

NEWSLETTER

Issue 4 · 2024 · Math Success with DMTI



STRUCTURE IS WHAT STAYS THE SAME

Help students connect mathematics across topics and grades.

In today's edition, we explore:

- **The Structure Beneath Topics:** the small set of ideas that makes mathematics one subject.
- **Three Classroom Moves:** building structural language in the lessons you already teach.
- **What the Research Says:** why attending to structure helps students meet unfamiliar problems.

Educators!

This week we look at the small set of words that persists through every topic at every grade: unit, compose, decompose, iterate, partition, and equal. These six words are what make mathematics one subject rather than a list of unrelated procedures. Students who look for structure meet a new topic with a method rather than with a gap where a rule should be.

This is not a vocabulary list. Students should hear and use these words while they compose, decompose, iterate, and partition actual quantities.

The shift is from simply naming a quantity to seeing how it is structured and what you can do with it. Twenty-eight can be composed from two units of ten and eight units of one, and it can be partitioned into four sevens. Both readings are usable, and students who have neither are left memorizing.

Classroom Tips

Use the six words in the lessons you already teach. Say unit, compose, decompose, iterate, partition, and equal in the mathematics already on your plan. When you introduce fractions, show that one unit can be partitioned into equal smaller units and then iterated.

Make the structure visible before you name it. Use a bar model or an array to show the same structure in two topics, so students see that eight sevens decomposes into five sevens and three sevens the same way an expression will later. Use the model to make the relationship visible, then connect that relationship to the equation.

Ask students to describe what they did using the structural language. Have them explain how they composed or decomposed a number, or how they partitioned a shape. Naming the action helps make the relationship explicit and gives students language they can use when they meet it again.

Two Students, One Number

Teacher: Tell me about 28.

Student A: It is a 2 and an 8.

Student B: It is two tens and eight ones. It is also four sevens.

Both students can name the number. Student B can act on its structure.

What Does the Research Say?

Awareness of pattern and structure is closely tied to early mathematical development, and students who notice pattern and structure engage more successfully with complex tasks (Mulligan & Mitchelmore, 2009). Brendefur, Strother, Thiede, and Appleton (2021) describe how the DMT framework puts that structural language into daily instruction across the grades. Wittmann's work similarly emphasizes the mathematical structures that recur across problems and topics, and recognizing those structures can give students a familiar starting point in an unfamiliar task (Wittmann, 2020).

Structure is what stays the same when the topic changes.

Keep developing mathematical thinkers.

More Information

For the full research overview and the accompanying video, visit the DMT Insights page at mathsuccess.io/dmtinsights. You will find the Insight, the Companion, classroom resources, and related materials there. Have a classroom story, tip, or question to share? We feature educator voices and ideas. Email us at contact@dmtinstitute.com to contribute a teaching tip or share your experience. For ongoing support and practical updates, join the DMTI community on social media or visit mathsuccess.io and dmtinstitute.com.

