

## Math Success with DMTI

# TEACHER KNOWLEDGE: THE MOST POWERFUL DRIVER OF MATH SUCCESS

### In today's edition, we explore:

- **The Classroom Impact:** How teacher knowledge changes student learning.
- **The Three Essential Pillars** of effective math teaching.
- **Practical Strategies** you can use tomorrow to strengthen instruction.

### Educators!

This week, we are focusing on one of the most important—and often overlooked—drivers of student learning: What's the difference between a classroom where students follow steps and one where they truly *understand* math? The key factor is **teacher knowledge**.

Research consistently shows that a teacher's deep understanding of math content, how children learn, and how to teach it is the strongest school-based predictor of student achievement (Hill, Rowan, & Ball, 2005). When this knowledge is lacking, instruction often defaults to rules and shortcuts, leaving students with fragile skills. But when it is strong, teachers create classrooms rooted in sense-making.

### The Three Pillars of Effective Math Teaching

To move from procedural compliance to conceptual understanding, teachers need a strong foundation in three interconnected areas:

1. **Deep Mathematical Knowledge:** This goes beyond algorithms to understanding the *why*—the concepts of **unit, equivalence, and operation**. Teachers with this knowledge use models purposefully and help students see the coherent structure of math across grade levels.
2. **Knowledge of How Children Learn:** Understanding learning trajectories and common misconceptions (Clements & Sarama, 2014) allows teachers to interpret student thinking accurately, diagnose errors, and design instruction that builds on what students already know.
3. **Pedagogical Content Knowledge:** This is the specialized skill of *how to teach math effectively*. It includes facilitating productive discussions, using high-leverage instructional routines, and selecting tasks and representations that make concepts accessible.

## Key Strategies to Strengthen Your Practice Tomorrow

Here are actionable ways to apply this knowledge in your classroom:

- **Anticipate & Address Misconceptions:** Before a lesson, ask: "Where might my students struggle?" Planning how to address common errors ensures you can respond effectively in the moment.
- **Use Models with Purpose:** Choose a number line, array, or bar model specifically to highlight a key idea (e.g., fractions as numbers, multiplication as area). Ask yourself: "**What mathematical structure does this model reveal?**"
- **Weave in "Structural Language":** Consistently use words like **compose, decompose, iterate, partition, and equal** to help students articulate the underlying relationships in the math they are doing.
- **Ask "Why?" and "How do you know?":** Make student reasoning the central focus of classroom discourse. This provides you with real-time data on their understanding and builds a culture of sense-making.

By strengthening teachers' understanding of mathematics, how children learn, and the instructional practices that support reasoning, we empower students with the tools they need for success in mathematics and beyond.

## Your Turn to Share:

We want to hear from you! **What is one strategy YOU use to build mathematical understanding in your classroom?**

→ Email us at [contact@dmtinstitute.com](mailto:contact@dmtinstitute.com) with your tip. We will feature our favorite responses in an upcoming newsletter!

**Keep inspiring mathematical minds!**

## MORE INFORMATION

This newsletter is just a preview—there is more to explore! For the complete research overview and additional videos, visit the "DMT Insights" page at [dmtinstitute.com/research](https://dmtinstitute.com/research). You will find deeper insights, classroom strategies, downloadable resources, and more ways to expand your math teaching.

Have a classroom story, tip, or question to share? We love featuring educator voices and ideas. Email us at [mathsuccess@dmtinstitute.com](mailto:mathsuccess@dmtinstitute.com) to contribute a teaching tip or share your experience—your story could be in our next newsletter!

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