

Grade Five Mathematics

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 area and perimeter, classify triangles, and plot points in the coordinate plane. Variables, expressions, and open sentences will be introduced. 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. Students also will identify real-life applications of the mathematical principles they are learning that can be applied to science and other disciplines they are studying.

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 read, write, and identify the place values of decimals through ten-thousandths.
- 5.2 The student will compare the value of two decimals through ten-thousandths using the symbols $>$, $<$, or $=$.

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 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 less and a divisor of two digits or less, will find the quotient and remainder.
- 5.6 The student, given a dividend expressed as a decimal through ten-thousandths and a single-digit divisor, will find the quotient.
- 5.7 The student will add and subtract with fractions and mixed numerals, 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 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 area and perimeter and identify whether the application of the concept of perimeter or area 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
 - length—part of an inch ($1/2$, $1/4$, and $1/8$), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers;
 - weight/mass—ounces, pounds, tons, grams, and kilograms;
 - liquid volume—cups, pints, quarts, gallons, milliliters, and liters;
 - area—square units; and
 - 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.

Geometry

- 5.13 The student will classify angles and triangles as right, acute, or obtuse.
- 5.14 The student will measure and draw right, acute, and obtuse angles and triangles, using appropriate tools.
- 5.15 The student will identify the ordered pair for a point and locate the point for an ordered pair in the first quadrant of a coordinate plane.

Probability and Statistics

- 5.16 The student will
- solve problems involving the probability of a single event by using tree diagrams or by constructing a sample space representing all possible results; and
 - create a problem statement involving probability based on information from a given problem situation. Students will not be required to solve the problem created.
- 5.17 The student will collect, organize, and display a set of numerical data in a variety of forms, given a problem

situation, using bar graphs, stem-and-leaf plots, and line graphs.

- 5.18 The student will find the mean and mode of a set of data.

Patterns, Functions, and Algebra

- 5.19 The student will investigate, describe, and extend numerical and geometric patterns, including triangular numbers, perfect squares, patterns formed by powers of 10, and arithmetic sequences. Concrete materials and calculators will be used.
- 5.20 The student will
- investigate and describe the concept of variable;
 - use a variable to represent a given verbal quantitative expression, involving one operation; and
 - write an open sentence, using a variable to represent a given mathematical relationship.
- 5.21 The student will create a problem situation based on a given open sentence using a single variable.