

FIFTH GRADE

In the Fifth Grade competencies and objectives, rational and whole number computations are now at a skill level. Students apply the properties of real numbers and computations in algebraic contexts. Generalizations and patterns are more formal. Transformational geometry is used as a tool for students to continue their geometric explorations. Students develop formulas for perimeter and area of polygons as part of these explorations. Data analysis now includes interpretations of line graphs, stem-and-leaf plots, histograms, and box-and-whisker plots. Continued emphases should be placed on communicating mathematically through writing, speaking, reading, and critical listening. Mathematics instruction at this level should include manipulatives, cooperative and collaborative learning experiences, and justifications, proofs or arguments to support reasoning. The framework is comprised of five content strands: **number and operations, algebra, geometry, measurement, and data analysis & probability**. The five process strands are **problem solving, reasoning & proof, communication, connections, and representation**. The five interrelated content strands along with the five process strands combine to provide continuity to the teaching of K – 12 Mathematics. Even though the process strands are not listed throughout the framework, these strands should be incorporated when presenting the content of the curriculum. The competencies, printed in bold face type, are the required learning standards for all students. The Mississippi Curriculum Test, Second Edition (MCT2) and Mississippi Subject Area Tests are aligned to the competencies. Competencies do not have to be taught in the order presented in the framework. The competencies are presented in outline form for consistency and for easy reference throughout the framework. Competencies are intentionally broad in order to allow school districts and teachers the flexibility to create a curriculum that meets the needs of their students. They may relate to one, many, or all of the mathematics framework strands and may be combined and taught with other competencies throughout the school year. Competencies provide a general guideline of on-going instruction, not isolated units, activities, or skills. The competencies are not intended to be a list of content skills that are taught and recorded as “mastered.” The objectives indicate how competencies can be fulfilled through a progression of content and concepts at each grade level and course. Many of the objectives are interrelated rather than sequential, which means that objectives are not intended to be taught in the specific order in which they are presented. Multiple objectives can and should be taught at the same time.

The Mississippi Curriculum Test, Second Edition (MCT2) will be developed based on the objectives found in the framework. At least fifty percent (50%) of the test items on the MCT2 must match the Depth of Knowledge level assigned to the objectives for each competency. The Depth of Knowledge (DOK) level is indicated at the end of each objective.

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CONTENT STRANDS:

Number and Operations Algebra

Geometry Measurement

Data Analysis & Probability

Competencies and Objectives:

NUMBER AND OPERATIONS

1. Analyze relationships among numbers and the four basic operations, compute fluently, and make reasonable estimates.

- a. Compare and order integers, decimals to the nearest thousandths, like and unlike fractions, and mixed numbers using $>$, $<$, and $=$. (DOK 1)
- b. Compose and decompose seven-digit numbers and decimals through thousandths in word, standard, and expanded forms. (DOK 1)
- c. Identify factors and multiples of whole numbers. (DOK 1)
- d. Model and distinguish between prime and composite numbers. (DOK 1)
- e. Model and identify equivalent fractions including conversion of improper fractions to mixed numbers and vice versa. (DOK 1)
- f. Add, subtract, multiply, and divide (with and without remainders) using nonnegative rational numbers. (DOK 1)
- g. Estimate sums, differences, products, and quotients of non-negative rational numbers to include strategies such as front-end rounding, benchmark numbers, compatible numbers, and rounding. (DOK 2)

ALGEBRA

2. Explain and analyze number relationships and functions using algebraic symbols, and demonstrate an understanding of the properties of the basic operations.

- a. Determine the value of variables in equations and inequalities, justifying the process. (DOK 2)
- b. Devise a rule for an input/output function table, describing it in words and symbols. (DOK 2)
- c. Apply the properties of basic operations to solve problems: (DOK 2)
 - Zero property of multiplication
 - Commutative properties of addition and multiplication
 - Associative properties of addition and multiplication
 - Distributive properties of multiplication over addition and subtraction
 - Identity properties of addition and multiplication
- d. Apply inverse operations of addition/subtraction and multiplication/division to problem-solving situations. (DOK 2)

GEOMETRY

3. Develop mathematical arguments about geometric relationships and describe spatial relationships using coordinate geometry.

- a. Analyze and describe the characteristics of symmetry relative to classes of polygons (parallelograms, triangles, etc.). (DOK 2)
- b. Explain the relationships between coordinates in each quadrant of the coordinate plane. (DOK 2)
- c. Describe the characteristics, including the relationship of the pre-image and the image, of each type of transformation (rotations [turns], reflections [flips], and translations [slides]) of two-dimensional figures. (DOK 2)
- d. Construct and analyze two- and three-dimensional shapes to solve problems involving congruence and symmetry. (DOK 3)
- e. Label ordered pairs in the coordinate plane. (DOK 1)

MEASUREMENT

4. Develop concepts and apply appropriate tools and techniques to determine units of measure.

- a. Estimate and measure length to nearest millimeter in the metric system and onesixteenth inch in the English system. (DOK 2)
- b. Convert units within a given measurement system to include length, weight/mass, and volume. (DOK 1)
- c. Develop, compare, and use formulas to estimate and calculate the perimeter and area of rectangles, triangles, and parallelograms. (DOK 2)
- d. Select and apply appropriate units for measuring length, mass, volume, and temperature in the standard (English and metric) systems. (DOK 1)

DATA ANALYSIS & PROBABILITY

5. Interpret and analyze data and make predictions.

- a. Use the mean, median, mode, and range to analyze a data set. (DOK 2)
- b. Compare data and interpret quantities represented on tables and graphs, including line graphs, stem-and-leaf plots, histograms, and box-and-whisker plots to make predictions, and solve problems based on the information. (DOK 2)