BRIEF

Strengthening Statewide Math Outcomes through Early Math and High-Quality Assessments

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Introduction

State leaders are increasingly concerned about math education. U.S. students in the fourth and eighth grades are still underperforming their pre-pandemic (2019) peers in mathematics proficiency, particularly in the median and lowest performing groups, according to the most recent results from National Assessment of Educational Progress (NAEP) test, sometimes called the "Nation's Report Card."

In response, several states have acted to improve math outcomes, often focusing their efforts on elementary and pre-K years with the understanding that early numeracy and foundational math skills lay the groundwork for success in future mathematics, like algebra, and into the workforce.

Why Early Math Deserves State Attention

Children's early math skills are among the strongest predictors of later academic success, not only in math but also in reading. In fact, early math competencies are linked to high school completion and college attendance. This is because math abilities grow along a known developmental progression—a trajectory that builds off the strong foundational skills children learn in earlier years—and math learning begins long before kindergarten.

Strong early math instruction is grounded in exploration and conversation; it is hands-on, joyful, and playful; it is not worksheets and drills. It looks like children jumping as they count, sorting blocks by color and size, comparing heights, or finding patterns in nature. In one classroom, children might take a "shape walk," spotting rectangles in doors and windows or circles in clocks and playground equipment. In another, they might run a pretend fruit stand—counting apples, weighing bananas, and discovering how math helps them make sense of their world.

Evidence from MDRC's Making Pre-K Count and High 5s studies demonstrated that math enrichment in pre-K that continued through kindergarten improved children's third-grade math and English reading and writing test scores. Math enrichment also led to lower chronic absenteeism, which is essential for long-term student success. The effects were largest for

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children who entered pre-K with the weakest language and self-regulation skills. These findings contribute to growing evidence about the longer-term importance of high-quality early math experiences for children, particularly those with the most room to grow. Early math enrichment experiences can lead to lasting gains for children across a variety of educational outcomes, even years later.

However, many children enter kindergarten without these foundational math skills. In 2022, over 30% of 3- to 5-year-olds were "off track" in both pre-literacy and math skills, especially children from lower-income families, according to the Child & Adolescent Health Measurement Initiative. These early skill gaps often widen over time, making early math instruction a key area of emphasis for policies intended to improve overall educational outcomes and long-term student achievement. Recent NAEP results show that while overall scores have declined, fourth-grade math scores have ticked up in multiple states as there has been an increased emphasis on high-quality instruction, materials, and interventions. This suggests that early math may be particularly responsive to strong targeted supports—and that investments in early learning can yield measurable gains quickly.

State Spotlights

States across the country are taking action to strengthen early math.

- **Utah** HB 0114 (2020) - Early Mathematics Benchmark Assessments: This bill requires the development of a statewide K-3 mathematics benchmark assessment, approved by the state board. The assessment is to be administered three3 times per year; optional for kindergarten, required for grades 1-3. The overall goal of the legislation is to identify students at risk for mathematics difficulties and measure student progress. Lastly, the legislation requires progress reports to parents/guardians.

- **Alabama** SB 171 (2022) – Alabama Numeracy Act; Alabama developed an Office of Mathematics Improvement, requires the use of evidence-based math instruction and materials, provides instructional coaches in all K-5 schools, and implemented new accountability standards for schools.

- **Mississippi** (2022) - The Mississippi Department of Education began implementing a new pre-K curriculum, Mississippi Beginnings. The new curriculum is adapted from Boston Public Schools' Focus on Early Learning framework. It integrates the Building Blocks curriculum to ensure every pre-K classroom includes intentional, hands-on math instruction.

- **Colorado** HB 1231(2023) - Improving Mathematics Outcomes in Pre-Kindergarten through Twelfth Grade Education: Colorado is investing in teacher preparation and professional development

- **Florida** HB 7039 (2023) - Florida has enacted new legislation modeled on its early reading initiatives, which emphasizes early identification and additional support for students struggling with math.

- **Kentucky** HB 162 (2024) - Numeracy Counts Act: This bill provides funding for professional learning and evidence-based instructional materials to strengthen math teaching from pre-K through grade three. It also requires the state education department to assist school districts by identifying high-quality math curricula, providing coaching and support for teachers, and offering numeracy screeners to help educators identify and address learning needs.

- **Iowa** HB 784 (2025) - This legislation requires the development of a comprehensive state mathematics plan to increase proficiency. It also requires the state department of education to develop and publish a list of valid and reliable mathematics screeners to identify K-6 students who may require additional instruction in mathematics. It stipulates that local schools must assess all K-6 students in mathematics at least three times per year, using a DoE approved screener. Lastly, the bill provides professional development opportunities for teachers in schools with low proficiency rates and requires the DoE to develop and distribute home-based resources for families.

- **Montana** HB 338 (2025) - Targeted Early Literacy and Numeracy Intervention: Focused on learners who are not on track to be proficient in literacy or numeracy by third grade. Numeracy was a 2025 addition. For students 4 years old or older, who have not completed kindergarten, the legislation authorizes districts to offer; A classroom-based program aligned with early education learning standards as determined by the state board of education. Can be offered as full- or half-day.

Why Assessment Matters for Math Learning

A growing number of states have adopted policies that encourage or require the use of developmentally appropriate assessments to measure what young children know before they reach third grade. These are important tools for teachers to understand how children think and learn and high-quality assessments inform instruction by identifying where support is needed and allowing for real time adjustments. For these reasons, it is necessary that the assessments be valid and reliable. Developmentally appropriate assessments are also an essential companion to the high-quality curriculum and instruction that many states are encouraging. States cannot meet their goals around improved early math instruction without high-quality assessments that tell them how students are performing on curriculum or the impact of interventions; no matter how much they invest in curriculum or professional development.

Unfortunately, the most prevalent math assessments for 3- to 5-year-olds are too narrowly focused and burdensome to be effective. Many current assessments focus only on counting or number recognition, which is only a small piece of early numeracy proficiency. Also, these assessments are time-consuming, expensive, and difficult to administer in the busy reality of many early learning classrooms. These limited and cumbersome assessments leave educators without actionable or timely insights.

However, high-quality assessments for early childhood numeracy do exist. Findings from MDRC's research on child assessment offers states guidance for selecting research-based, comprehensive, and easy-to-implement early childhood assessments including:

- Prioritize assessment approaches that fit naturally into early childhood classroom everyday activities, reducing the need for stand-alone testing that disrupts classroom routines.
- Adopt assessment tools that capture the full range of skills children are developing in math, not just basic skills like number and shape identification. Assessment systems should align with state early learning math standards and provide actionable insights that teachers and families can use to foster math concepts at school and home.
- Engage with teachers and families when choosing or refining assessment tools. Their insights can help ensure that assessment data generate accurate, actionable information, while minimizing added burden for educators or families.

Conclusion

Early math is not just another subject—it's a cornerstone of school readiness and lifelong learning. By investing in strong curricula, skilled teachers, and more accurate and reliable assessment tools, states can give children a strong foundation in early math skills that they need to thrive in school and beyond.

Additional Resources

NCSL's 2025 Hot Topics in Education Series included a session on early numeracy. The session highlighted promising state strategies through conversations with state leaders in Alabama, Kentucky, and New Mexico, research findings, and actionable steps policymakers can take to strengthen early math instruction and assessment.

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