

**Grade Six**  
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**Correlations with Oklahoma**  
**Instructional Mathematical Goals and Objectives**

The following concepts and skills are required by all students completing sixth grade. The **Major Concepts** should be taught in depth using a variety of methods and applications so that all students have accessibility to and an understanding of these concepts. **Maintenance Concepts** have been taught previously and are a necessary foundation for success in mathematics at this level.

**MAJOR CONCEPTS**

**Patterns, Functions, and Algebra**

**Properties, Factors, Multiples,  
Primes, GCF, LCM,  
Order of Operations**

**Number Sense-**

**Common Percents,  
Fraction-Decimal Comparisons**

**Operations-**

**Add, Subtract, Multiply and Divide  
Fractions**

**Geometry-**

**Symmetry, Congruency,  
Similarity, Angles, Circles,  
Transformations**

**Measurement-Applications, Customary**

**Data Analysis and Statistics-**

**Collect, Analyze, Mean, Median  
Mode, Range**

**MAINTENANCE CONCEPTS**

**Patterns-**

**Algebraic Expressions**

**Number Sense-**

**Common Percents,  
Fraction-Decimal Comparisons**

**Operations-**

**Multiplication and Division  
Algorithms, Decimals-Add,  
Subtract, Multiply, Divide  
Fractions-Compare and Order,  
Estimation**

**Geometry-**

**Classify Shapes, Simple  
Formulas**

**Measurement-Explore Volume**

**Data Analysis-**

**Statistics and Probability  
Appropriate Tables and Graphs,  
Mean and Probability**

**THINK STAR** ★

Use the image of a star with **Content** at its center and **Problem Solving, Communications, Connections, Reasoning, and Representation** at its five points to design illuminating lessons (see page 77).

## I. **Patterns, Functions, and Algebra**

- A. Describe, extend, and create patterns using tables, graphs, models, and rules and represent with symbols (e.g., recursive patterns like Fibonacci numbers). **Appetizers 2 B, E, and F; 5 B; 12 B; Main Dish Objective 2 (Mathematical Relations) Lessons 2, 5, and 6; Objective 5 (Probability/Statistics) Lesson 2; Objective 12 (Mathematical Representation) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- B. Create a generalization or rule from several examples (e.g., if you join card tables end to end how can you find the perimeter when you know the number of tables? Let  $P$  = perimeter and  $S$  = sides then  $P = 2S + 2$ ). **Appetizers 2 A and F; 3 A and D; 4 D and E; 5 A and C; 11 B and D; Main Dish Objective 2 (Mathematical Relations) Lessons 1 and 6; Objective 3 (Geometry) Lessons 1 and 4; Objective 4 (Measurement) Lessons 4 and 5; Objective 5 (Probability/Statistics) Lessons 1 and 3; Objective 11 (Solution Strategies) Lessons 2 and 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- C. Locate and enter information in a spreadsheet-like chart arranged in rows and columns (e.g., what is the entry in cell B3?).
- D. Use number patterns to discover and describe proportions of number sets (e.g., prime, composite, odd and even numbers, integers, and number sequences). **Appetizers 1 A; Main Dish Objective 1 (Number Concepts) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- E. Apply the **order of operations** and note the applications to calculators.
- F. Demonstrate the concepts of Greatest Common Factor (GCF) and Least Common Multiple (LCM) using factor trees and prime factorization. **Appetizers 1 D; Main Dish Objective 1 (Number Concepts) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**

## II. **Number Sense**

- A. Develop **estimation** and computation skills with fractions (e.g., manipulatives, sets of objects, paper folding, fraction strips,  $10 \times 10$  grids, number lines, area models, paper and pencil). **Appetizers 1 C and D; 2 F; 6 C; 7 B; Main Dish Objective 1 (Number Concepts) Lessons 3 and 4; Objective 2 (Mathematical Relations) Lesson 6; Objective 6 (Addition) Lesson 3; Objective 7 (Subtraction) Lesson 2 Applications; Final Tests; Reasonableness Problems; Journal Topics**
- B. Compare and simplify fractions and name equivalent fractions in a variety of ways. **Appetizers 1 C and D; 6 C; 7 B; Main Dish Objective 1 (Number Concepts) Lessons 3 and 4; Objective 6 (Addition) Lesson 3; Objective 7 (Subtraction) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**

