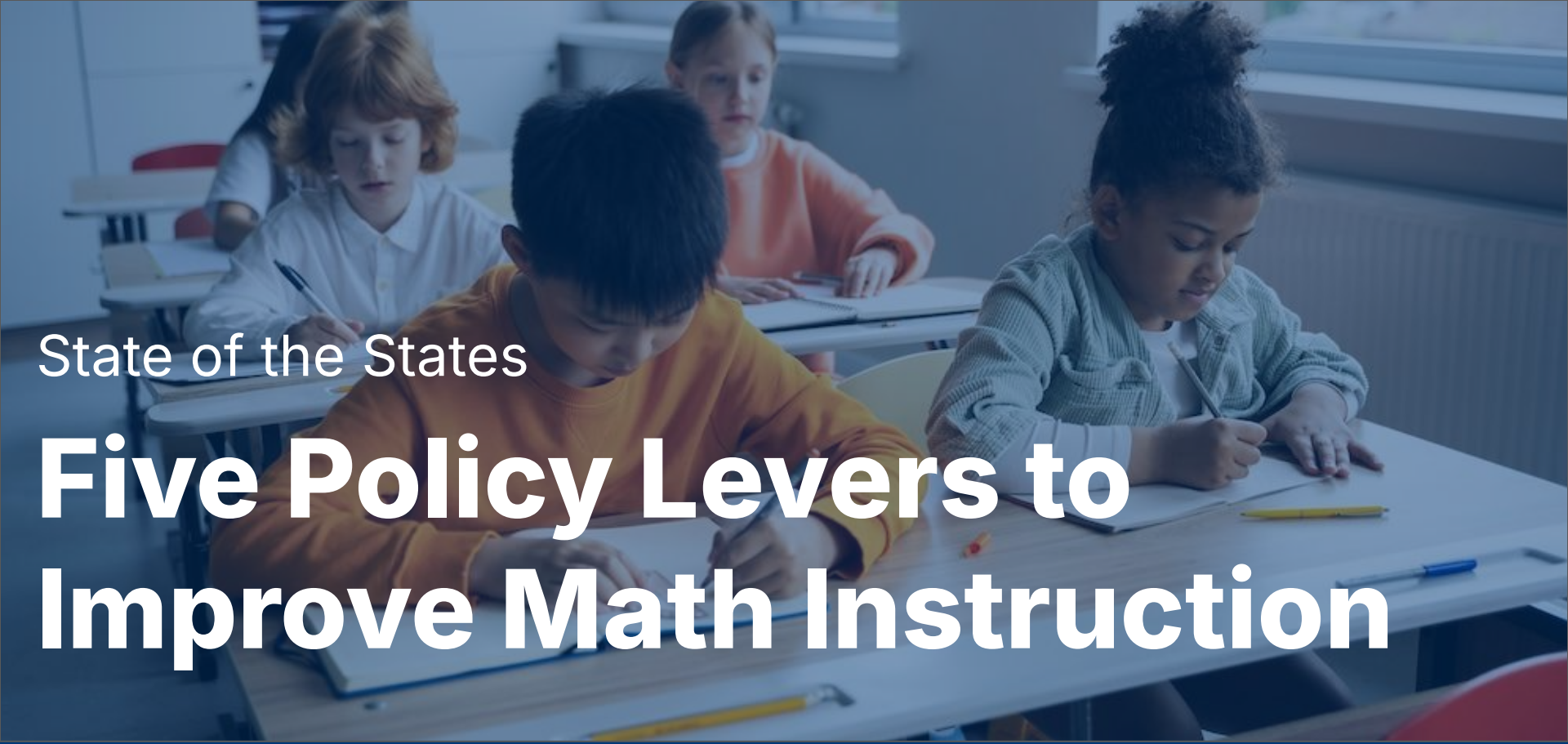


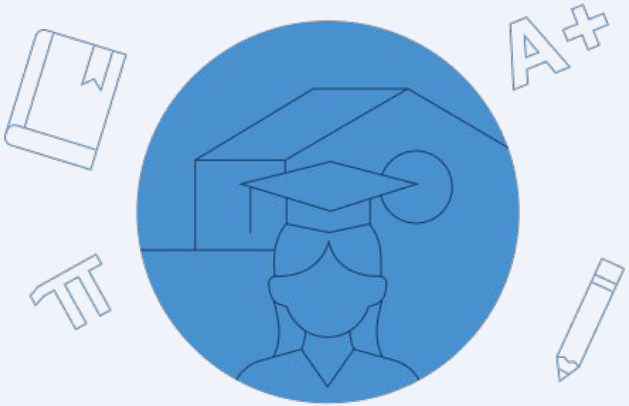
State of the States

Five Policy Levers to Improve Math Instruction

June 2025

National Council on Teacher Quality

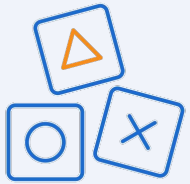
Charlotte dreams of becoming an architect. But without teachers prepared to help her master fractions, ratios, and measurement, her blueprints may never become buildings.



Great math teachers change lives–but only when they have the preparation and support to do so.

Math matters.

