

DMT COMPANION

Insight 7 · 2024 · for teachers, coaches, principals, and families



THE LEARNING TRIFECTA

How to Use This

This Companion is for anyone working with DMT Insight 7. 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. 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 a student is stuck, how long do you let the silence run before you step in, and what are you deciding in that moment?
2. Look at this week's practice set. Is it one problem type repeated, or a mix that asks students which method applies?
3. Can your students still do in November what they could do in September, and how would you find out?

Before and After: The Shift This Insight Asks For

The shift is from what works during the lesson to what remains after it. Blocked practice, one problem type at a time, produces fluent-looking work in the moment because every problem uses the method just shown. Mixed practice often looks less fluent during the lesson because students must decide which method applies. That decision is part of what we want students to learn.

BEFORE · blocked practice



One type at a time. The page tells the student which method to use.

The method is given.

AFTER · mixed practice



Types mixed. The student decides which method fits each problem.

Choosing the method is part of the work.

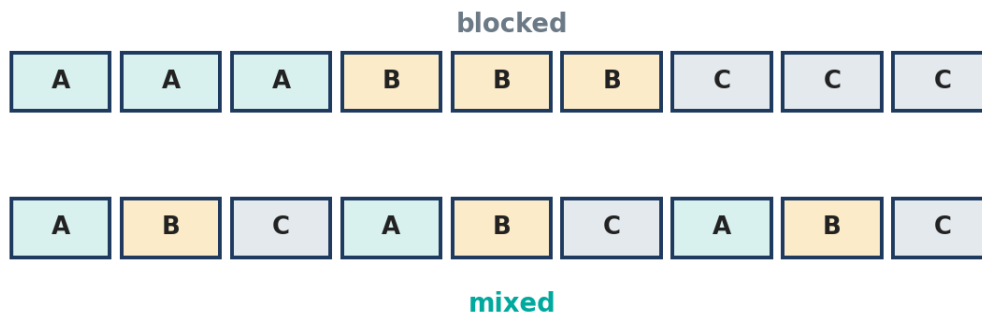
Before: one type at a time, so the method is given. After: types mixed, so choosing the method becomes part of the work.

The same idea runs through all three practices in this Insight. Productive struggle, restraint with hints, and mixed practice each leave more of the mathematical decisions with the student.

Key Idea • The goal is not to create difficulty. It is to preserve the mathematical thinking students need to do for themselves.

Worked Examples: The Model and the Words to Use

Example 1 · the same nine problems, two orders



Blocked on top, mixed underneath. The problems are identical; only the order changes.

The language to use:

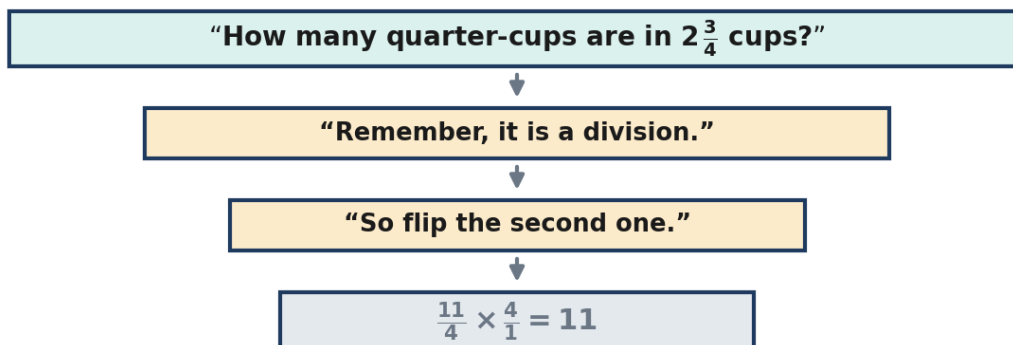
“Today’s set has three kinds mixed. Your first job on each one is to work out which kind it is.”

