similarly, with interviews, focus groups, and surveys. Results were funneled to a data review committee, said Dr. Charles Aiken, section chief for math, science, and STEM at the North Carolina Department of Public Instruction. The committee comprised school and district leaders as well as community college and university experts accustomed to working with large data sets. Its members determined that standards revision was warranted and recommended that the state board initiate that process. Aiken pointed to other groups that played a role: the North Carolina Collaborative for Math Learning, where math educators and professors address problems of practice, and the Friday Institute at North Carolina State, which has been leading the push to address gaps in data literacy and statistics. The business community underscored their need for students to leave school with these skills.

North Carolina has a separate group to write revised standards, which went through three drafts, with rounds of feedback in between. The state board approved the standards at their October 2026 meeting, kicking off a two-year countdown before the revised standards will be implemented.

Primary allies in **Maryland's** plan for math have included university partners and the Accountability and Implementation Board, a separate body that oversees the rollout of the state's overarching education plan, the Blueprint for Maryland's Future. "We've gotten a lot of buy-in, particularly as we've anchored it in some of the national trends where we've lost ground in mathematics," said Dr. Joshua Michael, Maryland state board president.

The process to revise math plans can be arduous. **California's** state board adopts frameworks for its content areas, and the development of the math framework took considerable time. "That has happened with most frameworks," said Dr. Linda Darling-Hammond, president of California's state board, which adopted a revised math framework in 2023. "After there's quite a bit of controversy about one thing or another, sometimes it has to iterate and iterate and iterate. It's a pretty long process, and once we finally adopt the framework, then you have to also worry about adopting the materials, which is another very long process."

More voices do not necessarily point state leaders down a clear path. In Illinois, some groups pushed back on the plan's emphasis on community engagement, saying the focus should be on teachers and leaders, Dawson said. Others said there absolutely needed to be a robust section on parent support.

"It becomes a really difficult task to hear the feedback and then set a direction," Parr said. "It almost feels like sometimes you're choosing from the menu, and you're trying to choose from this side of the menu and this side of the menu in order to kind of balance."

Darling-Hammond decries the trap that states sometimes fall into as they gather input on how to reform standards and curriculum. "Is it math for understanding, or is it mastering your math facts? Is it phonics or whole language? Whatever it is, there's a tendency to treat these things like polar opposites. The best instruction is always building on strong conceptual understanding and teaching skills," she said. "The answer is always both."

COLLEGE- AND CAREER-READY MATH

Research into how high-achieving countries teach math animated California's framework revision, Darling-Hammond said.[4] Top countries' schools "teach fewer topics every year, and they go deeper into those topics," she said. "They do not teach Algebra, Geometry, Algebra 2, in that order separately. They teach integrated mathematics. So kids are learning how to think flexibly—both about, for example, the algebraic concepts and the geometric concepts that go together. . . . They don't track, and they don't even track at the beginning of high school."

"Those are some of the places we started from," Darling-Hammond said, adding that California planners succeeded in identifying big ideas—core math concepts that deserve deeper exploration, but that there are still too many standards.

Early collaboration with universities has been key for many states' K-12 math plans. Before K-12 leaders began their work, the state universities in North Carolina had already made recommendations on rethinking math pathways, one of which was better coordination with K-12. This idea enabled leaders to talk productively "not just [about] K-12 but K-16: What is the math that we think every kid needs? What should every kid have . . . the opportunity to take?" Aiken said.

The Maryland General Assembly passed the Blueprint for Maryland's Future in 2021 based on reform recommendations from the Kirwan Commission. "The Blueprint did not call for a math policy," Michael said. "But there are some implied components that we have lined up with." Specifically, its third pillar stresses college- and career-ready education. "We've used that structure to anchor how we are approaching our secondary course redesign in math," he said. "We have been meeting and talking about this Algebra 1, Geometry, Algebra 2 progression for a long time, and specifically in Maryland, it was misaligned with our Blueprint initiative for all students to be college and career ready by the end of 10th grade. By college and career ready, we don't mean ready to graduate high school, we mean on track and ready to pursue their college and career goals."

