

NEWSLETTER

Issue 42 · 2026 · Math Success with DMTI



UNDERSTANDING DIMENSIONS: THE FOUNDATION OF MEASUREMENT

How linear, square, and cubic units help students reason about measurement.

Educators!

When students measure length, width, or height, they use linear units such as inches, centimeters, or meters. These are one-dimensional measurements.

Area measures the amount of surface covered and uses square units. Volume measures the space a solid occupies and uses cubic units.

Understanding these dimensions helps students identify what they are measuring and select appropriate units. This is especially important with area and perimeter because both describe the same figure, but they measure different quantities.

What Students' Responses Show

A student finds the area of a rectangle by adding its four side lengths—another multiplies length by width to determine perimeter. A third assumes that a figure with a greater perimeter must also have a greater area.

These responses raise an important instructional question: Do students understand what they are measuring? Their responses are evidence to investigate, not a diagnosis.

Understanding Units and Dimensions

Length and width are measured in linear units, but area is measured in square units. For a rectangle 6 cm long and 4 cm wide, the perimeter is $6 + 4 + 6 + 4 = 20$ cm. The area is 4 rows of 6 square centimeters, or 24 cm^2 . The units differ because perimeter measures the boundary length, while area counts the square units covering the surface.

Classroom Tips

Questions to ask students:

- What attribute are we measuring?
- What unit are we using?
- How are the units iterated or structured?

- How does the model or equation represent the measurement?

Reviewing Lessons and Materials

Review whether lessons:

- Explicitly distinguish linear units from square units.
- Connect measurement tools and representations to the attribute being measured.
- Include comparisons of equal areas with different perimeters and equal perimeters with different areas.
- Connect formulas to unit structure and provide opportunities for explanation and practice.

What Does the Research Say?

Research on measurement describes how students develop an understanding of units: iterating equal units, covering a surface without gaps or overlaps, and arranging square units in rows and columns (Battista, 2004; Lehrer, 2003). Learning trajectories describe how this understanding develops for length and area (Clements & Sarama, 2014).

The next time students confuse area and perimeter, ask them what they are measuring, what unit they are using, and how their model represents that quantity.

Keep developing mathematical thinkers.

More Information

Read DMT Insight 42 at mathsuccess.io/dmtinsights.

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

