BRIEF

Pathways to Mathematics Proficiency: State Policy Options for Personalized, Coherent Math Learning

BY PATRICK LYONS, SENIOR POLICY SPECIALIST

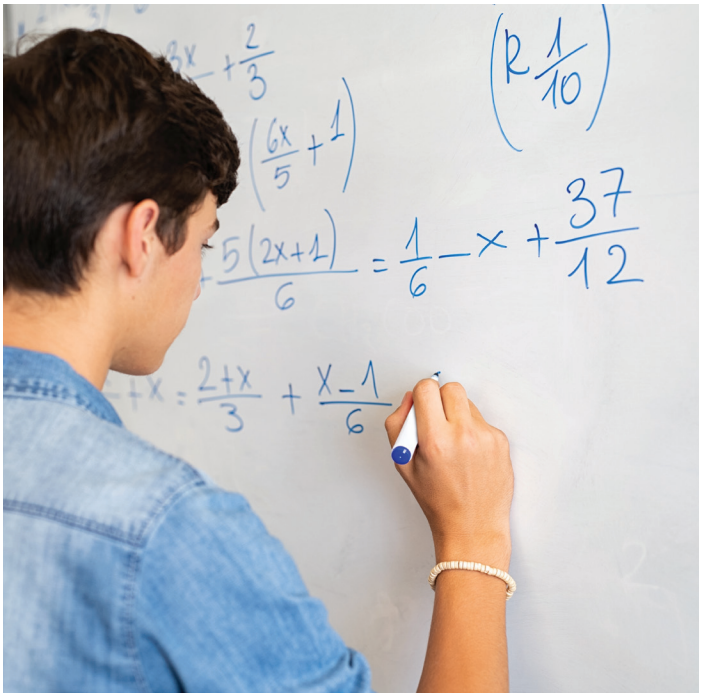
Introduction: Addressing the Decline in Math Proficiency

Across the United States, student performance in mathematics has reached alarming lows. Results from the National Assessment of Educational Progress (NAEP), known as the Nation's Report Card, show a troubling decline in proficiency and a widening achievement gap between the highest- and lowest-performing students.

In 2024, just 28% of 8th graders nationally scored proficient on the NAEP. This is particularly concerning because 8th grade proficiency predicts readiness for Algebra I—a key inflection point in students' academic trajectories. Students who pass Algebra I by 9th grade are more likely to graduate from high school, attend college and earn higher salaries. Those who don't are four times more likely to drop out of high school.

In response, many states have shifted policies to improve math education, such as requiring schools to use grade-level high-quality instructional materials (HQIM), expanding teacher professional development and hiring instructional coaches. While these strategies are important, they do not address all the complexities of learning mathematics.

Classrooms often contain students whose math skills span as many as seven grade levels. Yet many teachers are required by law or regulation to teach using grade-level HQIM, which typically only includes content determined by a student's age, not how they perform. Without access to content that spans multiple grades and skills, learning gaps accumulate each year—and teachers don't have the tools and resources to close them. The science of learning, especially in mathematics, shows that this one-size-fits-all approach does not align with how students acquire, retain, and apply knowledge.



High-Quality Instructional Materials

In response to inconsistent quality of classroom instruction, more than half of states have passed laws or published guidance requiring the use of high- quality instructional materials (HQIM). HQIM refers to textbooks and other curricular materials that are currently aligned to grade-level academic standards, are content-rich with clear learning outcomes, reflect evidence-based practices and provide a full suite of teacher and student materials.

NCSL
NATIONAL CONFERENCE OF STATE LEGISLATURES

OCTOBER | 2025

States can consider complementing grade-level instruction with policies and resources that introduce personalized, coherent academic experiences to support math recovery and growth. Personalized learning strategies ensure students are taught what they are ready to learn and what will move them toward proficiency, not just what they are supposed to learn based on their age. This approach includes academic math screeners, multi-grade instructional tools and personalized learning paths—critical tools to meet students where they are and help them move toward math proficiency.

The Science of Learning: Why Traditional Approaches Fall Short

In most classrooms today, math instruction follows a familiar model: A single teacher delivers the same lesson to all students using one textbook. Recent efforts to raise proficiency have focused on strengthening this model through more rigorous grade-level instructional materials and improved teacher professional learning. However, several principles of learning mathematics must be considered along with improvements in curriculum and instruction to meet the needs of all students.

Mathematics Learning is Cumulative: Students must master a sequence of foundational skills to be prepared for future content in mathematics. There are no shortcuts. If a student hasn't mastered a key foundational skill—like multiplication or fractions—they will struggle with higher-level concepts. Even the best uniform grade-level instruction is not designed to backfill those gaps.

This presents a slippery slope for students. Students must master dozens of new skills each year to stay "on track" and to be ready to master the next lesson. Even if a student fails to master just a handful of the many key lessons in a year they risk falling behind.