Students' Academic Achievement

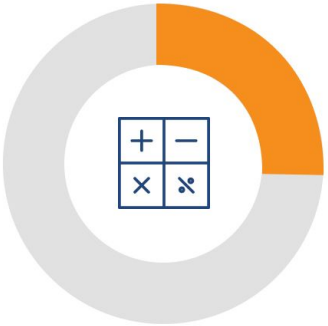


Early math skills predict students' long-term reading, math, and science achievement, as well as K-8 grade retention.[1,2]

Students' Life Outcomes

Strong math skills boost earnings,[3] increase college enrollment,[4] and open doors to fast-growing STEM careers[5]—especially for under-represented and low-income students.

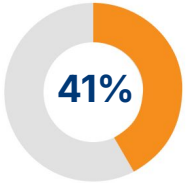
Yet far too many students don't have basic math skills.



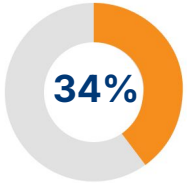
24%

of all 4th grade students are **below basic** on NAEP

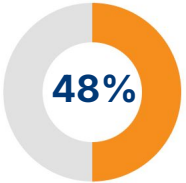
Students from historically marginalized groups suffer most from lack of access to strong math instruction.



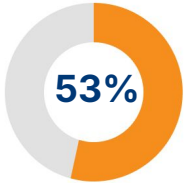
of Black students score below basic



of Hispanic students score below basic



of English language learners score below basic



of students with disabilities score below basic

Giving teachers the knowledge and skills they need to teach math effectively is fundamental for **improving life outcomes for all children** and **reversing historical patterns of inequity**.

Effective teachers are the key to improving math outcomes.

The research is clear: Math achievement drives success in academics and life. Yet, even as students' math outcomes stagnate—or decline—**most states haven't adopted bold, comprehensive strategies to turn the tide.**

When states prioritize policies that support **teacher effectiveness**, they build the foundation for lasting gains in student math achievement.

Five policy levers to strengthen math instruction

1. Set specific, detailed math standards for teacher preparation programs.
2. Review teacher preparation programs to ensure they are providing robust math instruction.
3. Adopt a strong elementary math licensure test and require all elementary candidates to pass it
4. Require districts to select high-quality math curricula and support skillful implementation.
5. Provide professional learning and ongoing support for teachers to sustain effective math instruction.

Policy Lever 1:

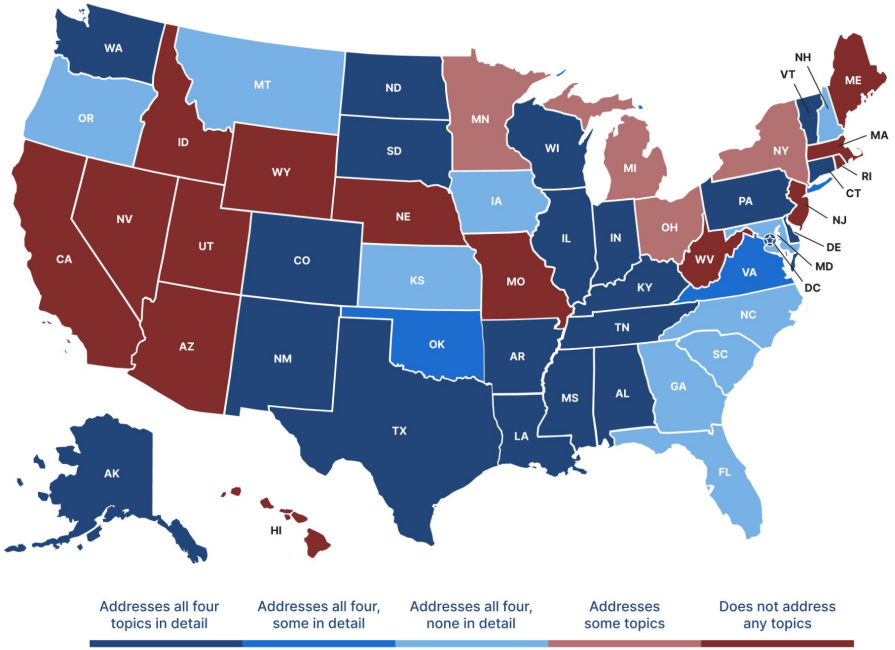
Set specific, detailed math standards for teacher preparation programs

Many states' math standards for elementary teacher prep are not clear and specific.

Only 21 states

provide clear, detailed guidance to teacher preparation programs about what they should teach in all four core math content topic areas:

