Grade Seven

The seventh-grade standards continue to emphasize the foundations of algebra. The standards address the concept of and operations with rational numbers by continuing their study from grade six. Students will build on the concept of ratios to solve problems involving proportional reasoning. Students will solve problems involving volume and surface area and focus on the relationships among the properties of quadrilaterals. Probability is investigated through comparing experimental results to theoretical expectations. Students continue to develop their understanding of solving linear equations and inequalities in one variable by applying the properties of real numbers. Students discern between proportional and non-proportional relationships and begin to develop a concept of slope as rate of change.

The use of appropriate technology and the interpretation of the results from applying technology tools must be an integral part of teaching, learning, and assessment. While learning mathematics, students will be actively engaged, using concrete materials and appropriate technologies to facilitate problem solving. However, facility in the use of technology shall not be regarded as a substitute for a student's understanding of quantitative and algebraic concepts or for proficiency in basic computations.

The acquisition of specialized mathematical vocabulary and language is crucial to a student's understanding and appreciation of the subject and fosters confidence in mathematics communication and problem solving.

Problem solving is integrated throughout the content strands. The development of problem-solving skills is a major goal of the mathematics program at every grade level. The development of skills and problem-solving strategies must be integrated early and continuously into each student's mathematics education.

Number and Number Sense
7.1   The student will
  a) investigate and describe the concept of negative exponents for powers of ten;
  b) compare and order numbers greater than zero written in scientific notation;
  c) compare and order rational numbers;
  d) determine square roots of perfect squares; and
  e) identify and describe absolute value of rational numbers.

Computation and Estimation
7.2   The student will solve practical problems involving operations with rational numbers.

7.3   The student will solve single-step and multistep practical problems, using proportional reasoning.

Measurement and Geometry
7.4   The student will
  a) describe and determine the volume and surface area of rectangular prisms and cylinders; and
  b) solve problems, including practical problems, involving the volume and surface area of rectangular prisms and cylinders.

7.5   The student will solve problems, including practical problems, involving the relationship between corresponding sides and corresponding angles of similar quadrilaterals and triangles.

7.6   The student will
          a)   compare and contrast quadrilaterals based on their properties; and
          b)   determine unknown side lengths or angle measures of quadrilaterals.

7.7   The student will apply translations and reflections of right triangles or rectangles in the coordinate plane.

Probability and Statistics

7.8   The student will
          a)   determine the theoretical and experimental probabilities of an event; and
          b)   investigate and describe the difference between the experimental probability and theoretical probability of an event.

7.9   The student, given data in a practical situation, will
          a)   represent data in a histogram;
          b)   make observations and inferences about data represented in a histogram; and
          c)   compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs.

Patterns, Functions, and Algebra

7.10   The student will
          a)   determine the slope, m, as rate of change in a proportional relationship between two quantities and write an equation in the form $y = mx$ to represent the relationship;
          b)   graph a line representing a proportional relationship between two quantities given the slope and an ordered pair, or given the equation in $y = mx$ form where m represents the slope as rate of change;
          c)   determine the y-intercept, b, in an additive relationship between two quantities and write an equation in the form $y = x + b$ to represent the relationship;
          d)   graph a line representing an additive relationship between two quantities given the y-intercept and an ordered pair, or given the equation in the form $y = x + b$, where b represents the y-intercept; and
          e)   make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.

7.11   The student will evaluate algebraic expressions for given replacement values of the variables.

7.12   The student will solve two-step linear equations in one variable, including practical problems that require the solution of a two-step linear equation in one variable.

7.13   The student will solve one- and two-step linear inequalities in one variable, including practical problems, involving addition, subtraction, multiplication, and division, and graph the solution on a number line.