

## FOURTH GRADE

While recall of multiplication and division facts is included in the Fourth Grade framework, students continue a conceptual development of rational and whole numbers. Benchmark numbers are emphasized with regard to decimals and fractions. Whole number computation begins a more concentrated focus on developing algorithms for multi-digit numbers. Because fourth-grade students can use more complex communication skills, they begin to justify solution processes for solving for unknowns in word problems and equations with variables. Transformational geometry is introduced at this grade level. Data analysis includes stem-and-leaf plot graphs and coordinate geometry explorations begin. The instructional emphases are on mathematical language development with writing and talking mathematics, multiple representations, and routine and non-routine problem solving. 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.**

# FOURTH GRADE

## CONTENT STRANDS:

Number and Operations Algebra

Geometry Measurement

Data Analysis & Probability

## Competencies and Objectives:

### NUMBER AND OPERATIONS

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

- a. Add and subtract up to five-digit whole numbers with and without regrouping. (DOK 1)
- b. Add and subtract decimals through hundredths. (DOK 1)
- c. Explain two or more methods of multiplying whole numbers (one- and two-digits) with justification. (DOK 2)
- d. Explain two or more methods of dividing four-digit dividends by one- and two-digit divisors, with and without remainders, and justify the processes. (DOK 2)
- e. Add and subtract fractions with like denominators. (DOK 1)
- f. Model and identify equivalent fractions. (DOK 2)
- g. Represent equivalence relationships between fractions and decimals using concrete materials, diagrams, or other models. (DOK 1)
- h. Estimate products and quotients of whole numbers to include strategies such as rounding. (DOK 2)
- i. Recall multiplication and division facts. (DOK 1)
- j. Compose and decompose five-digit numbers and decimal numbers through hundredths, with representations in words, physical models, and expanded and standard forms. (DOK 1)
- k. Determine and use benchmark numbers such as 0, 0.5 ( $\frac{1}{2}$ ), and 1 to judge the magnitude of whole numbers, decimals, and fractions. (DOK 2)
- l. Model factors and multiples of whole numbers. (DOK 1)

### ALGEBRA

#### 2. Analyze and represent patterns, number relationships, and functions using algebraic symbols. Demonstrate an understanding of the properties of the basic operations.

- a. Analyze a given numeric pattern and generate a similar pattern. (DOK 2)
- b. Determine the value of variables in equations; justify the process used to make the determination. (DOK 2)
- c. Construct input/output function tables and generalize the rule using words, models, and symbols. (DOK 3)
- d. Explain the properties of the basic operations using models, numbers, and variables: (DOK 2)
  - Zero property of multiplication
  - Associative properties of addition and multiplication
  - Commutative properties of addition and multiplication
  - Identity properties of addition and multiplication
  - Distributive properties of multiplication over addition and subtraction
- e. Demonstrate and explain the inverse operations of addition/subtraction and multiplication/division. (DOK 2)

## **GEOMETRY**

### **3. Analyze characteristics, properties, and relationships of two- and threedimensional geometric shapes. Use coordinate geometry.**

- a. Analyze and describe the similarities and differences between and among two and three-dimensional geometric shapes, figures, and models using mathematical language. (DOK 2)
- b. Identify and analyze the relationships between and among points, lines, line segments, angles, and rays. (DOK 2)
- c. Identify transformations (rotations [turns], reflections [flips], and translations [slides]) of two-dimensional figures. (DOK 1)
- d. Locate ordered pairs in the first quadrant of the coordinate plane. (DOK 1)

## **MEASUREMENT**

### **4. Evaluate and justify measurable attributes of objects, units, systems, and processes.**

#### **Perform measurements.**

- a. Estimate and measure a given object to the nearest eighth of an inch. (DOK 2)
- b. Convert capacity, weight/mass, and length within the English and metric systems of measurement. (DOK 1)
- c. Describe relationships of rectangular area to numerical multiplication. (DOK 2)
- d. Use appropriate tools to determine, estimate, and compare units for measurement of weight/mass, area, size of angle, temperature, length, distance, and volume in English and metric systems and time in real-life situations. (DOK 1)

## **DATA ANALYSIS & PROBABILITY**

### **5. Formulate and analyze data. Evaluate inferences and predictions.**

- a. Draw, label, and interpret bar graphs, line graphs, and stem-and-leaf plots. (DOK 2)
- b. Find and interpret the mean, mode, median, and range of a set of data. (DOK 1)
- c. Compare data and interpret quantities represented on tables and graphs including line graphs, bar graphs, frequency tables, and stem-and-leaf plots to make predictions and solve problems based on the information. (DOK 3)