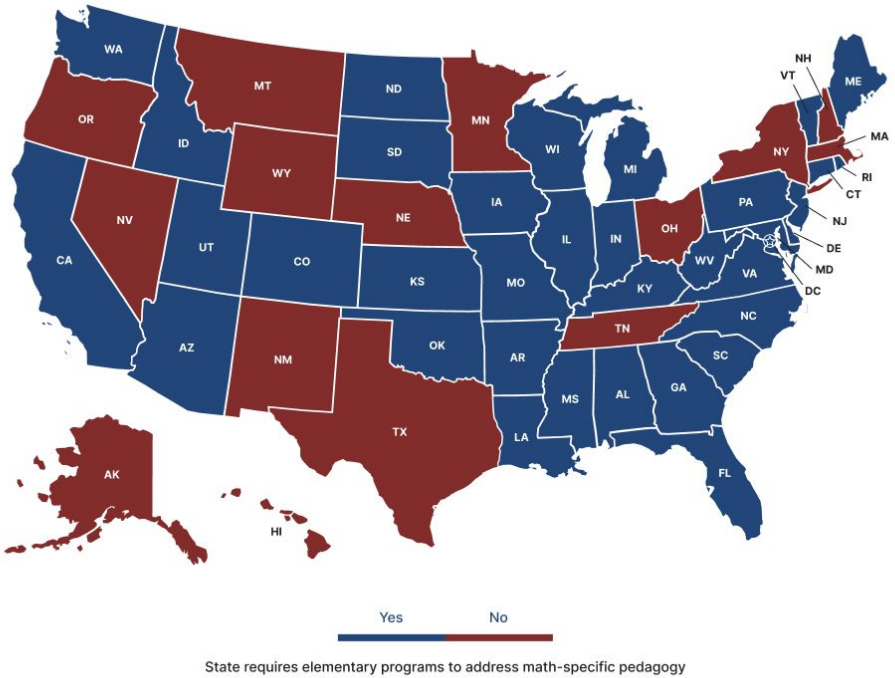
1. Numbers and operations
2. Algebraic thinking
3. Geometry and measurement
4. Data analysis and probability



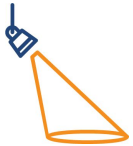
Many states don't require teacher prep programs to address math pedagogy, despite benefits to students.

15 states

do not explicitly address math-specific pedagogy in their standards for teacher preparation programs.



State Spotlight



Arkansas

Arkansas sets clear, detailed math competencies for teacher preparation programs, outlining specific concepts and examples that educators must master. These competencies go beyond content knowledge, emphasizing procedural fluency, conceptual understanding, and effective math pedagogy.

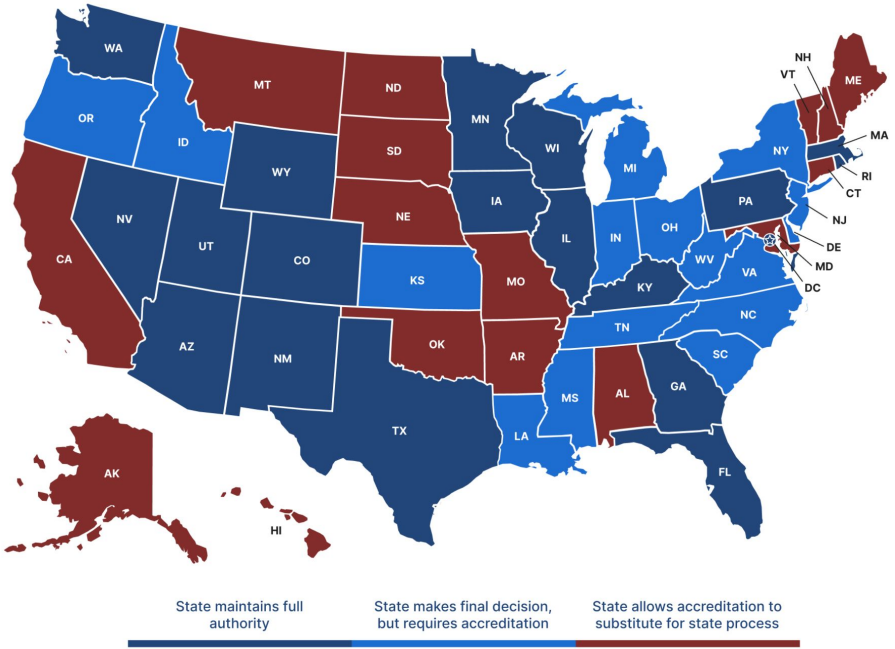
Policy Lever 2:

Review teacher preparation programs to ensure they provide robust math instruction

Without thorough reviews, states cannot ensure prep programs are adequately preparing aspiring teachers to deliver effective math instruction.

16 states

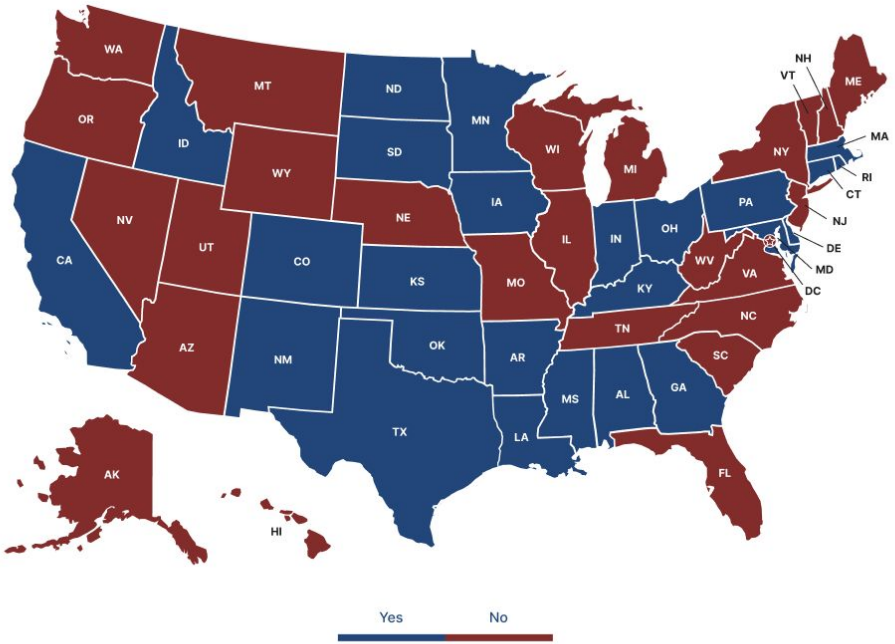
do not oversee their own program reviews, leaving them with little information about whether teachers are being equipped with essential math skills.



