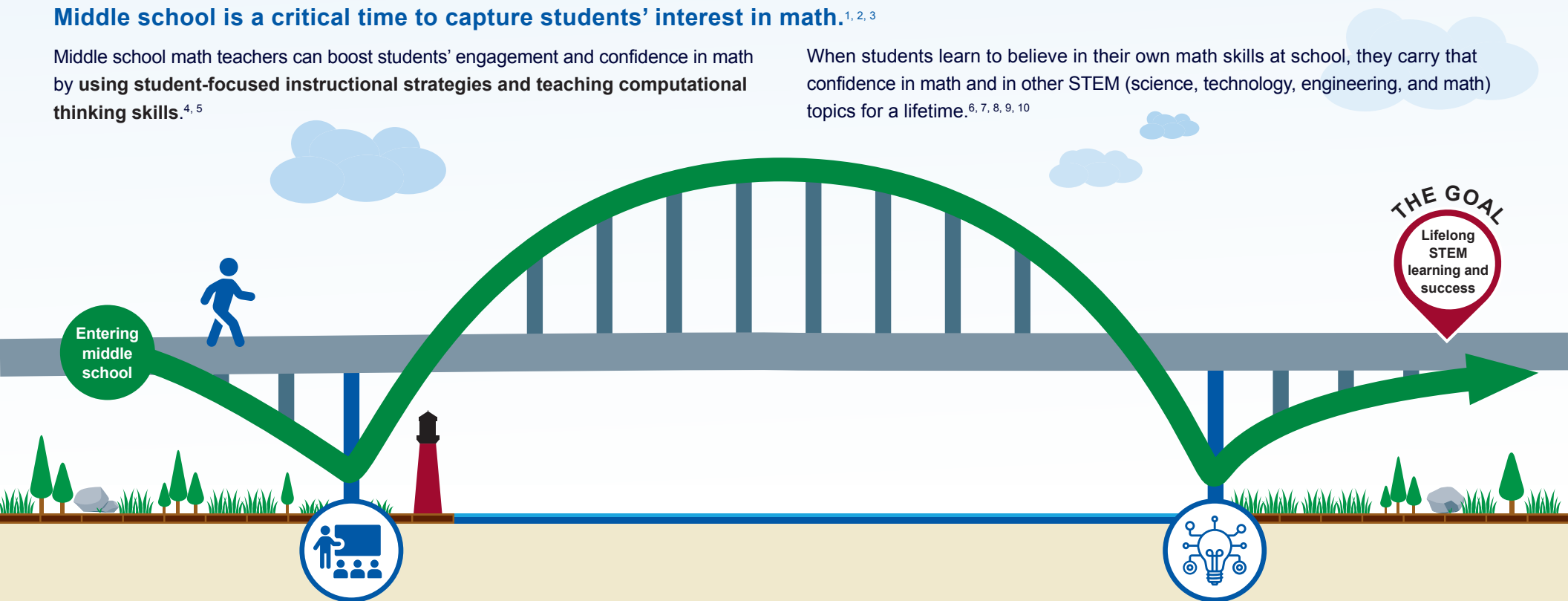


Middle school math is an important bridge to lifelong STEM learning and success.

Middle school is a critical time to capture students' interest in math.^{1, 2, 3}

Middle school math teachers can boost students' engagement and confidence in math by using **student-focused instructional strategies** and **teaching computational thinking skills**.^{4, 5}

When students learn to believe in their own math skills at school, they carry that confidence in math and in other STEM (science, technology, engineering, and math) topics for a lifetime.^{6, 7, 8, 9, 10}



Entering middle school

Teachers use **student-focused instructional strategies**

Student-focused instructional strategies help all students see themselves as important contributors to the classroom community, which in turn supports students' self-confidence with math and builds student engagement in math.¹¹

Teachers provide opportunities to use **computational thinking skills**

Computational thinking skills are problem-solving strategies that students learn to help them approach unfamiliar problems. These strategies encourage student inquiry and focus on deepening mathematical understanding of concepts instead of memorizing rules. These strategies also help students develop skills and mindsets that unlock pathways into high-wage, in-demand fields.¹²

THE GOAL
Lifelong STEM learning and success

What skills and strategies are incorporated?

Computational Thinking Skills

- **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

Student-Focused Instructional Strategies¹³

- Connecting math problems to real situations in students' lives
- Encouraging students to try different strategies for problem solving
- Discussing more than one way to solve a problem
- Communicating that students are bringing valuable ideas and work to the classroom
- Providing opportunities for raising student voice in every lesson

Teaching Computational Thinking Skills¹⁴

- Modeling using computational thinking skills for students
- Creating opportunities for students to use computational thinking
- Building students' confidence in using computational thinking
- Helping students make their thinking visible

ENACTing change in STEM teaching and learning through REL Midwest's ENACT partnership

REL Midwest is partnering with school districts in Wisconsin to increase grade 6 students' confidence, engagement, and achievement in math. The ENgagement and Achievement through Computational Thinking (ENACT) partnership supports grade 6 teachers in integrating computational thinking and student-focused strategies into their curriculum.



Teacher Experience and Outcomes

- **Increase teacher knowledge** of and capacity to model using computational thinking skills
- **Integrate computational thinking** with students' interests and experiences
- **Enrich existing curriculum** and instructional efforts
- **Reduce opportunity gaps** in math and computer science



Student Experiences and Outcomes

- **Develop confidence** in computational thinking skills and their abilities to use the skills independently
- **See connections** between math and their own interests and experiences
- **Gain exposure** to computational thinking skills
- **Build** real-world problem-solving skills

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