Grade Five

The fifth-grade standards place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display, and analyze data in a variety of ways and solve probability problems, using a sample space or tree diagram. Students also will solve problems involving volume, area, and perimeter. Students will be introduced to variable expressions and open sentences.

While learning mathematics, students will be actively engaged, using concrete materials and appropriate technologies such as calculators and computers. However, facility in the use of technology shall not be regarded as a substitute for a student's understanding of quantitative concepts and relationships or for proficiency in basic computations.

Mathematics has its own language, and the acquisition of specialized vocabulary and language patterns is crucial to a student's understanding and appreciation of the subject. Students should be encouraged to use correctly the concepts, skills, symbols, and vocabulary identified in the following set of standards.

Problem solving has been integrated throughout the six content strands. The development of problem-solving skills should be a major goal of the mathematics program at every grade level. Instruction in the process of problem solving will need to be integrated early and continuously into each student's mathematics education. Students must be helped to develop a wide range of skills and strategies for solving a variety of problem types.

Number and Number Sense

5.1   The student will
   a) read, write, and identify the place values of decimals through thousandths;
   b) round decimal numbers to the nearest tenth or hundredth; and
   c) compare the values of two decimals through thousandths, using the symbols >, <, or =.

5.2   The student will
   a) recognize and name commonly used fractions (halves, fourths, fifths, eighths, and tenths) in their equivalent decimal form and vice versa; and
   b) order a given set of fractions and decimals from least to greatest. Fractions will include like and unlike denominators limited to 12 or less, and mixed numbers.

Computation and Estimation

5.3   The student will create and solve problems involving addition, subtraction, multiplication, and division of whole numbers, using paper and pencil, estimation, mental computation, and calculators.

5.4   The student will find the sum, difference, and product of two numbers expressed as decimals through thousandths, using an appropriate method of calculation, including paper and pencil, estimation, mental computation, and calculators.

5.5   The student, given a dividend of four digits or fewer and a divisor of two digits or fewer, will find the quotient and remainder.

5.6   The student, given a dividend expressed as a decimal through thousandths and a single-digit divisor, will find the quotient.

5.7   The student will add and subtract with fractions and mixed numbers, with and without regrouping, and express answers in simplest form. Problems will include like and unlike denominators limited to 12 or less.

Measurement

5.8   The student will describe and determine the perimeter of a polygon and the area of a square, rectangle, and right triangle, given the appropriate measures.

5.9   The student will identify and describe the diameter, radius, chord, and circumference of a circle.

5.10   The student will differentiate between perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.

5.11   The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of
           a) length — part of an inch (1/2, 1/4, and 1/8), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers;
           b) weight/mass — ounces, pounds, tons, grams, and kilograms;
           c) liquid volume — cups, pints, quarts, gallons, milliliters, and liters;
           d) area — square units; and
           e) temperature — Celsius and Fahrenheit units.
           Problems also will include estimating the conversion of Celsius and Fahrenheit units relative to familiar situations (water freezes at 0°C and 32°F, water boils at 100°C and 212°F, normal body temperature is about 37°C and 98.6°F).

5.12   The student will determine an amount of elapsed time in hours and minutes within a 24-hour period.

5.13   The student will measure and draw right, acute, and obtuse angles and triangles, using appropriate tools.

Geometry

5.14   The student will classify angles and triangles as right, acute, or obtuse.

5.15   The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will
   a) recognize, identify, describe, and analyze their properties in order to develop definitions of these figures;
   b) identify and explore congruent, noncongruent, and similar figures;
   c) investigate and describe the results of combining and subdividing shapes;
   d) identify and describe a line of symmetry; and
   e) recognize the images of figures resulting from geometric transformations such as translation (slide), reflection (flip), or rotation (turn).

5.16   The student will identify, compare, and analyze properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).

Probability and Statistics

5.17   The student will
   a) solve problems involving the probability of a single event by using tree diagrams or by constructing a sample space representing all possible results;
   b) predict the probability of outcomes of simple experiments, representing it with fractions or decimals from 0 to 1, and test the prediction; and
   c) create a problem statement involving probability and based on information from a given problem situation. Students will not be required to solve the created problem statement.

5.18   The student will, given a problem situation, collect, organize, and display a set of numerical data in a variety of forms, using bar graphs, stem-and-leaf plots, and line graphs, to draw conclusions and make predictions.

5.19   The student will find the mean, median, mode, and range of a set of data.

Patterns, Functions, and Algebra

5.20   The student will analyze the structure of numerical and geometric patterns (how they change or grow) and express the relationship, using words, tables, graphs, or a mathematical sentence. Concrete materials and calculators will be used.

5.21   The student will
    a) investigate and describe the concept of variable;
    b) use a variable expression to represent a given verbal quantitative expression involving one operation ; and
    c) write an open sentence to represent a given mathematical relationship, using a variable.

5.22   The student will create a problem situation based on a given open sentence using a single variable.