Reviewing syllabi is key to understanding the scope and depth of what programs actually teach.

Only half of states (25)

require the analysis of syllabi during the program review process.



State requires the review of syllabi for math courses to determine the integration of math standards as part of the program review process

Policy Lever 3:

Adopt a strong elementary math licensure test and require all elementary candidates to pass it

Licensure tests can provide a clear signal of aspiring teachers' math knowledge while also highlighting prep program quality.

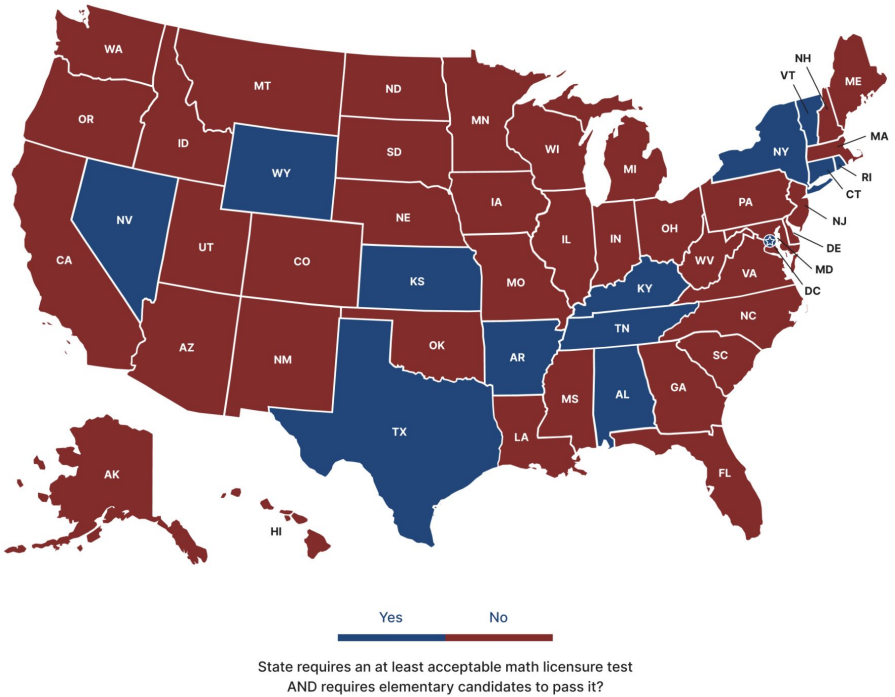
Yet, of the 30 math licensure tests reviewed by NCTQ, **only 10** are acceptable—and **just six** are strong measures of aspiring elementary teachers' math knowledge.

See which licensure tests are acceptable—and which aren't.

A high-quality licensure test is only valuable when all candidates are required to pass it.

Just 13 states

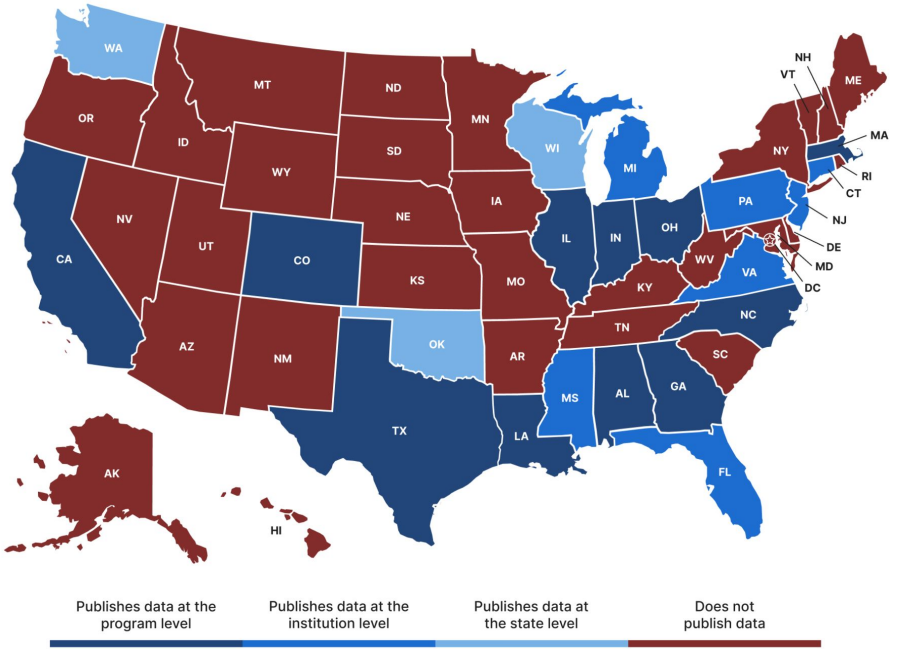
use an at least acceptable licensure test and require that every candidate pass.



