

NEWSLETTER

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FROM SCREENS TO SENSEMAKING: WHAT ARE WE MISSING?

How digital tools support and limit mathematical understanding.

In today's edition, we explore:

- **The research:** what studies show about digital and hands-on representations
- **Classroom tips:** choosing technology for a mathematical purpose
- **A fraction example:** what students attend to on and off the screen

Educators!

Digital tools are part of mathematics instruction in many classrooms. Adaptive software, online games, and video lessons can provide representations, feedback, and practice opportunities. The important question is what mathematics students are learning through these activities.

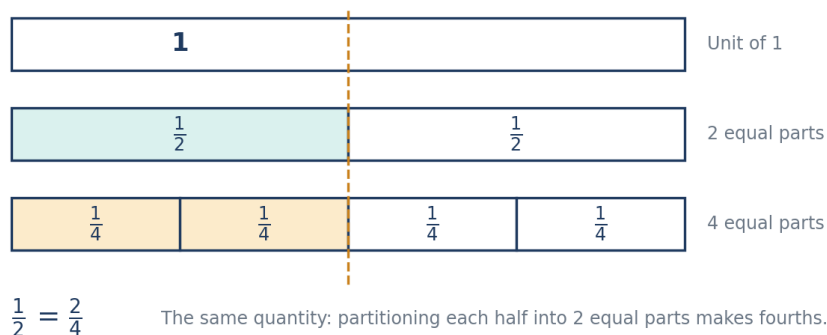
Students need opportunities to identify units and quantities, represent mathematical relationships, explain their reasoning, and develop procedural fluency. Physical materials, discussion, and digital tools can each support this work when used for a clear instructional purpose.

Classroom Tips

1. **Choose tools for a mathematical purpose.** Ask, "What relationship does this tool help students see? What is the unit?"
2. **Pair digital work with discussion.** Ask students to explain what each number represents and why their strategy works, on or off the screen.
3. **Connect practice to mathematical relationships.** Use digital practice to develop accuracy and efficiency. Examine student responses and provide opportunities to explain the relationships underlying their calculations.

A Fraction Example

Consider $\frac{1}{2}$ and $\frac{2}{4}$. Students can partition the same unit of 1 into two equal parts and then partition each half into two equal parts. The representation shows that one-half and two-fourths are equivalent.



Physical and digital fraction strips can both represent this relationship. Ask students to identify the unit of 1, explain how it was partitioned, and describe why the two fractions are equal.

What Does the Research Say?

Meta-analyses have found positive average effects for virtual manipulatives (Moyer-Packenham & Westenskow, 2013) and concrete manipulatives (Carbonneau et al., 2013), with effects depending on how instruction connects the materials to the mathematics. A review of 74 studies found a small positive effect of educational technology on mathematics achievement (Cheung & Slavin, 2013). These findings suggest that instructional design and how teachers use representations are important considerations when selecting digital and physical materials.

Keep developing mathematical thinkers.

More Information

Read DMT Insight 36 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.



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