Math for every learner: HMH's instructional and policy vision for math education

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Math education has the power to unlock every learner's full potential.

Mastery of math skills is a powerful predictor of future opportunities, from college success to career pathways and long-term earning potential. However, across the country, student math achievement is at an all-time low.

According to the 2024 NAEP math assessment, only 39% of fourth-grade students performed at or above proficiency. Even worse, only 28% of eighth-grade students performed at or above proficiency, representing an 8-point drop since 2019. 12th graders' math scores dropped to their lowest levels since 2005. On a global scale, 2023 saw the lowest Trends in International Mathematics and Science Study (TIMSS) scores since 1995.

These gaps are intensified by systemic challenges. Historically, many schools and districts have lacked access to high-quality instructional materials and opportunities for curriculum-based professional learning, with only 44% of materials reviewed in 2022 meeting expectations for standards alignment.[1] At the same time, the underemphasis of math in teacher preparation programs and the large number of new and unlicensed teachers threaten the quality of instructional practices and effective curriculum use.

Furthermore, the way many students and teachers view math is equally concerning. The popular belief that some people are "math people" and others are not limits persistence, confidence, and growth.

As educators, families, and policymakers grapple with how to reverse these troubling trends, the call for bold, evidence-based solutions is growing louder.

At HMH, we believe that addressing these challenges starts with ensuring every student has access to high-quality math instruction, aligned materials, and the support they need to achieve their full potential.

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[1] https://cdn.edreports.org/media/2022/05/EdReports-State-of-the-Instructional-Materials-Market-6.2022.pdf

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Key Pillars

Human-centered, evidence-based, and always improving

1. Every student and teacher is a math person and can find math useful, joyful, and engaging.

2. A human-centered approach to advanced technology and product development enables and extends the valuable work of teachers, the most important school-based factor in student success.

3. Thought partnership and meaningful feedback from students, educators, subject-matter experts, and policymakers are critical to our success.

4. Research-backed, evidence-based math instruction ensures all students have equal opportunities to succeed.

5. The research and evidence of what works to support students is ever evolving and our beliefs, products, and practices evolve accordingly.

Our Commitments

Growth, quality, and support drive our work in math

Transformative student outcomes

We are deeply committed to transformative student outcomes creating deep, lasting, and meaningful change in what students know, can do, and become, not just improving test scores or short-term performance, but fundamentally altering students' life trajectories. We focus on student growth and engagement on the pathway to math excellence.

Support for all learners

We believe every student deserves the opportunity to thrive in a math classroom that honors their unique abilities and needs. HMH's products, services, and assessments equip teachers to differentiate instruction while ensuring all students, including multilingual learners and students with disabilities, can access rigorous, grade-level mathematics.

Evidence-based, efficacious materials

We utilize research to develop math products and determine their efficacy, so our products are not only evidence-based, but also efficacious. We continuously review, revise, and improve our products to reflect the latest evidence and measure success using independent, third-party research and efficacy studies. We quantify the impact of our instructional materials on students' math development and believe state and district policies should evolve to reflect the latest evidence of what is effective in helping students progress academically.

Comprehensive support

We believe math teachers and education leaders thrive with ongoing, high-quality professional learning. Teachers need a full suite of aligned resources—core, supplemental, intervention, assessment, and training—that support student needs and build confidence in math instruction. Leaders need support to implement materials with integrity and guide teachers in adopting new math practices. Professional learning must be collaborative, job-embedded, curriculum-aligned, data-driven, and grounded in evidence-based best practice.

Innovation and insight

We pursue the development of groundbreaking, mission-driven math programs to make teaching and learning more individualized and effective for teachers and students.

Our Instructional Vision

A guide to empowering confident problem solvers

Too often, math instruction is reduced to following rigid rules and finding the right answers. Knowing algorithms and accurately solving problems matter but are insufficient and limiting to the goal of all students being algebra-ready. Procedural fluency, which is the ability to conduct math procedures with speed, accuracy, efficiency and fluency, is foundational to math success and must be grounded in a conceptual understanding of mathematics and combined with a flexible approach, where kids explore ideas and real-world problems, making math useful and empowering for students.