Few states publish pass rate data on math licensure tests.

Just 21 states

publish pass rate data, which offers crucial transparency into how well prep programs equip aspiring teachers with essential math knowledge.



Policy Lever 4:

Require districts to select high-quality math curricula and support skillful implementation

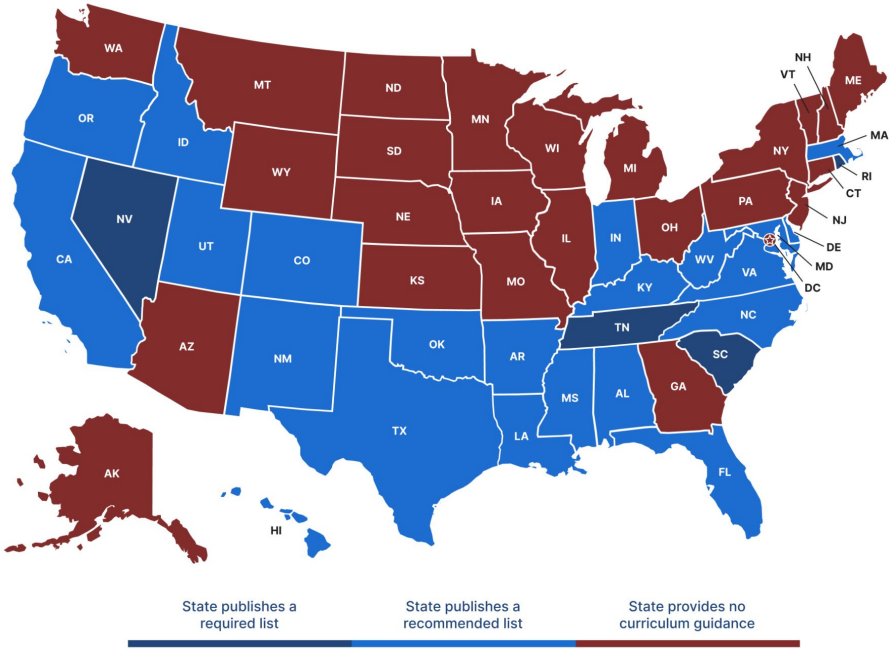
High-quality instructional materials (HQIM) deliver strong outcomes for students and a high return on investment.

- The boost in student learning from using superior curricula can be greater than the advantage of having a teacher with **three years of experience** over a novice teacher.[6]
- Students of color **have less access** to grade-level assignments and high quality curricula.[7]
- Improving the quality of the curriculum was found to be **40 times** more cost effective than reducing class size.[8]

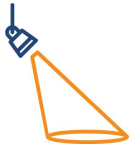
Despite the clear benefits of HQIM, only four states require districts to select high-quality math curriculum materials.

Nearly half of states (24)

do not even offer recommendations on which curricula districts should use.



State Spotlight



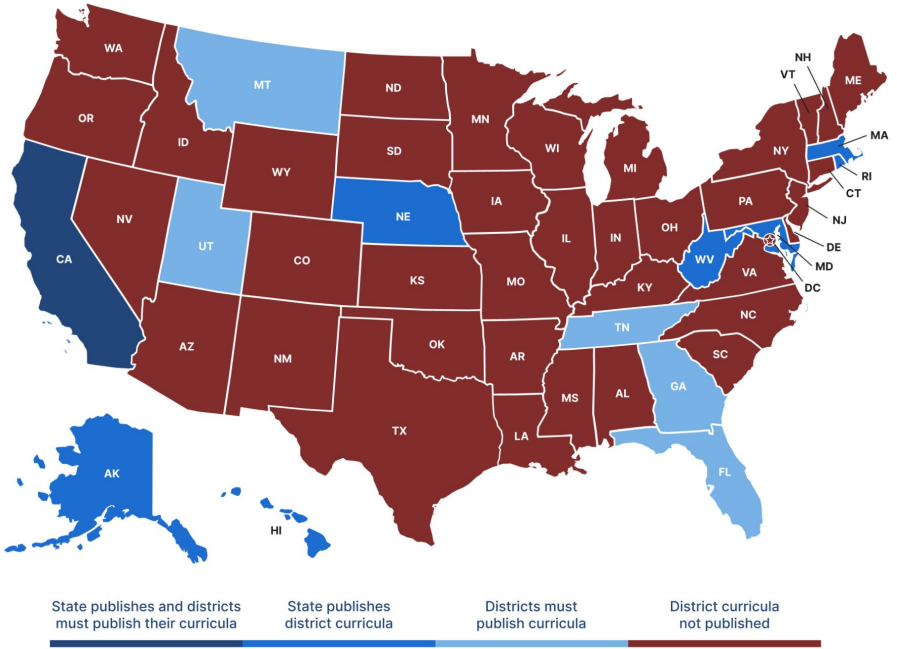
Rhode Island

For each core subject–math, English language arts, and science and technology, Rhode Island law requires state leaders to identify at least five high-quality curricula that align with state academic standards; curriculum frameworks; and the Rhode Island Comprehensive Assessment System (RICAS), the state's student assessment. Districts are required to adopt and implement one of the state-approved curricula. However, to provide flexibility, the state allows districts to apply for a waiver if at least 75% of students meet state assessment expectations and no student subgroups require targeted assistance.

