

# MATHEMATICS CONTENT STANDARDS

## Grade 7

**Standard 1:** Algebraic Reasoning—The student will use number properties to simplify and solve simple linear equations.

1. Identify and apply the commutative, associative, distributive, inverse, and identity properties (e.g.,  $n + 0 = n$ ,  $2(x + 3) = 2x + 6$ ).
2. Use a variety of methods to model and solve 1-step linear equations (e.g., use properties of equality, graph ordered pairs with paper and pencil, use graphing calculators).

**Standard 2:** Number Sense—The student will use numbers and number relationships to acquire basic facts and determine the reasonableness of results.

1. Integers
  - a. Compare and order positive and negative integers and describe their use in real-life situations (e.g., temperature, sea level, stock market fluctuations, football yardage).
  - b. Use the basic operations on integers to solve problems.
2. Ratio, Proportion, and Percents
  - \*a. Demonstrate the concept of ratio and proportion with models (e.g., similar geometric shapes, scale models).
  - b. Set up equivalent ratios, estimate and solve problems using ratio, proportions, and percents including percents greater than 100 and less than 1 (e.g., determine missing sides of similar figures, heart rate per minute, cost per pound, pay to hours worked overtime).
  - c. Solve percent application problems (e.g., discounts, tax, finding the missing value of percent/part/whole).
3. Exponents
  - \*a. Analyze and develop generalizations of exponential patterns, including zero as an exponent, using manipulatives and calculators (e.g., model getting paid a penny the first day, 2 cents the second day, 4 cents the third day...).
  - b. Build and recognize models of multiples to investigate squares and square roots (e.g., build rectangular arrays for numbers 1 to 100 and note which can be represented as squares).
  - c. Estimate the square root of a number (e.g., between two consecutive integers).

**Standard 3: Geometry**—The student will apply the properties and relationships of plane geometry in a variety of contexts.

1. Classifying Geometric Figures
  - a. Classify triangles according to their sides and angles.
  - b. Classify quadrilaterals according to their sides and angles (e.g., determine whether all squares are rectangles).
2. Identify and compare bisectors, interior, exterior, and vertical angles (e.g., using graph paper, software, protractors to measure angles between parallel lines with a transversal).
3. Rectangular Coordinate System
  - a. Locate points on a plane in all four quadrants.
  - b. Identify geometric transformation of figures (rotations, translations, and reflections).

**Standard 4: Measurement**—The student will use measurement to solve problems in a variety of contexts.

1. Area and Perimeter
  - a. Develop area and perimeter concepts (e.g., use grids to estimate the area of irregular shapes).
  - b. Apply formulas to solve problems involving perimeter (circumference) and area of polygons and circles.
2. Customary and Metric Measurements
  - a. Select and use appropriate tools for measurements in practical applications and make reasonable estimates of measurements in a particular situation using the appropriate unit.
  - b. Use estimates to relate customary and metric measurements to each other.

**Standard 5: Data Analysis and Probability**—The student will use probability to formulate and justify predictions from a set of data.

1. Use data from a sample to predict possible outcomes and predict simple probabilities as fractions, decimals, or percents (e.g., the data from lists, tree diagrams, frequency distribution tables, area models).
2. Determine the probability of an event involving “or”, “and”, or “not” (e.g., on a spinner with 1 blue, 3 red, and 2 yellow sections what is the probability of getting a red or a yellow?).
3. Find all possible combinations and permutations involving a limited number of variables.