Every student deserves the opportunity to thrive in a math classroom that honors their unique abilities and needs. That starts by supporting perseverance through appropriately increasing challenge and creating space for curiosity, discovery, and joy. Our goal is to help all students experience the wonder of mathematics and grow into confident problem-solvers.

Our math instructional vision aims to put these beliefs into practice, ensuring every student develops the confidence and skills to use math as a tool to understand and shape the world around them. To effectively bring this vision to life, math instruction must:

1. **Establish clear math goals to focus learning.**
   HMH products establish the why, how, and what around the math students are learning. The learning goals set high expectations for all while building understanding along progressions and coherent content strands that are clearly identified and carefully sequenced.

2. **Balance conceptual understanding, procedural skill, and real-world problem solving.**
   To be successful mathematicians, students must build conceptual understanding, procedural skill, and problem-solving acumen. To this end, the structure of lessons, interventions, and assessments allows students to make connections across varied mathematical representations, pursuing solutions through multiple paths. Students use various modalities–discussion, manipulatives, and online learning to make thinking visible, to connect concepts to practice, and to build students' problem-solving skills and efficacy. Students need to be solvers of non-routine, real-world problems and have the fluency with math facts and algorithms to propel them to success with increasingly more challenging math content.

3. **Elicit and strengthen student reasoning.**
   HMH products ask students to explain their thinking through multiple representations of learning. Students are expected to explain verbally and/or in writing, model, and defend their thinking and solution path, as well as listen to others, asking questions and potentially modifying their own approach based on evidence presented. Doing so helps students build their math language, consider different problem-solving strategies, and revise and crystallize their mathematical thinking. Teachers are prompted to use this information to assess student progress toward content mastery and build from their current understanding.

4. **Support purposeful challenge in learning math.**
   Students thrive in math when they're encouraged to persevere through increasingly challenging problems that spark curiosity and deepen understanding. HMH products are designed to support this productive struggle by scaffolding learning in ways that invite students to engage with complex, non-routine tasks, explore multiple strategies, and share their thinking. Teachers are equipped to guide this process through purposeful questioning and rich discussion, enabling academic growth while nurturing students' sense of joy, wonder, and confidence in mathematics.

Our Policy Vision

A guide to removing barriers facing high-quality math instruction

Every student can excel in mathematics when given access to high-quality instruction alongside evidence-based, standards-aligned materials. HMH's products, services, and assessments are built to help teachers differentiate instruction to ensure all students, including multilingual learners and students with disabilities, can access rigorous, grade-level mathematics.

Yet, high-quality instructional materials and a clear instructional vision alone are not enough to equip every learner with the confidence and skills necessary to succeed in math. Policy decisions shape what happens in classrooms every day, influencing access to resources, defining instructional practices, and impacting student outcomes.

To make our instructional vision a reality, we must address several current state policy and legislative barriers, including:

1. **Disconnected adoption and procurement policies** for core materials and supplemental or intervention programs, often resulting in districts and schools selecting materials that aren't designed to work together.
2. **General math professional development** that diverts teachers' time from the math training they need most.
3. **Lack of clear policy guidance for AI integration and use,** which risks undermining instructional coherence and the impact of high-quality instructional materials (HQIM).

Instructional coherence: Improving adoption and procurement policies to better align core, supplemental and intervention materials

In many districts and states, core curricula, supplemental tools (such as those for adaptive practice), and intervention programs are purchased on different timelines and through uncoordinated procurement processes. Each set of materials often has its own approved list, developed separately and without alignment.

As a result, materials are rarely reviewed together, leading to instructional incoherence.