Making district curricula decisions transparent ensures everyone—from policymakers to families—can make informed judgments about the quality of materials in use.

Only 13 states

publish or require districts to publish which curricula they are using.



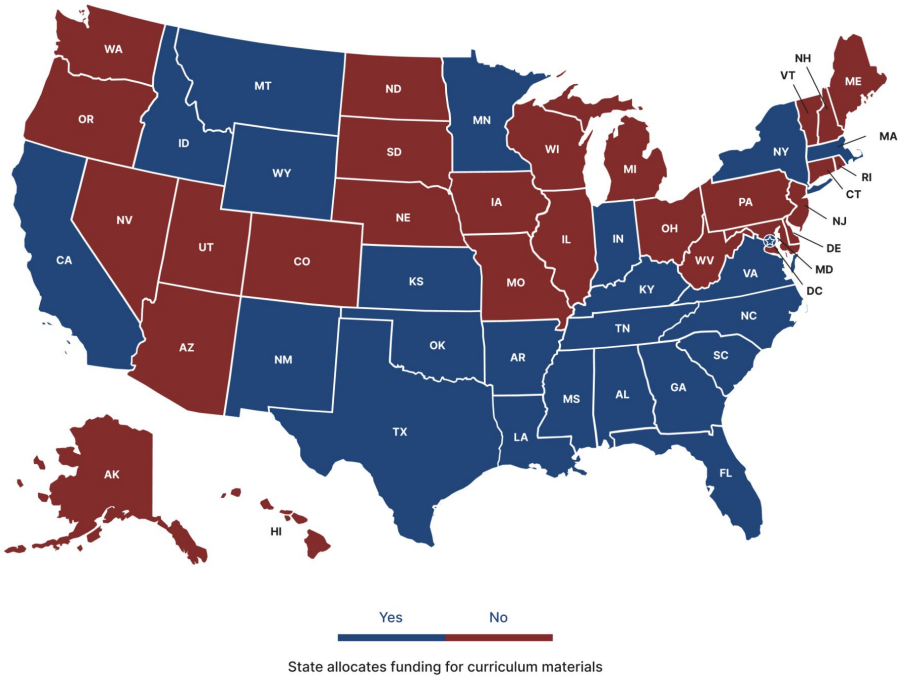
Districts need funding to adopt and transition to higher-quality curricula.

24 states

provide funding for math curriculum materials, either by offering funds to all districts or through grants to some.

Just 2 states

(South Carolina and **Tennessee**) allocate funds for curriculum to all districts and require them to select materials from an approved list.



Policy Lever 5:

Provide professional learning and ongoing support for teachers to sustain effective math instruction

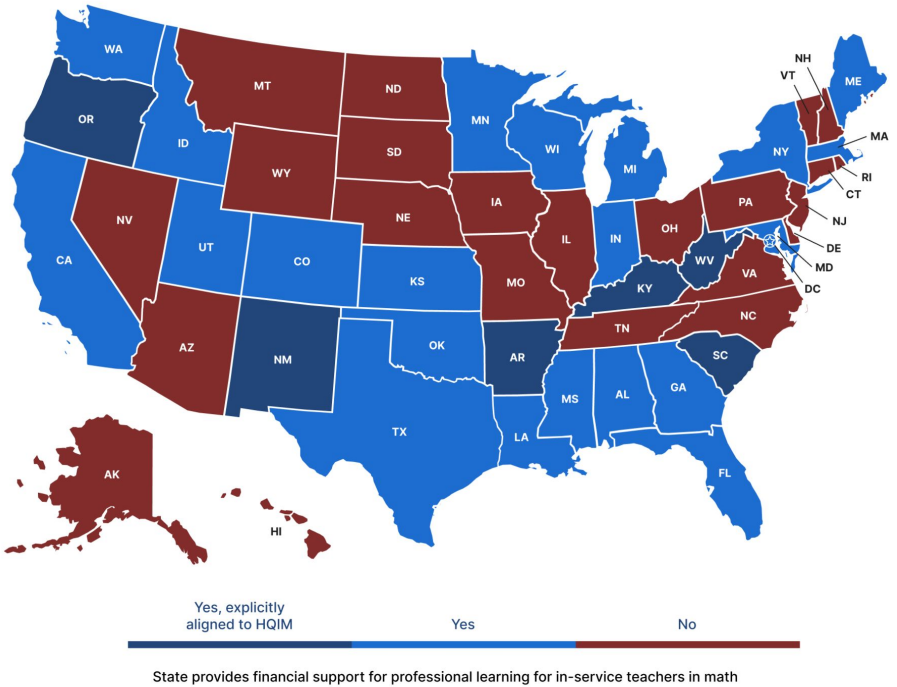
Research confirms that professional learning increases teacher performance and student achievement—especially when aligned to high-quality instructional materials.

