

Math Mindset: Transforming the Middle School Math Experience

Middle school math provides a foundation for student success in advanced math and introduces students to key concepts, such as fractions and computational skills.^{1,2} Effective engagement strategies can help students connect to math content in meaningful ways and build skills for more advanced math in high school and college. To explore ways to accelerate math engagement and performance for middle school learners, [Regional Educational Laboratory \(REL\) Midwest](#) created a documentary featuring evidence-based math engagement strategies that are being implemented at Jonathan Burr Elementary School in Chicago, IL.

"Life is problem solving. The best definition of a good problem solver is someone who knows what to do when they don't know what to do. That's what we want kids to be able to think through as they learn what it means to be good at math."

- Melinda Griffin, PhD
TFT Partnership Manager, REL Midwest

About the documentary

This 30-minute public television program, produced by the REL Midwest [Teaching Fractions Toolkit \(TFT\) partnership](#) in collaboration with Chicago public broadcasting station WTTW, presents strategies to increase learning, engagement, and performance in middle school math. In the program, research experts and educators discuss the importance of engaging middle school students in math learning to build fundamental mathematics skills. The program also features the stories of students benefitting from engaging math instruction, educators implementing evidence-based instructional practices, and school leaders supporting the implementation of these practices. The program features comments from REL Midwest experts, Yinmei Wan, PhD; Melinda Griffin, PhD; Katie Rich, PhD; and Pam Buffington, PhD.

About the Teaching Fractions Toolkit (TFT)

REL Midwest is developing a toolkit to support effective grade 6 fractions instruction based on the evidence-based recommendations in the [What Works Clearinghouse \(WWC\)](#) [Developing Effective Fractions Instruction for Kindergarten through 8th Grade Practice Guide](#).

The toolkit will include resources for grade 6 math teachers to support their understanding and implementation of best practices in fraction instruction. It will help administrators and math



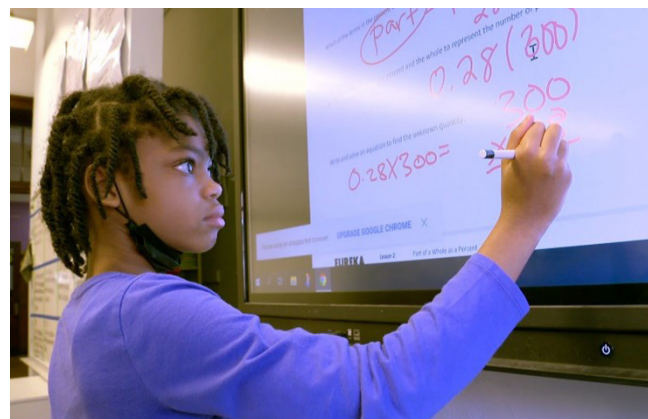
Scan the QR code
to watch the
documentary

Using Computational Thinking in Practice

One strategy for increasing mathematics engagement in middle school is to introduce computational thinking into math instruction.^{3,4} Computational thinking skills are problem-solving strategies that help students get started on challenging problems and develop ways to represent and express their thinking. Examples of computational thinking skills include:⁵

- **Pattern recognition:** Looking for ways that problems or situations are similar or different.
- **Abstraction:** Identifying and representing the important information in a problem or situation.
- **Decomposition:** Breaking a complex problem into smaller parts that are easier to address.
- **Debugging:** Finding and fixing mistakes to improve one's work.
- **Algorithms:** Developing and using systematic, step-by-step approaches to problems.⁶

leaders to understand the recommendations from the practice guide and explain how to support teachers to implement those recommendations. The toolkit resources are informed by research on the importance of engaging middle school students in math learning, the impact of middle school mathematics, and evidence-based instructional strategies identified in the practice guide. For more information, visit the [Teaching Fractions Toolkit \(TFT\) partnership](#).



Intended audience

REL Midwest created this documentary as a tool for teachers, school leaders, and district leaders to explore strategies for engaging students in the middle school math classroom. Although the documentary focuses on examples from Illinois, the best practices and strategies are relevant for policymakers and educators across the country.

Discussion questions

- ▶ What is your first reaction to this video? What parts resonate with you?
- ▶ How would you apply these experiences to math engagement in your school, district, or state?
- ▶ How do the strategies shown in the documentary align with the goals of your school and/or district? How can school and district leaders incorporate these approaches into their strategic planning?
- ▶ If you were part of an effort to explore ways to integrate evidence-based math strategies and/or computational thinking/fraction learning in your school or district, whom would you involve in those conversations? What steps would you and others need to take to move from discussion into action?
- ▶ What challenges do you see in using these strategies? What are possible ways to overcome these challenges?

About REL Midwest

REL Midwest is part of a network of 10 regional educational laboratories funded by the U.S. Department of Education's Institute of Education Sciences. REL Midwest works in partnership with practitioners in seven Midwest states to conduct applied research and provide training, coaching, and technical support to create a more evidence-based education system.

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- ⁵ Perez, A. (2018). A framework for computational thinking dispositions in mathematics education. *Journal for Research in Mathematics Education*, 49(4), 424–461. <https://eric.ed.gov/?id=EJ1183634>
- ⁶ REL Midwest. (2023). *Middle school math is an important bridge to lifelong STEM learning and success*. Institute of Education Sciences. <https://ies.ed.gov/ncee/rel/regions/midwest/pdf/RELMW-ENACT-Infographic-508.pdf>

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This material was prepared under Contract 91990022C0011 by Regional Educational Laboratory Midwest, administered by American Institutes for Research. The content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.