This is especially harmful in mathematics, where concepts are deeply interconnected and build on one another. Misaligned resources introduce inconsistent terminology, instructional models, and problem-solving methods, making it harder for students—especially those who struggle—to catch up or make connections. Effective interventions provide *just-in-time* supports that help students access current grade-level Tier 1 content. This approach, often called “acceleration,” only works when supplemental and intervention materials are tightly aligned with high-quality core curriculum. If interventions focus on disconnected skills or remedial content unrelated to current instruction, students will fall further behind[2].

To solve this problem, states can adopt the following approaches:

1. **Reimagine Adoption Cycles**
   Think outside of the box when it comes to adoption cycle systems and processes so that core and supplemental materials are selected in ways that support coherence.
2. **Support Innovative Review Structures**
   Provide district leaders with sample rubrics and guidance that helps them evaluate materials based on how they work together, including coherence, coverage and progression.
3. **Sync Professional Learning**
   Align professional learning (PL) opportunities so that they integrate both core and supplemental materials, ensuring teachers receive training on why and how to use the materials together.

[2] TNTP. (2021). Accelerate, don’t remediate: Learning acceleration in elementary math (PDF). TNTP. Retrieved from https://tntp.org/wp-content/uploads/2023/02/TNTP_Accelerate_Dont_Remediate_FINAL.pdf

Building teacher expertise: Updating requirements for math professional development

Many states are following the path of successful literacy reforms—which center on structured, science-of-reading professional learning—by mandating PL in mathematics. But unlike reading, where mastering the 26 letters and 44 phonemes is necessary and well-defined, mathematics lacks an agreed-upon, discrete foundational skillset. Math is a web of interrelated domains: number sense, spatial reasoning, algebraic thinking, and more. There's no neat "alphabet" equivalent, making the one-size-fits-all PD approach inherently vague and insufficient as a means of strengthening classroom practice.

Teachers need both deep math content knowledge *and* effective strategies for teaching it. The most effective way to build both is through strong curriculum-based professional learning (CBPL) that is tied directly to the materials teachers use every day. Mandates for stand-alone, content-only PD often pull time away from this kind of integrated, curriculum-aligned learning. Research shows that pairing HQIM and CBPL produces greater improvements in student outcomes than either approach alone[3]. According to a recent RAND study, districts are also eager to connect PD to the curriculum: 81% of districts surveyed reported that "alignment of PL with the math curricula that teachers use was a major consideration when selecting external PL opportunities to support teachers' mathematics instruction."[4] With limited PD time for teachers, states and districts should prioritize the approaches most likely to improve instruction and accelerate student learning at scale.

At HMH, we believe the best way to build teachers' math expertise is alongside support for implementing the curriculum. Math teachers and education leaders thrive when PL is high-quality, ongoing, collaborative, job-embedded, curriculum-aligned, data-driven, and grounded in evidence-based best practice.

To fully support teacher mathematics learning, we recommend:

1. **Curriculum-Based Professional Learning**
   Require content knowledge building PL be anchored in the adopted math curriculum, using real lessons and materials.
2. **Individualized Supports**
   Ensure consistent job-embedded coaching and reflection cycles are included, not just occasional workshops.

[3] Fredston-Hermann, J., & McCormick, M. (2024, April 3). Spotlight on evidence: The role of curriculum-based professional learning in boosting student achievement. Overdeck Family Foundation. https://overdeck.org/news-and-resources/article/spotlight-on-evidence-the-role-of-curriculum-based-professional-learning-in-boosting-student-achievement/ | [4] Steiner, E. D., Covelli, L., Tekkumru-Kisa, M., & Diliberti, M. K. (2025). Prioritizing curriculum-based professional learning for mathematics teachers: District, principal, and teacher perspectives from the American Educator Panels (RR-A 2836-7). RAND Corporation. https://www.rand.org/pubs/research_reports/RRA2836-7.html

AI guidelines and guardrails: Establishing clear policy guidance for AI integration and use