"We have a national need to be looking at how we align and rethink the high school math curriculum," said Darling-Hammond. "There's a lot of repetition of Algebra 1 and Algebra 2."

Both Maryland and North Carolina drew on the expertise of the Charles A. Dana Center at the University of Texas at Austin and its Launch Years Initiative for rethinking secondary school math. "Our community colleges and universities have been at the table with Launch Years from the start," Michael said. "That has made this thing seamless. . . . [W]e had support from the University System of Maryland [and] from community colleges, and they very much helped us . . . synthesize the core sequence down to two years in integrated Algebra 1 and 2. They helped us determine which standards were most needed there as a part of that course redesign work." University buy-in has been critical for the K-12 plan, he added.

Challenges remain. The Maryland state board requires four years of math for a student to graduate, and the university system also requires four years. But "it's not one-to-one translation," said Lyndsey Brightful, executive director of mathematics in Maryland's Division of Instructional Programs. It is something that the department and higher ed officials are working on, though. "Our end goal really is to get to a place where if you graduate Maryland with a high school diploma, no matter the pathway or course sequence you take, they recognize that you have the admissions requirements for the University System of Maryland."

The North Carolina graduation requirement will likely be similar to Maryland's, Aiken said: Integrated Math 1 and Math 2 in high school plus two advanced math courses beyond. "That's going to require some policy shifts," he said. "We work really hard to make sure that this does not lower our graduates' ability to apply for postsecondary."

Connecting math to careers is equally important. "We need to be very intentional about the way that we connect the numeracy work to career and technical education because so many of those fields require fluency in mathematics," Dawson said.

"We have a couple of high schools that have done some really cool work . . . where they match specific CTE courses with specific math courses so the student is doing both at the same time," Aiken said. He would like to see more discussion in North Carolina to expand the conversation around integration and expansion of real-world applications.

INSTRUCTIONAL QUALITY

"Much of the problem in mathematics throughout the grades . . . is poor instruction, inadequate instruction, not enough time for instruction, not enough skill in instruction, wrong curricula," Darling-Hammond said. "We've got to solve the math teaching problem."

At the core level of math instruction, referred to as Tier 1, teachers need to know math content really well in order to help students bridge the gaps in their knowledge, Michael said. "That requires us to have strong instructional materials. That requires strong teaming and developing of math teacher practice. If you get inconsistent Tier 1 instruction, you get a whole cohort of kids that need support. Tutoring's a big piece of this, . . . but we're not going to tutor our way out of this problem."

"We have a math-phobic country, and even to some extent a math-phobic elementary teaching force," Darling-Hammond said. "It's important that we think about the training of math teachers, including for elementary, and that we do it in ways that may bring confidence and joy to the teaching of math."

Here, too, improving instruction requires melding many elements. "The more you get the coaching working, the more you get people in the field working in their teams, working with the new curriculum materials and with good instruction, folks who come in with less preservice will be in settings, we hope, where they're surrounded by colleagues who are helping them learn how to plan and implement math instruction," Darling-Hammond said. "So my view is you just have to do all of the things at the same time."

In California, the Commission on Teacher Credentialing and the California Council on Teacher Education are important partners—the former for informing the accreditation process for education preparation programs and the latter for creating learning communities across the programs. "We have a lot of really committed people who want to do good work in those settings," Darling-Hammond said. "So I think within five years, we'll have a different preservice context for training math teachers."

SUPPORTS FOR STRUGGLING STUDENTS

"One of the things that we hear repeatedly from each focus group and from listening tours is, 'We need examples. What does this look like? What are the do's? What are the do-nots?' " Dawson said. "One of the things that we'll do [in Illinois] is provide some examples of what that might look like for core instruction and what it would look like for Tier 2 and for Tier 3 across the different grade bands. Because that's the piece that I think is missing, where we understand that we need to have our multi-tiered system of supports [MTSS]."