“This may feel harder because I am not telling you which method to use. Deciding what kind of problem you are looking at is part of the mathematics.”

“Before you start, tell me what makes this one different from the one above it.”

Example 2 • what a hint costs

Each hint removes a decision. The concept problem becomes a procedure.



Each hint removes a decision. By the final line, the student may be carrying out steps correctly without having decided why division applies or what the quantities represent.

The language to use:

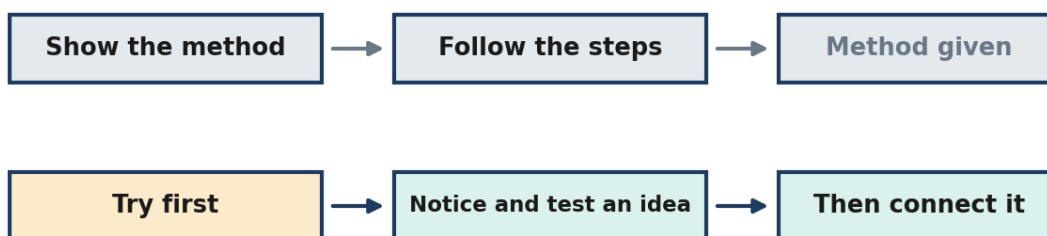
“What have you tried so far? Show me where it stopped working.”

“I am not going to tell you which operation. What is the question actually asking you to find?”

“Take two more minutes with it. If you are still stuck then, I will ask you a question, not give you the step.”

Example 3 • try first, then connect

The same lesson, two orders



The attempt gives the explanation something to connect to.

The same lesson in two orders. The attempt gives the later explanation something to connect to.

The language to use:

“Have a go before I explain anything. I want to see what you notice and what you try.”

“Three of you tried this in different ways. Let us look at what each method was keeping track of.”

“Now let us connect what you tried to the mathematical relationship.”

Key Idea • The teacher’s question should press the student’s reasoning without doing the mathematical thinking for them.

The Language Shift

Keep this by the board. The left column often removes a mathematical decision. The right column keeps that decision with the student.

Instead of	Say
Here is the first step.	What have you tried so far?
Remember, it is a division.	What is the question asking you to find?
Let me make it easier.	Take two more minutes with it.
Today we are doing subtraction.	Some of these are subtraction. Work out which.
You should have this by now.	Take another minute. Tell me what you know and what you are trying to figure out.
Good, you got it quickly.	Good. Now try one that does not use the same method.

What to look for in a classroom:

- A pause after a student says they are stuck, before the teacher supplies a step.
- Teacher questions that press students to explain or represent the relationship.
- Practice sets that require students to distinguish among problem structures.
- Students choosing a representation or method rather than being told which one to use.
- Students explaining why a method fits the quantities and relationships.

Key Idea • A hint can remove the decision. A guiding question keeps the mathematical decision with the student.

Across the Grades

None of the three is tied to a topic or a grade. What changes is the mathematics they are applied to.

The practice	Example	Model	The shift it asks for
Productive struggle	Give a comparable problem before the method is taught, in Grades K-2	Bar model, number line	From waiting to be shown to representing the quantities and trying a relationship
Restraint with hints	Answer a Grades 3-5 fraction question with a question, not a step	Number line, area model	From running a method to choosing a method and explaining what it is keeping track of
Mixed practice	Mix ratio, rate, and percentage problems in one Grades 6-8 assignment	Double number line, ratio table	From recognizing the chapter to reading the quantities, relationships, and structure of the problem

Key Idea • Blocked practice can make the method obvious. Mixed practice requires the student to determine which mathematical relationship and method fit the problem.

Where to Go Next

Read DMT Insight 7, The Learning Trifecta, and watch the short video. Find both at mathsuccess.io/dmtinsights, along with the rest of the DMT Insights series.

Try this with one assignment this week. Take a practice set that repeats one problem type and reorder it so the types alternate. Tell your students why, and tell their parents too: deciding which method fits is part of the mathematics.