

Evidence-based Math Education & State Actions to Strengthen Outcomes

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Why States are Investing in Mathematics



Math proficiency is linked to:

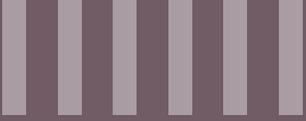
- Higher graduation rates
- College participation
- Workforce readiness

States control key levers for improvement:

- Standards and assessments
- Funding and accountability
- Teacher preparation and support

National Math Trends

- National math proficiency has declined or stagnated on National Assessment of Educational Progress (NAEP)
- Declines are most pronounced among:
 - Median-performing students
 - Lower-performing students
- Nationally, only **about 28% of 8th graders are proficient** in math
- Math proficiency is a key predictor of college and career success



Evidence-based Math Instruction



Evidence-based Materials

Evidence-based instructional materials (EBIM) are educational resources, curricula, and tools rigorously tested through research and peer-reviewed studies to be effective in improving student learning outcomes.

WWC Level of Evidence	ESSA Tier of Evidence	Study Design	Results of the Study	Finding from Related Studies	Sample Size and Setting	Match
 STRONG	 Tier 1 STRONG	Well-designed and implemented experimental study, meets WWC standards <i>without</i> reservations	Statistically significant positive effect on a relevant outcome	No strong negative findings from experimental or quasi-experimental studies	At least 350 participants, conducted in more than one school district	Similar population AND setting to your school
 MODERATE	 Tier 2 MODERATE	Well-designed and implemented quasi-experimental study, meets WWC standards <i>with</i> reservations	Statistically significant positive effect on a relevant outcome	No strong negative findings from experimental or quasi-experimental studies	At least 350 participants, conducted in more than one school district	Similar population OR setting to your school
 MINIMAL	 Tier 3 PROMISING	Well-designed and implemented correlational study, statistically controls for selection bias	Statistically significant positive effect on a relevant outcome	No strong negative findings from experimental or quasi-experimental studies		
	 Tier 4 HAS RATIONALE	Well-defined logic model based on rigorous research	An effort to study the effects of the intervention is planned or currently underway			

Modified from [ESSA Tiers of Evidence: What You Need to Know](#)

Evidence-based Instructional Practices

National Center for Education Statistics – REL Central (June 2024)

To help students ...

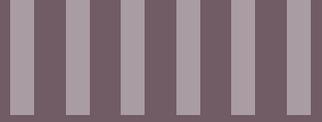
- **Make sense of problems and persevere in solving them:** teachers should emphasize multiple solution strategies and model how to reflect on which strategies are appropriate for certain situations.
- **Model with mathematics:** teachers could use visual representations (such as number lines, word problems, arrays, strip diagrams, and manipulatives) to convey mathematical ideas and concepts.

Evidence-based Instructional Practices

National Center for Education Statistics – REL Central (June 2024)

To help students ...

- **Attend to precision:** teachers should use and support students in using clear, concise math language to convey mathematical vocabulary and concepts.
- **Look for and make use of structure:** teach students to recognize common underlying structures in various problems and how to determine appropriate solutions for each.
- **Express regularity in repeated reasoning:** teachers should devote a portion of class to practicing procedures, daily.

