

Grade Four

The fourth-grade standards place emphasis on multiplication and division with whole numbers and solving problems involving addition and subtraction of fractions and decimals by finding common multiples and factors. Students will be fluent in the basic multiplication facts through the twelve's table and the corresponding division facts as they become proficient in multiplying larger numbers. Students also will refine their estimation skills for computations and measurements. Students will identify and describe representations of points, lines, line segments, rays, and angles, including endpoints and vertices. Concrete materials and two-dimensional representations will be used to solve problems involving perimeter, patterns, probability, and equivalence of fractions and decimals. Students will recognize images of figures resulting from geometric transformations, such as reflection, translation, and rotation. Students will investigate and describe the associative property for addition and multiplication. 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

Focus: Place Value, Fractions, and Decimals

4.1 The student will

- a) identify orally and in writing the place value for each digit in a whole number expressed through millions;
- b) compare two whole numbers expressed through millions, using symbols ($>$, $<$, or $=$); and
- c) round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.

4.2 The student will

- a) compare and order fractions and mixed numbers;
- b) represent equivalent fractions; and
- c) identify the division statement that represents a fraction.

4.3 The student will

- a) read, write, represent, and identify decimals expressed through thousandths;
- b) round decimals to the nearest whole number, tenth, and hundredth;
- c) compare and order decimals; and
- d) given a model, write the decimal and fraction equivalents.

Computation and Estimation

Focus: Factors and Multiples, and Fraction and Decimal Operations

4.4 The student will

- a) estimate sums, differences, products, and quotients of whole numbers;
- b) add, subtract, and multiply whole numbers;
- c) divide whole numbers, finding quotients with and without remainders; and
- d) solve single-step and multistep addition, subtraction, and multiplication problems with whole numbers.

4.5 The student will

- a) determine common multiples and factors, including least common multiple and greatest common factor;
- b) add and subtract fractions having like and unlike denominators that are limited to 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fractions, using common multiples and factors;
- c) add and subtract with decimals; and
- d) solve single-step and multistep practical problems involving addition and subtraction with fractions and with decimals.

Measurement

Focus: Equivalence within U.S. Customary and Metric Systems

4.6 The student will

- a) estimate and measure weight/mass and describe the results in U.S. Customary and metric units as appropriate; and
- b) identify equivalent measurements between units within the U.S. Customary system (ounces, pounds, and tons) and between units within the metric system (grams and kilograms).

4.7 The student will

- a) estimate and measure length, and describe the result in both metric and U.S. Customary units; and
- b) identify equivalent measurements between units within the U.S. Customary

system (inches and feet; feet and yards; inches and yards; yards and miles) and between units within the metric system (millimeters and centimeters; centimeters and meters; and millimeters and meters).

4.8 The student will

- a) estimate and measure liquid volume and describe the results in U.S. Customary units; and
- b) identify equivalent measurements between units within the U.S. Customary system (cups, pints, quarts, and gallons).

4.9 The student will determine elapsed time in hours and minutes within a 12-hour period.

Geometry

Focus: Representations and Polygons

4.10 The student will

- a) identify and describe representations of points, lines, line segments, rays, and angles, including endpoints and vertices; and
- b) identify representations of lines that illustrate intersection, parallelism, and perpendicularity.

4.11 The student will

- a) investigate congruence of plane figures after geometric transformations, such as reflection, translation, and rotation, using mirrors, paper folding, and tracing; and
- b) recognize the images of figures resulting from geometric transformations, such as translation, reflection, and rotation.

4.12 The student will

- a) define polygon; and
- b) identify polygons with 10 or fewer sides.

Probability and Statistics

Focus: Outcomes and Data

4.13 The student will

- a) predict the likelihood of an outcome of a simple event; and
- b) represent probability as a number between 0 and 1, inclusive.

4.14 The student will collect, organize, display, and interpret data from a variety of graphs.

Patterns, Functions, and Algebra

Focus: Geometric Patterns, Equality, and Properties

4.15 The student will recognize, create, and extend numerical and geometric patterns.

4.16 The student will

- a) recognize and demonstrate the meaning of equality in an equation; and
- b) investigate and describe the associative property for addition and multiplication