

Investigations Math Practices Paper



Research
into Practice:
MATHEMATICS

Investigations 3: Making Sense of and Persevering with the Mathematical Practices

BY DEBORAH SCHIFTER AND SUSAN JO RUSSELL



Students' experiences in the elementary grades are critical to how they come to view mathematics. In these grades, does mathematics invite them in or shut them out? Do students come to think of mathematics as intriguing and engaging or as boring and unapproachable? Do they learn that they can have mathematical ideas? Do they learn to willingly tackle unfamiliar problems?

Developing a productive orientation to mathematics is fundamentally about the practices of the discipline. Over the years, several policy documents have identified essential aspects of what it means to do mathematics productively. The National Council of Teachers of Mathematics' *Principles and Standards for School Mathematics* (2000) defined five "process standards": problem solving, reasoning and proof, communication, connections, and representation. The National Research Council's report, *Adding It Up* (2001), defined five strands of mathematical proficiency: adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.