

NEWSLETTER

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NUMBER LINES OR 100S CHARTS? IT DEPENDS ON THE MATHEMATICS

What does each representation make visible?

In today's edition, we explore:

- What a 100s chart and a number line each make visible
- Three distinctions that matter in the classroom
- Questions to ask about any representation
- A task to try tomorrow

Educators!

A 100s chart and a number line may contain many of the same numbers, but they organize those numbers differently. That matters. Each representation makes different mathematical relationships visible.

What Does Each Representation Make Visible?

- 1. Patterns vs. magnitude.** A 100s chart makes counting and base-ten patterns visible. A number line makes magnitude, order, and distance visible.
- 2. Position vs. unit.** On a number line, equal intervals represent equal units. Ask students to identify the unit before locating a number.
- 3. Whole numbers to fractions.** Partition the interval from 0 to 1 into equal parts, then iterate that fractional unit to locate fractions.

Questions to Ask

- What is the unit?
- Where is zero?
- What does the distance between these numbers represent?
- What changes when we partition the unit?
- What relationship does this representation make easier to see?
- Could another representation make a different relationship visible?

Classroom Tip

Build a large number line, but do not label every position. Give students 0 and one benchmark, then ask them to determine where another quantity belongs and justify its position. Change the unit and ask what must change.

Try This Tomorrow

Draw a number line and mark only 0 and 20. Ask: Where is 5 located? Where is 15? How do you know? Tell students the second mark is now 100, not 20. Ask: What must change? What stays the same? On a 100s chart, ask: Why does moving down one row change the number by ten?

Each question asks students to reason about the unit and the relationship, not to follow a movement.

What Does the Research Say?

How accurately students place numbers on a number line is associated with their broader mathematical competence (Schneider et al., 2018). In one experiment, the orientation of a hundreds chart changed how often young children counted by tens but not their place-value understanding (Osana et al., 2023). Neither study compares the two representations directly, so neither shows that one is better than the other.

The question is not, “Which model is best?” Ask instead, “What mathematical relationship do I want students to see?” A model earns its place when it makes that relationship visible.

Keep developing mathematical thinkers.

More Information

This is a quick overview. To download the full research overview on number lines and 100s charts and watch the short video, go to DMT Insights at mathsuccess.io/dmtinsights.

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