

Wise Investments, Big Returns: Prioritizing Teachers for Districtwide Mathematics Success

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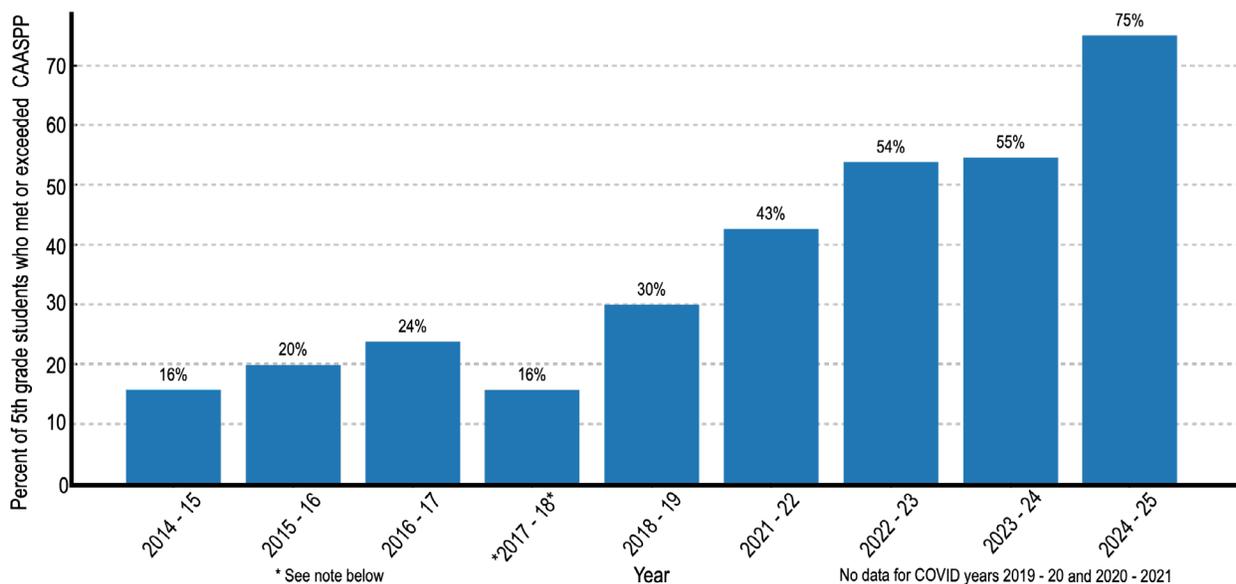


Introduction

Researchers and teachers alike recognize that students need a mathematics approach grounded in reasoning and problem solving, but implementing such an approach can be challenging for teachers, and leaders often report that they do not know how to help teachers learn reasoning-based practices. For both reasons, few examples exist of widespread innovation in mathematics across an entire school district. Despite the challenges that often inhibit change, this short paper presents a powerful example of district math leadership in action: the implementation of research-based practices and the learning gains that resulted from a long-term commitment to students' mathematical futures.

It was approximately ten years ago when the [youcubed](#) team began working with Healdsburg Unified School District – a small TK-12 district in Sonoma County, California. I (EF) was their Director of Curriculum & Instruction at the time. I attended a [youcubed](#) leadership summit and learned about the research in mathematics education that highlights the importance of a “mathematical mindset” approach. In this approach, teachers believe in the potential of all their students and communicate mindset and growth messages that affirm students' potential. Importantly, they also share mathematics tasks that are sufficiently open for students to see how they can learn and grow, thereby making the mindset messages meaningful. This entails rich tasks in which students collaborate, reason, visualize, and explore their own ideas.

At the time we started working together, mathematics achievement was low across the district. Only 16% of 5th graders were proficient in mathematics. In the most recent state testing, 75% of fifth graders scored at proficient levels. The largest increase in student achievement occurred in the elementary grades, largely due to teachers' willingness to make fundamental and lasting changes in their instruction but every grade level, K-12, demonstrated at least a 10% increase in student achievement (CAASPP, 2025).



