

DMT COMPANION

Insight 27 · 2026 · for instructional coaches, teachers, and school leaders



PRETEACHING: PREPARING STUDENTS FOR MATHEMATICAL THINKING

A guide for coaches to examine instructional planning and student readiness

What Should Preteaching Accomplish?

Preteaching begins with the mathematics students will encounter in an upcoming lesson. Instructional coaches can help teachers identify the prior knowledge students need, examine student work, and determine which relationships to address before the lesson.

Preteaching lets students examine key mathematical relationships before the main lesson. This preparation may reduce the need for reteaching by addressing gaps in prior knowledge before students encounter new mathematics. The goal is to prepare students to reason during grade-level instruction, not simply demonstrate the procedures they will use.

Key Idea • Preteaching prepares students to reason during the lesson. It should not do the lesson's reasoning for them.

Three Guiding Questions for Coaches

Use these questions when planning with a teacher or a grade-level team.

1. What mathematical relationships will students need to understand to participate in the upcoming lesson?
2. What does student work reveal about the units, quantities, and relationships students already understand?
3. What should be introduced or revisited before the lesson, and what should students investigate during the lesson?

A Coaching Planning Process

Coaches and teachers can work through five decisions together—the last one returns to student work after the lesson.

Coaching decision	Questions to examine
1. Identify the mathematics	What is the central relationship in the upcoming lesson?
2. Examine prior knowledge	What do students already understand about the relevant quantities and units?
3. Select preteaching content	Which earlier relationship or representation will help students access the lesson?
4. Plan the instruction	What short task or discussion will reveal and develop that understanding?
5. Examine the results	What does student work from the main lesson reveal about the effectiveness of the preteaching, and what should we change for future lessons?

Worked Examples

Example 1 · preparing for fraction addition: $\frac{1}{3} + \frac{1}{4}$

Rather than teaching the common-denominator procedure before the lesson, the coach helps the teacher plan a short task on the unit of 1, partitioning, and the size of fractional units. Students partition the same unit of 1 into three equal quantities and into four equal quantities, compare one-third and one-fourth, and explain why the fractional units differ in size.

The same unit of 1, partitioned two ways



one-third: 1 of 3 equal parts



one-fourth: 1 of 4 equal parts

Which fractional unit is larger? Why?

Students partition the same unit of 1 into thirds and fourths and compare the fractional units before developing equivalence and addition.

Coaching question:

“What do students understand about partitioning the unit of 1, and how will that help them reason about adding fractions?”

Questions for students:

“What is the unit of 1?”

“How did you partition the unit of 1 to show one-third? One-fourth?”

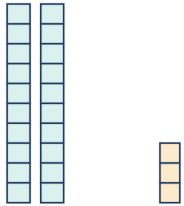
“Which fractional unit is larger? How do you know?”

Preteaching should not remove the reasoning students need to do during that lesson.

Example 2 • preparing for multiplication with place value: 23×4

Preteaching revisits composing and decomposing two-digit numbers into tens and ones. Students represent 23 as 2 tens and 3 ones and explain the value of each digit. During the main lesson, students multiply each quantity by 4 and combine the partial products. Keeping these stages separate leaves the reasoning about multiplication for the lesson.

Before the lesson: preteaching



23 is 2 tens and 3 ones.

2 tens 3 ones

What is the value of each digit?

During the main lesson

$$2 \text{ tens} \times 4 = 8 \text{ tens} = 80$$
$$3 \text{ ones} \times 4 = 12 \text{ ones} = 12$$
$$\mathbf{80 + 12 = 92}$$

Students multiply each part by 4 and combine the partial products.

Preteaching revisits 23 as 2 tens and 3 ones. The main lesson develops the partial products.

Coaching question:

“Do students understand that the 2 in 23 represents 2 tens? What representation would help make that relationship visible?”

Questions for students:

“How many tens are in 23? How many ones?”

“How could you show 23 using tens and ones?”

Key Idea • In both examples, preteaching revisits the unit: fractional units in the first, tens and ones in the second. The lesson develops the new relationship.

Preteaching and Reteaching

Preteaching and reteaching serve different purposes. Preteaching can be more effective because students examine key mathematical relationships before encountering the main lesson. Reteaching responds to evidence of student thinking after instruction. Both are important, but preparing students before difficulties arise may reduce the need for reteaching. DMT Insight 28 examines reteaching.

	Preteaching	Reteaching
When	Before the main lesson	After instruction or assessment reveals a difficulty
Starting evidence	What the upcoming lesson requires and what students already understand	What student work reveals about students' current reasoning
Focus	Relationships, representations, and language students will need	The relationship students are not yet using as intended
Coach's question	"What mathematical relationships can we develop before the lesson so students are better prepared to reason during instruction?"	"What does this work tell us about how students are reasoning?"

After the Lesson: Examining the Results

The coaching cycle continues after the lesson. Coaches and teachers review student work from the main lesson to decide whether the preteaching helped students participate and what to change next time.

Questions for a coaching conversation:

- Did students use the relationship from the preteaching during the lesson? Where?
- Did the preteaching prepare students to reason during the lesson, or did it introduce procedures students were intended to develop themselves?
- Did students who received preteaching require less additional instruction after the lesson?
- Which students need additional preparation for the next lesson, and which need reteaching?
- What will we change in the next preteaching session?

For School Leaders

Preteaching should add to grade-level instruction, not replace it. Leaders can schedule preteaching so students do not miss core mathematics, and protect time for teachers and coaches to plan together and examine student work.

Across the Grades

The same planning process applies across grade levels—the mathematics changes.

Grade band	Upcoming lesson	Possible preteaching	Relationship to revisit
Grades K–2	$8 + 5$ by making ten	Ten-frames showing 8 and 2	Composing ten
Grades 3–5	$\frac{1}{3} + \frac{1}{4}$	Partitioning the same unit of 1	The size of fractional units
Grades 6–8	Finding a unit rate	Ratio tables with a familiar context	What one unit represents

Continue With DMT Insight 27

Read DMT Insight 27 for the research behind this Companion. Find it at mathsuccess.io/dmtinsights.

As you plan with teachers, identify the mathematical relationships students will need in an upcoming lesson. Examine student work, decide what to address through preteaching, and return to student responses after the lesson to evaluate its effectiveness.