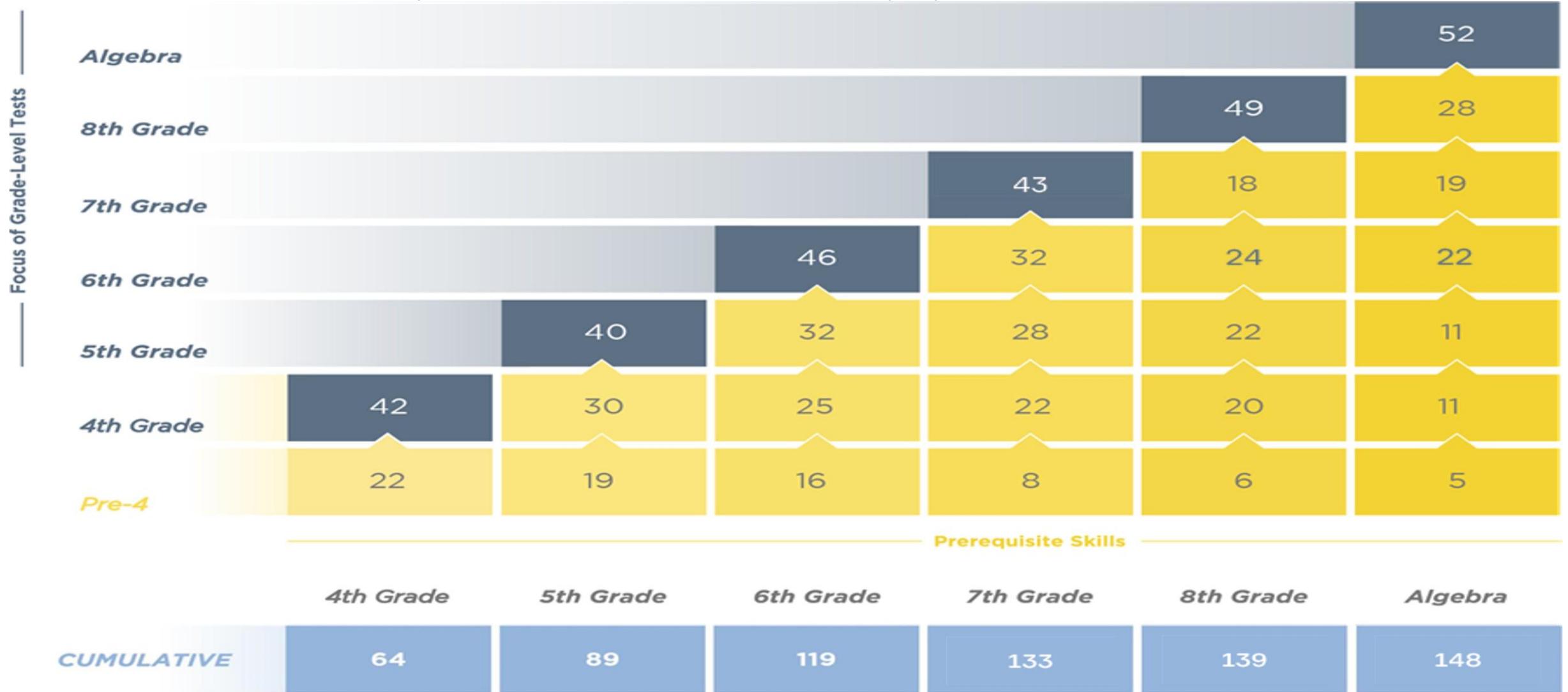


How We Learn Mathematics



Mathematics Learning is Cumulative

Students must master a sequence of foundational skills to be prepared for future content in mathematics.



Policies Should Consider Math Learning Trajectories

Assessment Quality Matters Greatly

Personalized and Coherent Learning Pathways

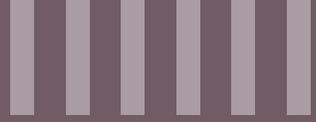
- Being prepared for **Algebra 1 by the end of 8th grade** is a key predictor of a student's future academic and workforce success. But the cumulative nature of learning math means we must keep our eye on student learning trajectory in every year along the way.

Limitations of “Grade-Level Only” Instruction

- Traditional instruction typically focuses only on age-based grade level content — but students often have skill gaps spanning multiple years.

High-quality Assessments are Crucial

- It is important to have sophisticated assessments that can identify key missing skills
- This allows for accelerated and targeted intervention, which helps students catch up and keep up by specifically addressing the missing skills relevant to Algebra 1, not every missing skill.