- Teachers who receive professional development specifically focused on math and science show **improved performance** on tests measuring their content knowledge and instructional practices in those subjects.[9]
- More importantly, when professional learning leads to better teaching practices, **student achievement increases.**[10]
- **Nearly 60%** of the potential impact of adopting high-quality curricula depends on teachers effectively adapting their instructional practices to align with those materials.[11]

All teachers need ongoing, high-quality professional learning aligned to high-quality instructional materials to build their confidence and ability to support student success in math.

28 states

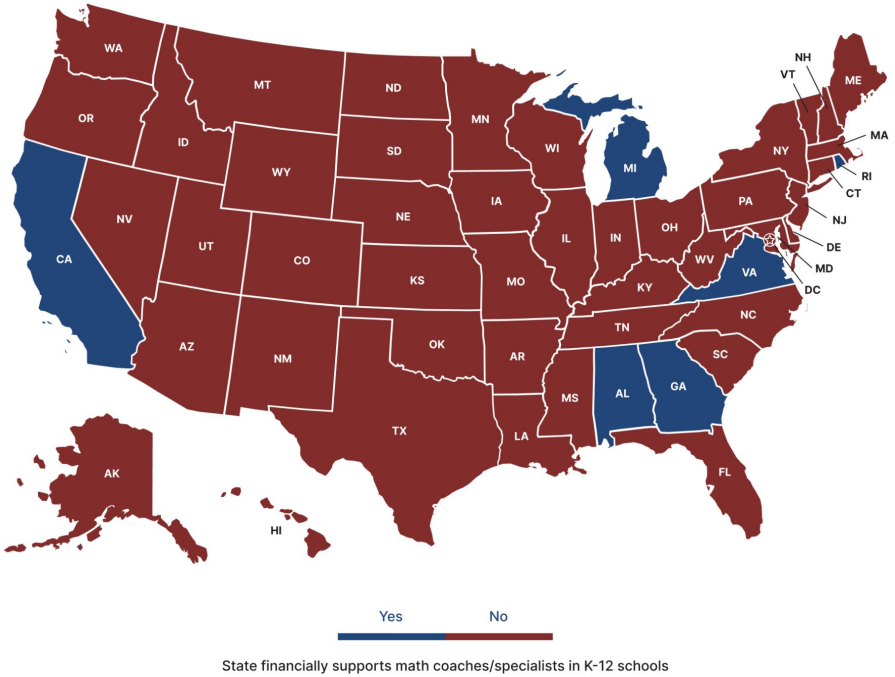
provide funding for professional learning for in-service teachers in math and **only 6** explicitly align these opportunities with HQIM implementation.



Few states fund math coaches or specialists, despite strong evidence that coaching can boost teacher effectiveness as much as 5 to 10 years of experience.[11]

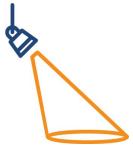
Only 6 states

financially support math coaches/specialists in K-12 schools, and **just four states** provide funding for both professional learning and coaching (**Alabama**, **California**, **Georgia** and **Michigan**).



State financially supports math coaches/specialists in K-12 schools

State Spotlight



Alabama

Alabama's Numeracy Act mandates that every public K–5 school receives at least one math coach. The act explicitly tasks coaches with improving Tier 1 instruction, collaborating with school administrators to build and implement a strategic plan to improve student achievement, facilitating schoolwide professional learning, supporting implementation of HQIM in math, and more.

Conclusion & Recommendations

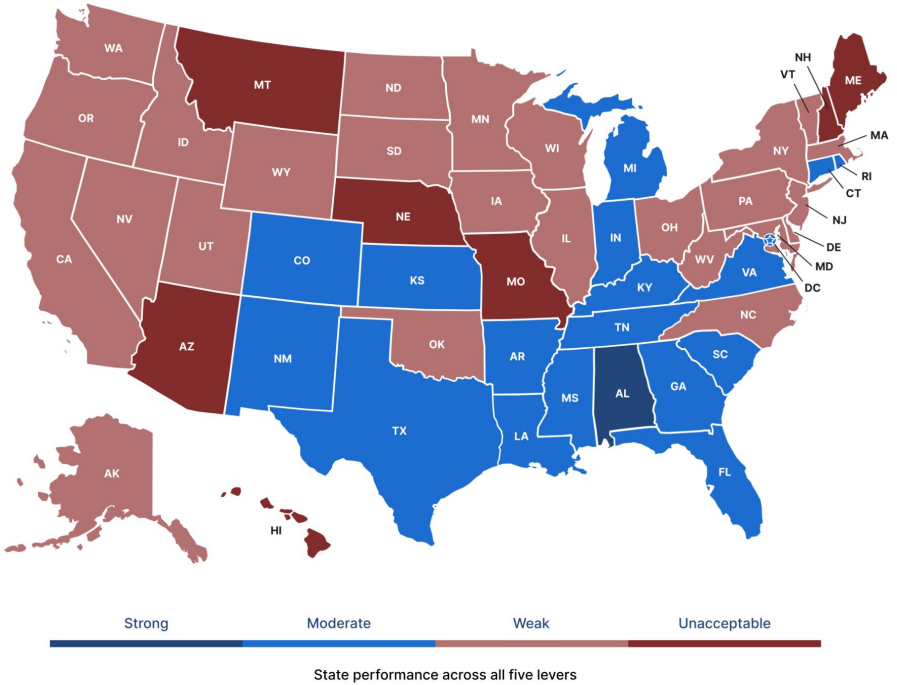
Together, these five policy levers can elevate teacher effectiveness, drive better student outcomes, and build a lasting foundation for high-quality math instruction.

