MATH CURRICULUM

FOURTH GRADE

Goal

      The fourth grade mathematics program emphasizes addition, subtraction, multiplication, and division of large whole numbers. Students in the fourth grade can be expected to solve problems involving the addition and subtraction of fractions and decimals. Students will understand the properties of and relationships between plane and solid geometric figures. They will use patterns and basic algebraic thinking to solve problems. In addition, fourth graders will collect, organize, and analyze data and interpret probability experiments.

      While learning mathematics, students should be actively engaged and using concrete materials. Students should also be encouraged to correctly use the concepts, skills, symbols, and vocabulary associated with mathematics.

Number Sense and Operations

1. **The student will understand the concept of whole numbers and their relationship to decimals and fractions.**
   a. Read, write, and compare numbers through the millions using standard and expanded notation.
   b. Identify, compare, and order fractions, and mixed numbers.
   c. Compare the numerical value of fractions having like and unlike denominators.
   d. Recognize equivalent fractions.
   e. Recognize that fractions and decimals are parts of a whole.
   f. Order and compare decimals to the hundredths.
   g. Round to the nearest whole number (tenth and hundredth).

2. **The student will demonstrate an understanding of negative numbers.**
   a. Recognize concepts with negative numbers (e.g. on a number line, in counting, in temperatures).
   b. Identify, on a number line, the relative position of positive and negative whole numbers.

3. **The student will demonstrate an understanding of the four operations.**
   a. Apply multiplication and division facts through the 12s.
   b. Find the products of multi-digit factors (when one factor has two digits or less and the other factor has three digits or less).
   c. Find the quotient of two whole numbers involving division of multi-digit numbers by single-digit numbers (with and without remainders).

d. Add and subtract with fractions and decimals.
e. Apply estimation skills in problems associated with whole numbers, fractions, and decimals.
f. Identify the appropriate order of operations in multi-step problems.

Patterns, Relations, and Algebra

1. The student will use number patterns and relationships to solve problems and evaluate expressions.
   a. Recognize, create, and extend numeric and geometric patterns, using a variety of models (e.g. lists, number lines, symbols, and tables).
   b. Use nonnumeric symbols to represent quantities in expressions or equations. Determine solutions.
   c. Use parentheses to indicate which operation to complete first when writing expressions containing more than two terms and different operations.
   d. Determine that an equality relationship between two quantities remains the same as long as the same change is made to both quantities.

Geometry

1. The student will demonstrate an understanding of the properties and relationships in geometry.
   a. Identify points, lines, and angles (acute, right, and obtuse).
   b. Identify intersecting, parallel, and perpendicular lines, and line segments and their midpoints.
   c. Identify congruent and non-congruent shapes.
   d. Recognize congruence of plane figures after geometric transformations such as rotations (turns), reflections (flips), and translations (slides).
   e. Identify different triangles and quadrilaterals by their attributes.
   f. Identify, locate, and plot ordered pairs of whole numbers on a graph, or on the first quadrant of a coordinate system.
   g. Identify radius, diameter and chord of a circle.

Measurement

1. The student will select and use appropriate units and instruments for measurement.
   a. Identify approximate equivalent measurement between the U.S. Customary system and the metric system (e.g. ounces and pounds, feet and yards).
   b. Identify equivalent measurement within the metric system (e.g. grams and kilograms, centimeters and meters).
   c. Compare/contrast U.S. Customary units and metric units (e.g. 1 kilogram is a little more than 2 pounds, 1 kilometer is slightly farther than ½ a mile).

d.   Solve problems with elapsed time.
2. **The student will explore the use of formulas that assist in measurement situations.**
   a.   Measure the perimeter of rectangles and triangles.
   b.   Measure the area of rectangles using the appropriate units (e.g. square cm).

Data Analysis, Statistics, and Probability

1. **The student will demonstrate an understanding of data collection, display, and interpretation.**
   a.   Formulate survey questions, systematically collect and represent appropriate data.
   b.   Display data in a variety of ways, including circle graphs.
   c.   Use scale increments to represent data in various forms.
   d.   Use mode, median, and mean to describe results and make predictions.

2. **The student will make predictions for simple probability situations.**
   a.   Investigate probability by experimenting with devices that generate random outcomes (e.g. coins, number cubes, spinners).
   b.   Predict outcomes of experimental probability situations verbally and numerically (e.g., 1 out of 2, ½)