Maryland also will focus on how to help teachers help students who need more time. "Everybody's going to hit a wall at some point," Michael said. "The question for us to answer is, what do the adults do, both in school and at home, when the student struggles? Do we tell them that they are not a math person? Do we have support to offer to them to help them get across that gap, whether it's a gap in skill, gap in confidence, gap in understanding? . . . Or do we allow them to flail and just keep going on in the curriculum?"

The current systems often do not serve either end of the continuum, Darling-Hammond said. "We have this idea that you just move the kids through the standardized grade by grade," she said. "Often there's a pacing guide, so you're restricted to keeping it moving, even if the kids are not keeping up. And we are teaching only a small number of kids in the middle. The kids who could go further and faster are not getting necessarily much of the additional, unless we're tracking [them into advanced math classes]."

FAMILY ENGAGEMENT

Families play a key role in children's engagement and motivation in math,[5] but they may require more support to do so effectively. As one way to help them, Maryland hopes to make standards language more family friendly, as well as easier for new teachers to understand. "We've tried to simplify language," Michael said. "In Maryland, 10 percent of our teachers are conditionally certified, so people don't have training in how to read objectives. We're trying to figure out how we make standards more accessible and for parents."

Michael added that the Maryland standards have long sought to balance students' fluency with math procedures, conceptual understanding, and application. "What we have observed in the state is that procedural fluency has been neglected in a couple spots," he said, and that state officials will be "working toward supporting families in engaging around procedural fluency. It's something families are comfortable with, it kind of crosses generations of mathematics, and we want to get families there."

STATE BOARDS' ROLE

State boards have key roles in advancing math learning. "The superintendent and the state board produce power and focus and vision by the work that we do," Michael said. The state board has been "using the space to develop policy, to bring focus, to get status reports, to use that public space to ensure that we're talking about our literacy and math. . . . We provided ample time for response, review, and public deliberation. When people reach out, we have a response process." And the board has an ongoing role in monitoring progress, he said.

Michael further suggests state boards should have structured conversations about secondary math pathways before they launch a standards revision process.

Darling-Hammond advises state boards to be prepared to explain what is in their frameworks and math plans for the inevitable controversies that arise, as she did when constituents criticized the California math framework for insufficient attention to procedural fluency. She walked through all the references to fluency during a public board meeting.

The California board is able to ask state legislators to fund evaluations. "Those come back to us with information about how the process is working," Darling-Hammond said. Another way for boards to make an impact is to back the formation of statewide networks in math. The Center for the California Collaborative for Educational Excellence runs such a network. "We can get reports from them as well about what's going on in the field and hopefully that allows us to fine-tune over time."

Paolo DeMaria is NASBE's president and CEO, and Valerie Norville is its editorial director.

NOTES

1 Nation's Report Card, Grade 4 & 8 Math, Grade 12 Math, web pages.

2 Paolo DeMaria and Valerie Norville, "Leaders Back Statewide Plans to Improve Math Learning," *Policy Update* 33, no. 3 (May 2026).

3 Illinois State Board of Education, Illinois Comprehensive Numeracy Plan (June 2026).

4 See, e.g., OECD, *An Evolution of Mathematics Curriculum: Where It Was, Where It Stands and Where It Is Going* (OECD Publishing, 2024), https://doi.org/10.1787/0ffd89d0-en; Marc Tucker, *Leading High-Performance School Systems: Lessons from the World's Best* (ASCD, 2025); Andreas Schleicher, *World Class: How to Build a 21st-Century School System, Strong Performers, and Successful Reformers in Education* (OECD Publishing, 2018); William H. Schmidt and Nathan A. Burroughs, "Puzzling Out PISA: What Can International Comparisons Tell Us about American Education?" *American Educator* (Spring 2015).

5 Jiawen Wu et al., "Cognitive and Motivational Numeracy Parenting Practices: Implications for Children's Numeracy Engagement during Early Elementary School," *Developmental Psychology* 60, no. 4 (2024): 680–92, https://doi.org/10.1037/dev0001706.

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