DOINGWHATWORKS

National Mathematics Advisory Panel: K-8 Benchmarks

National Mathematics Advisory Panel, U.S. Department of Education

Topic: Response to Intervention in Elementary-Middle Math

Practice: Foundations of Arithmetic

The National Mathematics Advisory Panel conducted a rigorous, systematic review of the best available scientific evidence for teaching and learning math and provided concrete recommendations to improve math education, with a specific focus on preparation for learning algebra. The Panel's final report[1] contains 45 findings and recommendations on topics including instructional practices, materials, professional development, and assessments. This one-page summary of the K-8 mathematics benchmarks recommended by the Panel serves as guideposts for state frameworks and school districts.

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1 Learn more about the Panel's findings and download the full report, *Foundations for success: The final report of the National Mathematics Advisory Panel* at http://www2.ed.gov/Math-Panel.

National Mathematics Advisory Panel
Benchmarks for the Critical Foundations of Algebra
Grades K-8

The national panel conducted a systematic review of the best available scientific evidence and recommended ways to advance the teaching and learning of mathematics, with a specific focus on preparation for learning algebra. The benchmarks listed below were recommended to serve as guideposts for state frameworks and school districts.

Fluency With Whole Numbers
1. By the end of Grade 3, students should be proficient with the addition and subtraction of whole numbers.
2. By the end of Grade 5, students should be proficient with multiplication and division of whole numbers.

Fluency With Fractions
1. By the end of Grade 4, students should be able to identify and represent fractions and decimals, and compare them on a number line or with other common representations of fractions and decimals.
2. By the end of Grade 5, students should be proficient with comparing fractions and decimals and common percent, and with the addition and subtraction of fractions and decimals.
3. By the end of Grade 6, students should be proficient with multiplication and division of fractions and decimals.
4. By the end of Grade 6, students should be proficient with all operations involving positive and negative integers
5. By the end of Grade 7, students should be proficient with all operations involving positive and negative fractions.
6. By the end of Grade 7, students should be able to solve problems involving percent, ratio, and rate and extend this work to proportionality.

Geometry and Measurement
1. By the end of Grade 5, students should be able to solve problems involving perimeter and area of triangles and all quadrilaterals having at least one pair of parallel sides (i.e., trapezoids).
2. By the end of Grade 6, students should be able to analyze the properties of two-dimensional shapes and solve problems involving perimeter and area, and analyze the properties of three-dimensional shapes and solve problems involving surface area and volume.
3. By the end of Grade 7, students should be familiar with the relationship between similar triangles and the concept of the slope of a line.