Mathematics Proficiency Change in 5th grade in HES from 2014/15 to 2024/25

** The dip in CAASPP scores during the 2017–18 school year can likely be attributed to the significant disruption caused by the Tubbs Fire in October 2017. At the time, it was the most destructive wildfire in California’s history, destroying more than 7,000 structures and claiming dozens of lives across Sonoma County. In the aftermath of the fire, HUSD schools were closed for several weeks due to evacuation orders and hazardous smoke conditions, creating substantial interruptions to teaching and learning during the school year.*

This short paper describes the central aspects of the journey undertaken by the teachers and leaders in Healdsburg as they transitioned to a mathematical mindset approach. These changes were achieved in a district in which 67% of students are socioeconomically disadvantaged, and 60% of entering kindergarteners are English Language Learners.

1) A Focus on Teacher Learning

Many school districts allocate valuable funds to new curricula, often choosing different sets of teaching materials every few years. However, quantitative studies of educational initiatives show that the most significant impact on student achievement in mathematics—both before and after accounting for student poverty and language status—is teacher learning (Darling-Hammond, 2000). If teachers have never had the chance to learn effective teaching methods and are using techniques they observed when they were students—what Lortie (1975) called the “apprenticeship of observation” (Lortie, 1975, p. 61)—then new curriculum materials will have little effect on student learning. After attending a [youcubed workshop](#) that presented research on student and teacher learning and invited participants to experience a mathematical mindset approach firsthand, I (EF) recognized the importance of instructional practices aligned with research and decided to invest in teacher development.

2) Learning in Teams about a Mathematical Mindset Approach

Over the next few years, nearly all elementary teachers in Healdsburg attended 2-day professional development [workshops at youcubed](#), where they learned to implement a “mathematical mindset” approach. The teachers learned the research underpinning the approach and worked on rich mathematical tasks themselves to experience it as learners. Teachers also watched videos of other teachers using a mathematical mindset approach to learn important pedagogical moves. Attending the professional development in teams enabled teachers to continue conversations about the approach with colleagues back in the district. This helped establish a common vision and a shared language for talking about their mathematics teaching and their students’ learning. Additionally, many of the teachers took youcubed’s [“How to Learn Math” online course](#) which provided a shared learning experience to boost their confidence in mathematics and to better understand research-based practices they could implement with their students.

Alongside their broader professional learning, the elementary teachers formed a voluntary book study on Dr Boaler’s book: [Mathematical Mindsets: Unleashing Students’ Potential through Creative Math, Inspiring Messages and Innovative Teaching](#) (Boaler, 2015, 2022). Meeting after school during scheduled collaboration and professional learning time, the group read one chapter at a time and used their discussions to turn key ideas into concrete changes in daily instruction—planning lesson moves, testing strategies between meetings, and reflecting on student evidence to refine their practice.

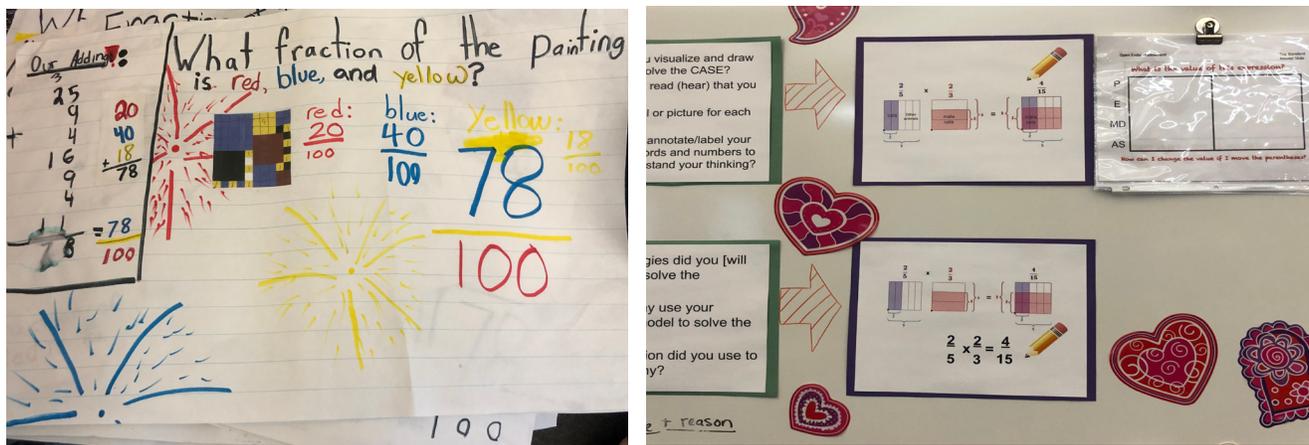
Key instructional takeaways from the book study included:

