

DMT COMPANION

Insight 6 · 2024 · for teachers, coaches, principals, and families



EARLY PREDICTORS OF MATH SUCCESS

How to Use This

This Companion is for anyone working with DMT Insight 6. Start with the three questions that follow. Answer them before you read the Insight or watch the video, then come back and answer them again. The difference between the two shows you what you learned. Coaches can open a team meeting with the same three questions, and use the worked examples to keep the conversation close to the classroom.

Key Idea • Answer the three questions first, then read. The gap between your two answers is the point of the Companion.

Three Guiding Questions

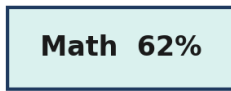
Answer these before you read the Insight or watch the video, then again afterward.

1. When you look at a student's mathematics data, do you see a total score or a profile of mathematical strengths and needs? Which gives you better information for instruction?
2. Two students both score in the middle. What would you need to know to be sure they need the same instruction?
3. What does each of the six areas reveal about how a student is reasoning, and what would you do differently if one area were substantially stronger or weaker than another?

Before and After: The Shift This Insight Asks For

The shift is from a level to a profile. In the before, a student has one mathematics score, which summarizes overall performance and hides what to teach. In the after, the same student has six areas examined separately, and each one shows something different about how the student is reasoning.

BEFORE • one score



*Summarizes overall performance.
Does not show what to teach next.*

AFTER • six areas, examined separately



A total can hide an uneven profile.

Before: one score, which summarizes. After: six areas, examined separately. A total can hide an uneven profile.

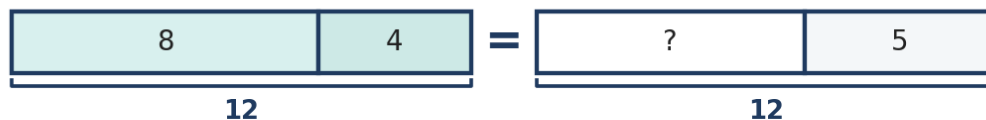
Two students can reach the same total by very different routes. One retrieves facts quickly but cannot yet represent a comparison situation. The other represents the structure well but still counts to find $8 + 6$. A total score hides that difference. Reading the six areas separately shows it.

Key Idea • A total score tells you how a student performed overall. A profile helps you decide what to teach.

Worked Examples: The Model and the Words to Use

Example 1 • relational thinking, $8 + 4 = ? + 5$

$8 + 4 = ? + 5$: the same total, said two ways



Two bar models of the same total. The equals sign states a relationship between quantities rather than instructing a student to compute.

The language to use:

"Both bar models are the same length. What does that tell you about the two sides?"

"You do not have to add anything yet. If this side has 5 instead of 4, what has to happen to the other part?"

"The equals sign tells us the two expressions name the same quantity. It is not telling you to work it out."

Example 2 • measurement, iterating one unit

Measurement : iterate one unit along the length



One unit iterated along a length. The relationship among the unit, the number of iterations, and the total length carries into number lines, fractions, and decimals.

The language to use:

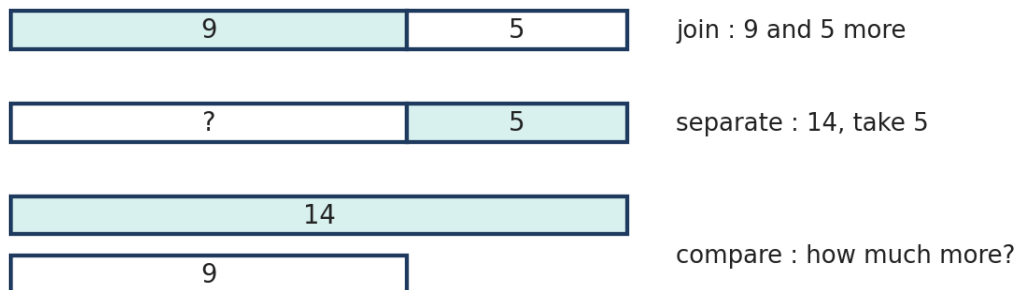
"This is our unit. How many times do we lay it down to cover the whole length?"

"What happens to the count if I use a smaller unit? Does the length change?"

"Six iterations of the unit compose the length. What would happen if we partitioned each unit into smaller equal units?"

Example 3 • contextual problems, three structures

Three situation structures, one model



The numbers may be the same while the relationship among the quantities changes. The model helps students see the structure of the situation rather than rely on keywords.

The language to use:

"Do not tell me the answer yet. Draw the bar model first."

"What quantities are related? What do we know? What is unknown?"

"Where is the unknown in your bar model? How does the bar model show that relationship?"

Key Idea • One model per example, and the words to say alongside it. The model makes the relationship visible; precise language helps students describe and reason about it.

The Language Shift

Keep this by the board. The left column names a level. The right column names what a student can and cannot yet do.

Instead of	Say
She is low in math.	Her contextual reasoning is strong; fact fluency is still developing.
He needs more practice.	What mathematical idea needs more work?
They are on grade level.	Where is the student strong, and what are we still building?
Find the answer.	Draw the situation first, then find the answer.
Just count them.	Can you see how many without counting?

What to look for in a classroom:

- Instruction aimed at a named mathematical idea, rather than at a general level.
- Students drawing a situation before computing it.
- Measurement and spatial tasks appearing regularly, not only in a geometry unit.

Key Idea • Each area tells us something different about how a student is reasoning. Assessment matters when it changes what we teach next.

Where to Go Next

Read DMT Insight 6, Early Predictors of Math Success, and watch the short video. Find both at mathsuccess.io/dmtinsights, along with the rest of the DMT Insights series.

Try this with one student this week. Pick a child you find hard to place, and work through the six areas one at a time. The uneven ones will tell you where to start.