- C. Choose appropriate representations from among whole numbers, fractions, decimals, and percents (e.g., 15% for discount,  $3/20$  for probability, \$0.15 for money). **Appetizers 1 E; 10; Main Dish Objective 1 (Number Concepts) Lesson 5; Objective 10 (Estimation); Applications; Final Tests; Reasonableness Problems; Journal Topics**
- D. Identify and apply equivalent fractions, decimals, and percent values for common fractions: halves, thirds, fourths, fifths, and tenths.
- E. Convert, compare, and order decimals (terminating and non terminating), fractions, and percents using a variety of methods. **Appetizers 1 A, C, D, and E; Main Dish Objective 1 (Number Concepts) Lessons 1, 3, 4, and 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- F. **Estimate** solutions to multi-step problems using decimals, fractions, and percent and determine whether solutions are reasonable (e.g., use appropriate **estimation** strategies such as front end, rounding; use **number sense** to determine reasonableness of results). **Appetizers 1 B; 10 A, B, C, D, E, F, and G; Main Dish Objective 1 (Number Concepts) Lesson 2; Objective 10 (Estimation) Lessons 1, 2, 3, 4, 5, 6, and 7; Applications; Final Tests; Reasonableness Problems; Journal Topics**

### III. Operations

- A. Add, subtract, multiply, and divide fractions. **Appetizers 6 C; 7 B; 9 G; Main Dish Objective 6 (Addition) Lesson 3; Objective 7 (Subtraction) Lesson 2; Objective 9 (Division) Lesson 7; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- B. Apply the basic arithmetic operations to fractions, decimals, and percents in problem solving situations. **Appetizers 6 C and D; 7 B, C, and D; 8 D; 9 E and F; Main Dish Objective 6 (Addition) Lessons 3 and 4; Objective 7 (Subtraction) Lessons 2, 3, and 4; Objective 8 (Multiplication) Lesson 4; Objective 9 (Division) Lessons 5 and 6; Applications; Final Tests; Reasonableness Problems; Journal Topics**

### IV. Geometry

- A. Identify, compare, and measure acute, obtuse, right, complementary, and supplementary angles. **Appetizers 3 D; Main Dish Objective 3 (Geometry) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- B. Identify lines of symmetry and classify figures in terms of congruency and similarity. **Appetizers 3 C; 11 C; Main Dish Objective 3 (Geometry) Lesson 3; Objective 11 (Solution Strategies) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**

- C. Develop and use formulas to find the circumference and area of circles (e.g., use string the length of the diameter of various circular lids to approximate the circumference and develop the concept of pi).  
**Appetizers 4 D; 11 B; Main Dish Objective 4 (Measurement) Lesson 4; Objective 11 (Solution Strategies) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- D. Describe the effect of performing basic transformations on objects and figures (e.g., explore translation [slide], reflection [flip], rotation [turn] with mirrors, folded paper, computer software, graph paper).  
**Appetizers 3 C; Main Dish Objective 3 (Geometry) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- V. **Measurement—Application and Customary**
- A. Compare and convert units within the same measurement system and express the conversions using appropriate unit labels (e.g., square inches to square feet, centimeters to meters, hours to minutes).  
**Appetizers 4 A, B, and C; Main Dish Objective 4 (Measurement) Lessons 1, 2, and 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- B. Compute measurements of combined units (e.g.,  $9'8'' + 3'6'' = \underline{\quad}' \underline{\quad}''$  and  $\underline{\quad}'' = \underline{\quad}' \underline{\quad}''$ , 150 minutes =  $\underline{\quad}$  hours and  $\underline{\quad}$  minutes). **Appetizers 4 A, B, and C; Main Dish Objective 4 (Measurement) Lessons 1, 2, and 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- C. Select and use appropriate units, scale, and tools for measurement in practical applications (e.g., ruler, weight scale). **Appetizers 4 A; Main Dish Objective 4 (Measurement) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- D. Justify reasonable **estimates** for measurements (e.g., use indirect measures, like grids, to **estimate** the area of irregular shapes).  
**Appetizers 4 A, B, and C; Main Dish Objective 4 (Measurement) Lessons 1, 2, and 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- IV. **Data Analysis**
- A. Collect, organize, and interpret data to solve problems (e.g., data from student experiments, tallies, Venn diagrams, tables, circle and bar graphs, spreadsheets). **Appetizers 5 B; 12 B; Main Dish Objective 5 (Probability/Statistics) Lesson 2; Objective 12 (Mathematical Representation) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**

- B. Construct and interpret graphs of statistical data (e.g., explain how different representations lead to different interpretations and may distort information). **Appetizers 5 B; 12 B; Main Dish Objective 5 (Probability/Statistics) Lesson 2; Objective 12 (Mathematical Representation) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**
- C. Interpret a set of data using **mean, median, mode**, and range in a variety of contexts. **Appetizers 5 B; 12 B; Main Dish Objective 5 (Probability/Statistics) Lesson 2; Objective 12 (Mathematical Representation) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**