

NEWSLETTER

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UNDERSTANDING STATE MATHEMATICS ASSESSMENTS: WHAT THEY MEASURE AND HOW TEACHERS CAN USE THEM

What state results show, and what classroom evidence adds.

In today's edition, we explore:

- **Three questions:** what to ask about any assessment task
- **DMTI categories and DOK:** two frameworks that provide different information
- **The research:** what classroom assessment adds to state results

Educators!

State mathematics assessments provide information about student achievement relative to grade-level standards. Classroom assessments give teachers additional opportunities to examine students' strategies, representations, explanations, and mathematical understanding.

When examining an assessment task, ask three questions.

Classroom Tips

1. **Name the mathematical knowledge.** Ask, "What concepts, procedures, and relationships does this task assess?"
2. **Identify the thinking required.** Ask, "What decisions and reasoning does the task require?" A model or explanation alone does not raise the demand.
3. **Examine the response.** Ask students to explain their strategy or show another representation before deciding what instruction is needed.

Using Assessment Blueprints

Assessment blueprints describe how state tests sample mathematical content and, in some cases, the types of tasks students will encounter. Teachers can use this information alongside grade-level standards and classroom evidence. Grade-level standards and mathematical learning progressions should guide instruction. Assessment blueprints provide additional information about how the content is assessed.

DMTI's Assessment Categories

Each category is illustrated here with third-grade place value. The complete tasks are in the Companion.

Level 1 (Skill/Recall): Identify the value of the 4 in 347.

Level 2 Problem Solving (L2P): Solve a contextual problem involving hundreds, tens, and ones.

Level 2 Conceptual (L2C): Represent 347 in two ways by composing or decomposing place-value units.

Level 3 (Reasoning/Justification): Evaluate a claim about regrouping place-value units and justify whether the quantity changes.

These categories examine different aspects of mathematical knowledge. Webb's DOK framework assesses a task's cognitive demand. The two frameworks provide different information and should not be treated as equivalent.

Connecting Mathematical Content

Mathematical ideas are connected across content areas. Finding the area of a rectangle involves multiplication and measurement of square units. Interpreting a line plot of fractional measurements involves understanding the unit of 1, partitioning, and representing quantities on a number line.

Instruction should help students recognize these relationships while developing conceptual understanding and procedural fluency.

What Does the Research Say?

Research shows that formative assessment, the process of gathering and using evidence during instruction, can improve student learning (Black & Wiliam, 1998). Shepard (2019) argues that classroom assessment supports learning when it is connected to curriculum and instruction.

State assessment results can identify patterns in student achievement. Classroom tasks and student explanations help teachers investigate which mathematical relationships students understand and which need further development.

Keep developing mathematical thinkers.

More Information

Read DMT Insight 22 and download the Companion at mathsuccess.io/dmtinsights.

To share a classroom example or a question, contact us at contact@dmtinstitute.com.

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