Varied Proficiency Levels: In a typical 5th-grade classroom, students are performing across a span of up to seven grade levels. However, instruction is usually limited to a single textbook and set of grade-level standards, making it nearly impossible to meet every student's needs and help them fill gaps in their learning.

Lack of Acceleration: A rigid focus on grade-level content can also hold back advanced students who are ready to move ahead but are asked to repeat content they have already mastered. A mathematics education system that includes individualized pathways addresses many of these issues. When students receive personalized intervention that targets the most important prerequisite skills for what they're learning in their core class, including those from previous grades, their proficiency rates improve, according to research from TNTP and New Classrooms. When students are given the opportunity to progress based on their current understanding, rather than where the system expects them to be, they are far more likely to reach their potential. Ultimately, a system that delivers both rigorous core instruction and tailored supplementary support will lead to more coherent and transformative math education for students, families and teachers.

Policy Options: Building a More Coherent and Personalized System for Math Learning

State leaders can enact policy that supports personalized, coherent, and scalable approaches to math instruction. There are a number of strategies states can pursue.

SUPPORT NEXT-GENERATION DIAGNOSTIC SCREENERS

Typically, state mathematics screeners have been used only in early grades to identify students who need additional support. However, states are increasingly realizing that screeners should also be used for older students so teachers, students and families are aware of students' precise foundational skill gaps. States can enact policies to require or incentivize schools to use screeners that identify specific skills a student has mastered and those they have not, including skills typically taught in prior grades. These assessment tools should offer clear, actionable data for students, teachers and families.

■ **North Dakota** SB 2213 includes a pilot program to implement a math tool with three main components. First, this tool must provide teachers with data through the use of a comprehensive universal math

screener. Next, it must give teachers individualized math learning tools that can precisely diagnose what a student knows and doesn't know and then create a personalized learning plan for each student. Finally, it must give teachers access to supplemental programs to implement the learning plan.

DEVELOP APPROVAL LISTS FOR PERSONALIZED SUPPLEMENTAL INSTRUCTIONAL TOOLS THAT CREATE PATHWAYS TO PROFICIENCY

Most state guidance for core instructional materials focuses on grade-level alignment. States can expand their focus on instructional materials in math by including supplemental tools that provide individualized, multi-grade learning pathways connected to HQIM.

■ **Texas** released an RFP and accompanying rubric for evaluating supplemental instructional materials, encouraging tools that span multiple grade levels and adapt to diagnostic results.

FUND AND SCALE MATH INNOVATION ZONES THAT PROMOTE INTEGRATION BETWEEN CORE AND SUPPLEMENTAL INSTRUCTION

States can catalyze innovation by supporting networks of schools piloting new approaches to better integrate core and supplementary instruction. These zones can test and refine models that better match students' needs.

■ **Virginia's** fiscal year 2026 budget includes grants for school districts to pilot competency-based and evidence-based mathematics learning.

DEVELOP MATH FRAMEWORKS THAT PRIORITIZE MULTI-YEAR SKILL DEVELOPMENT AND INSTRUCTIONAL COHERENCE

Many states have developed math frameworks that provide guidance to help educators align their teaching with state standards. These frameworks can be written to emphasize the cumulative nature of math over a student's academic career as well as the importance of coherence between core and supplemental instruction.

■ **California's** 2023 Mathematics Framework includes a focus on how students need to master key predecessor skills before they can access grade-level content, and to that end recommends coherence between core and supplemental instruction.

EXPAND HQIM EFFORTS TO INCLUDE PERSONALIZED SUPPLEMENTAL TOOLS

Despite research showing the importance of predecessor knowledge from previous grades for student success, many states only consider grade-level content when defining HQIM. This unintentionally

discourages the use of tools that help students catch up. By expanding this definition to include high-quality, personalized supports, states can create better learning conditions.

■ **Indiana** enacted HB 1634, which requires all students to take a math diagnostic screener, and if a student is found to be behind, they will receive differentiated interventions based on their needs.

Conclusion: From Standardization to Tailored Support

The math proficiency crisis will not be solved through grade-level instruction alone. Improving student outcomes requires embracing a personalized, coherent approach to instruction—one that reflects how students actually learn and recognizes the cumulative nature of math knowledge.

State leaders can help provide an educational experience that is grounded in the science of how children learn by investing in next generation screeners, tools, and instructional models that meet students where they are and chart a path to mathematics proficiency. States have the power to build better math systems that meet students where they are—and help them get to where they need to be.

NCSL Contact:

education-info@ncsl.org

NCSL
NATIONAL CONFERENCE OF STATE LEGISLATURES

7700 East First Place, Denver, Colorado 80230, 303-364-7700 | 444 North Capitol Street, N.W., Suite 515, Washington, D.C. 20001, 202-624-5400

ncsl.org