As noted in our *Case for Quality and Coherence in Classroom AI*[5] white paper, the AI revolution isn't coming to classrooms—it's already here. Teacher use of generative AI has quintupled in recent years, with most teachers using tools that promise to personalize instruction, generate tailored materials, and reduce administrative burdens. But a flood of one-off, standalone AI solutions—often disconnected from any curriculum or learning platform—risks undoing years of progress toward coherent curriculum and high-quality instructional materials. In this moment, districts face pivotal decisions about how best to leverage generative AI. This is an opportunity to choose tools that put students' learning first. This means they are aligned with high-quality instructional materials informed by real insights on student needs and progress, and tested and trusted for privacy and security. The most effective solutions will also be integrated to simplify teachers' work by bringing together student progress insights, material generation, and instructional guidance all in one place.

At HMH, we believe that with thoughtful choices, schools can put these extraordinarily powerful tools in the hands of teachers while advancing, rather than compromising, three non-negotiables:

- **Coherent, high-quality curriculum:** Any materials or guidance AI offers should be tightly connected to strong, standards-aligned curriculum and assessments.
- **Insights on student learning:** Any instructional materials and guidance generated by AI should also be informed by insights on student progress drawn from analysis of learning data.
- **Privacy and security:** Any AI system must provide uncompromising protection of student data.

To ensure the responsible integration of AI in mathematics instruction, state education agencies (SEAs) should develop policy guidance that supports coherent, human-centered, and instructionally sound implementation aligned with HQIM. SEAs should:

1. **Set a Clear Vision and Goals for AI in Math Instruction**
   Define how AI tools should complement, not replace, core instructional practices. Emphasize that AI should support students' conceptual understanding, procedural fluency, and problem-solving in ways that are consistent with HQIM-aligned practices.
2. **Establish Use Criteria Based on HQIM Standards**
   Develop vetting guidelines for AI-powered tools to ensure alignment with state-approved HQIM rubrics. AI tools should:
   - Reinforce mathematical reasoning and standards-aligned instruction,
   - Avoid fragmenting the learning experience into isolated skills,
   - Support student discourse and formative assessment practices embedded in HQIM.
3. **Maintain Human Oversight and Educator Agency**
   Ensure any AI integration supports educator judgment. Require that AI-generated insights or content be reviewed and adapted by educators, preserving their role as instructional decision-makers.
4. **Incorporate Data and Accessibility Safeguards**
   Require AI tools and AI-generated materials to meet accessibility standards—ensuring the practice problems, learning pathways, and feedback they produce are usable by all students, including those with disabilities. Provide clear guidance on how to protect student data and ensure student privacy.
5. **Provide Professional Learning and HQIM-Connected Use Cases**
   Support educators with targeted professional development that explores how AI can:
   - Automate low-leverage tasks (e.g., generating practice sets aligned with HQIM),
   - Enhance data analysis from formative assessments embedded in HQIM,
   - Tailor scaffolds for students using AI in ways that respect curricular coherence.

[5] Houghton Mifflin Harcourt. (2025). *Decision Time: The case for quality and coherence in classroom AI* [White paper]. HMH Education Company.

Improving Policy and Practice

Creating lasting improvements in mathematics education requires effective classroom instruction, high-quality materials, and a coordinated approach that aligns curriculum, professional learning, assessment, and policy.

HMH is committed to providing materials, training, and supports that enable students to thrive in mathematics. As we continue to evolve our products to meet the moment, we look forward to partnering with advocacy organizations and states that share this commitment. States can leverage their pivotal role in shaping mathematics instruction by setting policy conditions that promote coherence and instructional quality.

While many are eager to mirror the success of structured literacy reforms, it is important to account for the complexity and unique nature of math, and to pursue policies that specifically support math learning.

Key actions include promoting aligned materials, designing coherent implementation timelines, providing targeted professional learning, and developing strong AI policies. Together, these strategies can create the conditions for meaningful, sustained improvements in math outcomes for all students.