

NEWSLETTER

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PRETEACHING: PREPARING STUDENTS FOR MATHEMATICAL THINKING

What teachers can do before the lesson begins.

In today's edition, we explore:

- **Preteaching:** preparing students for the mathematics of an upcoming lesson
- **Classroom tips:** four planning considerations and a fraction example
- **The research:** what studies of prior knowledge and preteaching suggest

Educators!

When planning a mathematics lesson, teachers consider what students need to understand and what they already know. Sometimes students need an opportunity to revisit a mathematical relationship or become familiar with the language and representations they will encounter before the lesson begins.

Preteaching lets teachers address important mathematical relationships before students encounter new content. Instead of waiting until students struggle and then reteaching, teachers can use preteaching to build relevant prior knowledge and prepare students to participate in the main lesson.

Classroom Tips

1. **Identify the mathematical relationship.** Determine what quantities, units, or relationships students will need for the upcoming lesson.
2. **Examine prior knowledge.** Use a short task or student explanation to determine what students already understand.
3. **Select a useful representation.** Choose a model, diagram, or equation that makes an important relationship visible.
4. **Connect the preparation to the lesson.** Help students recognize how the earlier mathematics relates to the ideas they will develop during instruction.

For example, before a lesson on adding fractions with unlike denominators, students might compare one-third and one-fourth of the same unit of 1. Students can partition the unit of 1 into thirds and fourths, compare the sizes of those fractional units, and explain what they notice. The main lesson then develops equivalence and addition.

What Does the Research Say?

Research on prior knowledge and cognitive load helps explain why students may benefit from preparation before learning new mathematics (Sweller, 1988). When students understand relevant quantities, relationships, and mathematical language, they can better attend to the ideas introduced during the lesson.

Lalley and Miller (2006) examined preteaching and reteaching with third-grade students who had low achievement in mathematics. Both approaches improved achievement, but only the preteaching group showed a significant improvement in academic self-concept. Although one study does not establish that preteaching is always more effective, it suggests that preparing students before instruction may offer advantages beyond reteaching after students experience difficulty.

When teachers identify and develop important mathematical relationships before a lesson, students may be better prepared to participate and reason during instruction. Preteaching can reduce the need for reteaching while helping students develop mathematical understanding and increasingly efficient strategies.

Keep developing mathematical thinkers.

More Information

Read DMT Insight 27, watch the accompanying video, and download the Companion at mathsuccess.io/dmtinsights.

How do you decide what to preteach? Share it with us at contact@dmtinstitute.com.

For more information on professional development and curricular resources, visit mathsuccess.io.



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