- **Multiple avenues for explaining thinking:** Building routine opportunities for students to communicate mathematical reasoning in oral, written, visual, and representational forms.
- **Emphasizing reflection over performance:** Using mistakes and revisions as learning tools, and prioritizing student reflection and sense-making—especially during formative learning experiences.
- **Inquiry-based, student-centered learning:** Increasing tasks where students ask questions, select tools and representations, and investigate within the focus of Common Core State Standards.
- **Depth over speed and procedures:** Shifting from “covering” content to developing conceptual understanding, flexible strategies, and enduring problem-solving habits.
- **Connecting math to the world through modeling:** Designing learning experiences that ask students to interpret situations, make assumptions, represent relationships, and justify solutions using real contexts.
- **Strengthening mathematical discourse across classrooms:** Establishing consistent discourse routines and shared language so students engage in meaningful mathematical conversation within and across grade levels.

3) Establishing a Mindset Classroom Culture

All classes now start the school year with youcubed’s [“week of inspirational maths”](#) tasks and mindset videos for students. These tasks and videos establish a classroom culture in which all students know they can learn mathematics to high levels and come to see mathematics as a subject rich in beauty and connections.

The teachers reinforce these ideas every month by inviting students to learn mathematics through a rich task. District funds were used to purchase all elementary teachers' books from the [K-8 Mindset Mathematics series](#), and teachers agreed to begin each month with one of the tasks. The tasks in the books teach connected grade-level standards conceptually and deeply. Rather than saving rich tasks for students to complete after they had worked through short questions in textbooks, teachers used these tasks to introduce ideas that students could learn deeply before they worked through textbook exercises. Students developed a conceptual understanding of the ideas, which served as a foundation for all their learning.



Examples of student work on walls.

4) Parents learned about a Mathematical Mindset approach

When leading districtwide shifts in mathematics, I (EF) recognized that sustainable change depends on engaging parents and families—early, transparently, and with respect for their experiences. Families are often concerned about new approaches to teaching foundational skills, such as multiplication facts, when instruction differs from their own experiences. In many cases, these concerns are rooted in parents' own negative experiences as math learners. Yet parents and caregivers can also become powerful allies when they are provided with clear, current information about what high-quality math teaching entails and why it is important.

To foster shared understanding, we hosted a community-wide parent evening where Professor Boaler presented research on the “mathematical mindset” approach and shared concrete classroom examples of how it is implemented. This event became a key starting point: it provided families with the evidence and language to interpret what they saw in homework and classroom activities, and it reshaped the ideas of productive struggle, discourse, and multiple strategies as signs of rigorous learning—not confusion or lack of instruction. Many parents bought [Mathematical Mindsets](#) and started talking with each other about how they wished their own math education had offered the same opportunities their children were now experiencing. Besides the Mathematical Mindsets book study, the district hosted annual bilingual Math Nights to strengthen family partnerships and generate excitement about mathematics. Teachers led hands-on learning stations where students and families explored engaging tasks together, experienced what student-centered math looks like, and learned simple questioning strategies that encourage reasoning and perseverance. These evenings also

helped change common narratives—especially the familiar “I’m not good at math” message many adults carry from their own schooling—by showing families that math can be enjoyable, accessible, and something you improve at through practice and curiosity. Families left equipped with practical tools to continue learning at home, including manipulatives and game materials like dice, decks of cards, and easy-to-use activities that make math practice feel like play. Over time, the narrative shifted. Rather than pushing back against the changes, parents helped reinforce them—encouraging persistence, valuing reasoning over speed, and supporting teachers and students as partners in the district’s transformation.