Early Math is the Foundation



Importance of Early Numeracy Support

Early numeracy (Pre-K–Grade 3) predicts later success in:

- Math
- Reading
- Overall academic outcomes
- College attendance

Many students enter kindergarten without foundational math skills.

- In 2022, over 30% of 3- to 5-year-olds were “off track” in both pre-literacy and math skills.

Early Math: State Actions



Utah – K-3 Benchmark Assessments (2020)

- Requires the development of a statewide K-3 mathematics benchmark assessment, approved by the state board.
- The assessment is to be administered three (3) times per year; optional for kindergarten, required for grades 1-3.



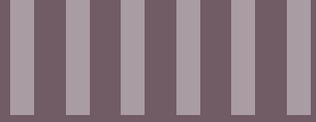
Alabama Numeracy Act (2022)

- Created an Office of Mathematics Improvement
- Requires the use of evidence-based math instruction and materials.
- Provides instructional coaches in all K-5 schools.
- Creates new accountability standards for schools.



Mississippi Beginnings (2022)

- The Mississippi Beginnings 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.**



Personalized Pathways: State Actions





North Dakota SB 2213 (2025):

Creates a pilot program to implement a math tool with three main components:

1. Provide teachers with data through a comprehensive **universal math screener**.
2. 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.
3. Finally, it must give teachers access to supplemental programs to implement the learning plan.



Virginia FY26 Budget:

Requires the DoE to collaborate with school boards and division superintendents on the implementation of **competency-based and evidence-based mathematics learning**, including;

- Provide recommendations on instructional guides and evidence-based resources.
- Oversee the statewide professional development framework for evidence-based teacher training and facilitate regional professional development networks on improving mathematics.



California's 2023

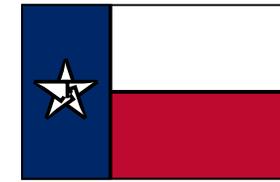
Mathematics Framework:

The framework includes a focus on how students need to master key predecessor skills before they can access grade-level content and recommends **coherence between core and supplemental instruction.**



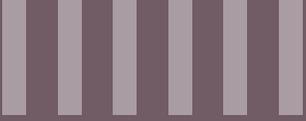
Indiana HB 1634 (2025):

- Requires all students to take a math diagnostic screener and provides for differentiated interventions based on their needs.
- The bill also requires **automatic enrollment in advanced math** courses for middle schoolers who score at certain levels of proficiency on statewide testing.



Texas (2024):

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



Supporting Educators



State Policy Levers to Strengthen Math Instruction

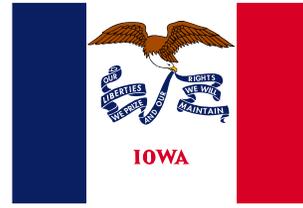
National Council on Teacher Quality

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.



Colorado HB 1231(2023) :

- Requires the DoE to offer free, optional training in evidence-informed math instruction for elementary and secondary educators.
- **Updates teacher preparation and licensure** by requiring evidence-informed math training for elementary, middle school, and secondary math endorsements, and **adds early numeracy to preschool teacher professional development.**



Iowa HB 784 (2025):

- Requires the development of a comprehensive state mathematics plan.
- Requires the state DoE to develop and publish a list of valid and reliable mathematics screeners for K-6, to be used 3X a year.
- Provides **professional development opportunities** for teachers in schools with low proficiency rates.



Kentucky HB 162 (2024):

- Provides funding for professional learning and evidence-based instructional materials in K – 3rd.
- Requires the state DoE to assist school districts by identifying high-quality math curricula, provide coaching and support for teachers, and offer numeracy screeners to help educators identify and address learning needs.

Key Takeaways



- Early math is foundational to long-term success.
- Assessment and curriculum quality matter, evidence-based and alignment between core and supplemental.
- Personalized, multi-grade approaches help students catch up and accelerate.
- Teacher supports are essential for sustained improvement.



Thank you for listening!

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