

NEWSLETTER

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GIVE THE PROCEDURE SOMEWHERE TO LIVE

Build the idea first, and the procedure has somewhere to live.

In today's edition, we explore:

- **The Order That Matters:** why students meet the idea before the steps that record it.
- **Pressing Conceptually:** how asking for the relationship, not just the answer, changes a lesson.
- **What the Research Says:** why conceptual understanding and procedural fluency develop together.

Educators!

This week we look at the order in which students meet an idea and the steps that record it. When students understand why a procedure works, they can rebuild a forgotten step, judge whether an answer is reasonable, and carry the idea into a problem they have not seen. With only the steps, a forgotten step is gone.

The shift is to press students conceptually. Instead of moving straight to the algorithm, ask students to connect one model to another, put an informal method into more formal terms, and explain why a step is allowed. Fluency still matters. It arrives more reliably when understanding comes first.

Classroom Tips

Lead with the mathematical relationship. Have students meet the idea on a bar model, a number line, or an area model before the steps. To subtract 17 from 42, show 4 tens and 2 ones, then decompose one unit of ten so that 42 is renamed as 3 tens and 12 ones. The written regrouping step records that decomposition.

Ask what the written step keeps track of. Require students to explain why a procedure works, not only that it gives the right answer. Point at a written step and ask where that relationship appears in the model they just drew.

Formalize after students have something to formalize. Delay the standard algorithm until students can reason without it, and ask whether an answer is reasonable before checking whether it is exact.

Two Students, One Answer

Both students found 25. One remembered the regrouping steps. The other could explain that one unit of ten had been decomposed into ten units of one. The answer was the same; the evidence of understanding was not.

What Does the Research Say?

Conceptual and procedural knowledge develop together rather than in a single direction, and gains in understanding lead to gains in procedural skill more reliably than the reverse (Rittle-Johnson, Siegler, & Alibali, 2001). The National Research Council (2001) describes mathematical proficiency as five interwoven strands, with conceptual understanding and procedural fluency supporting each other rather than one preceding the other. When students organize a procedure around mathematical relationships, they rely less on remembering a collection of disconnected steps (Gilmore, Attridge, & Cragg, 2017).

A procedure with a mathematical idea underneath it can be rebuilt. A procedure without one can only be lost.

Keep developing mathematical thinkers.

More Information

For the full research overview and the accompanying video, visit the DMT Insights page at mathsuccess.io/dmtinsights. You will find the Insight, the Companion, classroom resources, and related materials there.

Have a classroom story, tip, or question to share? We feature educator voices and ideas. Email us at contact@dmtinstitute.com to contribute a teaching tip or share your experience. For ongoing support and practical updates, join the DMTI community on social media or visit mathsuccess.io and dmtinstitute.com.