5) Building Structural Support by Investing in and Developing STEM specialists

The district team researched successful mathematics approaches in other districts and was particularly interested in the Navigator Schools model, which uses STEM and humanities specialists in elementary schools. HUSD piloted a specialist approach in grades 1–5, offering teachers the opportunity to teach STEM or humanities exclusively so that each class was supported by two teachers. This model does not require any increase in teachers, as teachers are with each class only half of the time. After the first year, the district reverted grades 1–2 to a one teacher per classroom, largely because many teachers believed the youngest students benefited from a single teacher. The district retained the specialist model for grades 3–5.

Now all 3-5th graders have two teachers at different times of the day: a STEM specialist and a humanities specialist. The teachers report that they value specialization and now have more time to plan engaging lessons. One significant advantage of the specialization approach is that all Grade 3–5 mathematics classes are now taught by teachers who love mathematics.

An extra benefit of the STEM/Humanities specialist model was improved integration across different content areas. Math instruction could more naturally connect to science and engineering practices. Teachers could incorporate mathematical reasoning into projects and real-world situations. This specialization helped teachers feel they had more—not less—time for deep learning, and it allowed teachers to strengthen mathematics without cutting into time for science, history, or other subjects.

6) Diving Deeply into Mathematics

In addition to supporting teachers in developing a mathematical mindset—based on research—the Healdsburg team launched a multi-year plan to boost teachers’ confidence and skills in teaching a challenging, Common Core–aligned math program. We started with an honest reality: many educators, across grade levels, have not had the chance in their own schooling or training to experience math as a subject rooted in reasoning, meaning-making, and real-world problem-solving. Elementary teachers are generalists who may have taken only one or two college math courses. Even middle and high school teachers with math degrees often describe learning math mainly through procedures and memorization, with few opportunities to deeply understand the “why” behind ideas or to teach in ways that promote conceptual understanding, discussion, and application.

While teachers explored Mathematical Mindsets and [youcubed](#) resources, the district simultaneously invested in creating the conditions necessary for teachers to build content knowledge and instructional coherence. By grade level, teachers received release time—at least one day per month—

and additional paid days (ranging from five to ten during the summer) to study the Common Core State Standards together, unpack the progressions, and collaboratively develop both horizontal and vertical scope and sequence. Although HUSD had adopted Everyday Mathematics as its elementary core curriculum and College Preparatory Math (CPM) for grades 6-12, Erin and the teacher teams were clear that a high-quality math experience could not rely solely on a textbook approach. The curriculum needed to be standards-driven, responsive to student thinking, and enriched with tasks and routines that foster reasoning and sense-making.

That investment provided protected time for collaborative planning, shared analysis of student work, and ongoing data cycles. Teachers used this time to deepen their understanding not only of the standards in their own grade but also those in the grades immediately before and after—strengthening coherence across classrooms and supporting smoother learning progressions for students. With a stronger standards foundation, teams designed richer units and lessons by combining Everyday Mathematics and CPM with [youcubed tasks](#) and routines, along with targeted technology tools such as ST Math, Kahn Academy, ALEKS, Struggly, and Zearn.

To keep instruction responsive, teachers also established a consistent rhythm of short common formative checks—often exit tickets or brief 2–4 question mini-quizzes—that are used to identify patterns in student thinking. Teachers use the resulting information to plan small group supports, adjust upcoming lessons, and refine pacing and emphasis within the scope and sequence. Over time, the message remained clear: student learning improves when adult learning is protected and prioritized. By investing in teacher knowledge, collaboration, and shared responsibility for standards-aligned planning, the district created the conditions for lasting instructional change across grade levels.