Only one state

(**Alabama**) earned a Strong rating, taking a comprehensive, coherent approach across all five policy areas.

Seven states

earned scores of Unacceptable: **Arizona**, **Hawaii**, **Maine**, **Missouri**, **Montana**, **Nebraska**, and **New Hampshire**.



State performance across all five levers

Recommendations

What actions can state leaders take to strengthen math instruction?

✔ **Policy Lever 1: Set specific, detailed math standards for teacher preparation programs**

- Set specific, detailed math content standards for elementary teacher preparation programs for all four core math content topics (numbers and operations, algebraic thinking, geometry and measurement, and data analysis and probability).
- Include math-specific pedagogy coursework in teacher preparation standards to ensure that aspiring teachers learn how to translate their content expertise into effective instruction.
- Encourage elementary teacher preparation programs to prioritize math courses designed for educators over traditional non-teacher math courses.

✔ **Policy Lever 2: Review teacher preparation programs to ensure they are providing robust math instruction**

- Conduct robust, state-led program reviews to hold programs accountable for implementing effective math content and pedagogy.
- Include a review of syllabi and coursework as part of the review process to assess whether programs properly address math standards in aspiring teachers' preparation.
- Include math experts as program reviewers, including for on-site reviews.
- Review and use math licensure test pass rate data to assess whether preparation programs sufficiently prepare aspiring teachers in mathematics content.

Recommendations

What actions can state leaders take to strengthen math instruction?

✔ **Policy Lever 3: Adopt a strong elementary math licensure test**

- Implement an at least acceptable math licensure test.
- Require all elementary candidates to pass a math licensure test.
- Publish math licensure pass rate data, particularly first-time pass rate data.

✔ **Policy Lever 4: Require districts to select high-quality math curricula and support its implementation**

- Require districts to adopt and implement high-quality math instructional materials.
- Provide guidance on how to select high-quality instructional materials.
- Collect and publish data on the curricula districts are using.
- Allocate funds to help districts transition to and implement new curricula.

✔ **Policy Lever 5: Provide professional learning and ongoing support for teachers to sustain effective math instruction**

- Ensure all elementary teachers have access to high-quality professional learning in math instruction, aligned with the skillful use of high-quality instructional materials.
- Provide districts with funds to support hiring math coaches and specialists.
- Conduct robust, ongoing evaluation of professional learning.

State Spotlight: Alabama

1. **Alabama passed a comprehensive Numeracy Act in 2022.**
2. **Since 2023, the state has been working to place at least one math coach in every K-5 public school.**
3. **The state developed ongoing partnerships with statewide organizations to train every math coach.**

Learn more about Alabama's approach

> "You can't improve math outcomes by focusing on just one piece. Real progress happens when your standards, assessments, instructional materials, coaching, and teacher preparation all point in the same direction. Alignment isn't the finish line—it's the starting point."

Dr. Eric Mackey
State Superintendent, Alabama State Department of Education

State Spotlight: Kentucky

1. **The Kentucky Numeracy Counts Act, passed in 2024, represents a comprehensive statewide investment in math education.**

2. **Funded 40 districts with $70,000 grants to purchase high-quality instructional materials or HQIM-aligned professional learning**

3. **The state is partnering with statewide organizations to fund math teacher academies to give teachers access to research-based best practices.**

Learn more about Kentucky's approach

“

The Numeracy Act is not just an education bill. It's a workforce development bill. It's an economic development bill. If our children aren't competent in literacy and numeracy, they'll have a very difficult time navigating the future world that's' coming."

Representative James Tipton
Kentucky

State Spotlight: Louisiana

1. **Since 2012, Louisiana has implemented a robust review process to vet and promote High-Quality Instructional Materials.**

2. **More than 95% of Louisiana schools use HQIM in math and English language arts.**

3. **In 2023, Louisiana passed Act 260, requiring all 4th-8th grade math teachers to complete a 50-hour numeracy course.**

Learn more about Louisiana's approach

“

We expect every teacher to be trained on [high-quality] materials, to have dedicated time to study them, and to receive ongoing professional learning tied to them.”

Jamie Hebert
Director of Math, Louisiana Department of Education

Companion Resources

State Specific Recommendations

Learn more about policies in your state that help or hinder effective math instruction.

View Recommendations

Assessing the Quality of States' Licensure Tests

See which elementary math licensure tests effectively measure candidates' math knowledge.

Learn More

Teacher Prep Review: Solving for Math Success

Discover how well teacher preparation programs equip future educators to deliver effective math instruction in this latest analysis.

Read the Report

Research Summary

Explore the research behind these recommendations.

View Research

Methodology

Dive into the how NCTQ conducted this analysis.

View Methodology

Endnotes

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