MATH CURRICULUM

SIXTH GRADE

Goal

Students in the sixth grade mathematics program will master the four arithmetic operations with positive and negative numbers, whole numbers, fractions, and decimals. Students will use ratios to compare data sets. They will begin using integers and percents and will be introduced to algebraic terms and solving algebraic equations in one variable. Students in the sixth grade will classify and measure three-dimensional figures and will make conversions within a given measurement system. In addition, they will collect, analyze, display, and interpret data by using a variety of graphical and statistical methods. They will calculate range, mean, median, and mode of data sets and will find the probability of an event.

While learning mathematics, students should be actively engaged and using appropriate technologies, such as calculators, computers, spreadsheets, laser discs, and videos to enhance their understanding of qualitative concepts and for proficiency in basic computations. Students should correctly use the concepts, skills, symbols, and vocabulary associated with mathematics.

Number Sense and Operations

1. **The student will solve problems involving fractions, decimals, ratios, proportions, and percentages.**
   a. Compare and order decimals, fractions, mixed numbers, and positive and negative integers on a number line.
   b. Identify and represent equivalent decimals, fractions, and percents.
   c. Find common multiples and factors, including least common multiple and greatest common factor.
   d. Identify and describe prime and composite numbers through 100.
   e. Describe and compare two sets of data, using ratios and the appropriate notations (e.g. a/b a to b, a:b).
   f. Determine that a proportion is an equal ratio. Use proportions to solve problems.

2. **The student will solve problems involving addition, subtraction, multiplication, and division.**
   a. Add, subtract, multiply, and divide fractions, mixed numbers, and decimals.
   b. Calculate given percentages of quantities. Solve problems involving discounts at sales, interest earned, sales tax, etc.
   c. Add and subtract positive and negative integers.

d. Use the order of operations to simplify numerical expressions with parentheses and exponents.
e. Use estimation strategies to solve multi-step problems involving decimals, fractions, and percents.

Patterns, Relations, and Algebra

1. The student will write, evaluate, and solve simple equations.
   a. Write and solve one-step linear equations in one variable.
   b. Use variables to describe numerical expressions and relationships.
   c. Investigate and describe concepts of positive exponents, perfect squares and square roots. Use a calculator to develop exponential patterns.

2. The student will analyze and use tables, graphs, and rules to solve problems involving ratios and proportions.
   a. Use graphic forms to solve problems involving numerical relationships (including inequalities).
   b. Solve problems involving rates, average speed, distance and time.

Geometry

1. The student will identify and classify the properties of and relationships between geometric figures.
   a. Classify and draw solid figures (e.g. rectangular prisms, cones, cylinders, and pyramids).
   b. Describe and apply the property of symmetry in figures.
   c. Identify congruent figures.
   d. Compare and Contrast quadrilaterals (e.g. parallelograms, rectangles, squares, rhombi, trapezoid).
   e. Identify and compare polygons (e.g. pentagons, hexagons, heptagons, octagons, nonagons, decagons).
   f. Classify three-dimensional figures from various perspectives (e.g. top, side, front).
   g. Identify segments, congruent angles, bisectors of line segments and bisectors of angles.
   h. Identify and perform transformations (e.g. reflection, translation, rotation) of a given figure in a coordinate plane.

Measurement

1. The student will select appropriate units and tools for measurement tasks.
   a. Explain the need for precision.
   b. Compute the least and greatest possible error.

   c. Compare weights, capacities, geometric measures, times, and temperatures within, and between, measurement systems (e.g. miles per hour, feet per second).

2. The student will select and use appropriate units for measurement.
   a. Compare measurements of length, area, capacity, weight, and time expressed in a given unit to other units in the same measurement system.
   b. Compute measurements of combined units (e.g. 9'6" + 3'6" = ?).
   c. Compare/contrast Fahrenheit and Celsius temperatures.
   d. Use indirect measures, such as grids, to estimate the area of irregular shapes.
   e. Use the appropriate tool to measure length, temperature, and angle in customary and metric systems.

Data Analysis, Statistics, and Probability

1. The student will collect, analyze, display, and interpret data in a variety of methods.
   a. Read and analyze data displayed in a variety of forms (e.g. charts, pictographs, stem and leaf plots).
   b. Compute the range, mean, median, and mode of a set of data.
   c. Use measures of central tendency to compare two sets of data.
   d. Identify different ways to select samples. Determine when to use sample data or population data.

2. The student will explore probability and chance.
   a. Identify probabilities of events and predict outcomes.
   b. Represent all possible outcomes for compound events in an organized manner (e.g. spreadsheets, tables, tree diagrams).