7) Leveraging Technology Interventions

In the early years of the math innovation plan, the district adopted [ST Math](#) to strengthen differentiation and ensure that every student had access to appropriately challenging learning, both as targeted support for students below grade level and as an extension for students ready for above-grade-level math. In later years, teachers also incorporated [Struggly](#) to further enrich and individualize instruction, using the tools to diagnose student needs, provide just-in-time practice and build confidence through consistent feedback and progress monitoring. This use of educational technology was not an “add-on” or stand-alone intervention. Instead, it was embedded within a blended learning station-rotation model. During the math block, students alternated between whole-class learning and small-group centers, rotating through purposeful stations that typically included (1) teacher led-instruction based on student work and formative data, (2) independent software-based practice aligned to the day’s learning target, and (3) collaborative problem-solving stations where students work together on a rich task, problem set or investigation aligned to the standard. The teachers employed “[pedagogical variety](#)” (Boaler, 2025), knowing that different teaching approaches offer different opportunities to students. Because each station was intentionally aligned - rather than “random skill practice” - the model increased the amount of targeted teaching students received, created daily opportunities for discourse and reasoning, and allowed teachers to personalize support while keeping all students moving toward grade-level expectations.

Conclusion

When Healdsburg Unified began implementing a Mathematical Mindset approach, only 16% of 5th graders were proficient in mathematics. After the district invested in teacher learning and supported teachers with high-quality resources and tasks, students' proficiency increased significantly across all grade levels. The fifth-grade teachers were the teachers who followed the approach most consistently, and they achieved the greatest improvements. In the most recent round of state testing, 75% of fifth graders scored at the proficient level. These impressive results were achieved in a district in which 76% of elementary students are socioeconomically disadvantaged.

Districts might be tempted to pursue similar improvements by adopting one or two of the actions Healdsburg took to improve higher mathematics achievement and interest, but the real progress likely came from the comprehensive strategies the district leaders implemented to help teachers and parents learn the approach effectively. These kinds of changes are achievable to any school district. Notably the Healdsburg leaders did not spend their district funds on a new curriculum. Many districts change their curriculum every seven years without investing in teacher learning and do not see changes in outcomes. Instead, the Healdsburg leaders recognized that for teachers to change their teaching approach they need to be supported with time and with high quality professional learning, accompanied by parent and family learning.

While this important work was happening, the Healdsburg community faced an extraordinary series of challenges affecting students, families, and schools. The region was repeatedly impacted by major natural disasters—including the 2017 Tubbs Fire, 2018 Camp Fire, PG&E public safety power shutoffs, 2019 Russian River flooding, the 2019 Kincade Fire, the 2020 Walbridge and Glass fires, and localized flooding in 2023—leading to school closures, disrupted learning, and increased social-emotional needs related to displacement, housing insecurity, poor air quality, and ongoing stress and uncertainty. Alongside these events, the COVID-19 pandemic caused significant learning loss and constant changes in instruction, from distance learning to evolving health and safety protocols, further challenging students' academic progress and well-being. Throughout it all, HUSD responded with resilience and purpose—strengthening supports, adapting instruction, and maintaining focus on teacher and student learning—resulting in impressive student achievement gains.

Learning mathematics well matters – strong math skills have consistently been shown to predict students' life chances and future employment (OECD, 2019). Some people believe that high, district wide achievement is an impossible goal, as “math is just hard”. What this powerful case shows is that transformative change is possible when a mathematical mindset approach is thoughtfully applied. In the classrooms of Healdsburg students have started to see themselves as capable learners, they enjoy mathematics, and they recognize mathematical ideas in the world around them — changes that empower students for their futures as mathematically confident and successful citizens (Boaler & Dieckmann, 2026).

For more information on the work in Healdsburg, contact Erin Fender, efender@scoe.org, who now works at Sonoma’s County Office, or Tiffany Dougherty, tdougherty@husd.com, the current Director of Curriculum & Instruction in the district. For more information on the youcubed professional learning and other supports provided by youcubed, contact PDinfo@youcubed.org.

Number of students tested for each year of CAASPP.

Year	Number of students tested for CAASPP
2014 - 2015	68
2015 - 2016	66
2016 - 2017	50
2017 - 2018	42
2018 - 2019	43
2021 - 2022	89
2022 - 2023	65
2023 - 2024	64
2024 - 2025	63

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