

MATHEMATICS CONTENT STANDARDS

Grade 5

Standard 1: Patterns and Algebraic Reasoning—The student will use algebraic methods to describe patterns and solve problems in a variety of contexts.

1. Describe rules that produce patterns found in tables, graphs, and models, and use variables (e.g., boxes, letters, pawns, number cubes, or other symbols) to solve problems or to describe general rules in algebraic expression or equation form.
2. Use algebraic problem-solving techniques (e.g., use a balance to model an equation and show how subtracting a number from one side requires subtracting the same amount from the other side) to solve problems.

Standard 2: Number Sense—The student will demonstrate an understanding of the basic concepts and properties of real numbers.

1. Fractions, Decimals and Percents
 - a. Solve problems using decimal numbers to the 1000ths place.
 - b. Compare, convert, and order common fractions and decimals to the 100ths place to solve problems.
 - c. Represent with models the connection between fractions, decimals, and percents and be able to convert from one representation to another (e.g., use 10 x 10 grids, base-10 blocks; limit fractions to halves, fourths, fifths, and tenths).
 - d. Explain verbally with manipulatives and diagrams 25%, 50%, 75%; use these percents to solve problems and relate them to their corresponding fractions and decimals.
2. Basic Number Theory Concepts
 - a. Apply the basic properties of arithmetic: commutative, associative, distributive, and identity (e.g., show $2(5 + 1) = (2 \cdot 5) + (2 \cdot 1)$, given $(5 + 1) + (5 + 1)$ regroup to show this equals $(5 + 5) + (1 + 1)$ concluding with $(2 \cdot 5) + (2 \cdot 1)$) to solve problems.
 - b. Identify and apply factors, multiples, prime, and composite numbers in a variety of problem-solving situations (e.g., build rectangular arrays for numbers 1-100 and classify as prime or composite). Grade 5

Standard 3: Number Operations and Computation—The student will estimate and compute with whole numbers, decimals, and fractions.

1. Estimation
 - a. Use estimation skills to determine solutions to problems involving decimals.
 - b. Apply estimation skills to solve problems involving common percents and equivalent fractions.
2. Whole Numbers, Decimals, and Fractions
 - a. Add and subtract decimal numbers with the same and different place values (e.g., $3.72 + 1.4$) to solve problems.
 - b. Multiply and divide whole numbers and decimal numbers with 1- or 2-digit multipliers or divisors to solve problems.
 - c. Add and subtract fractions and mixed numbers to solve problems using a variety of methods (e.g., use fraction strips, find the least common denominator [LCD]).

Standard 4: Geometry and Measurement—The student will apply geometric properties

and relationships and use measurements within the metric and customary systems to solve problems in a variety of contexts.

1. Identify and describe the basic properties of figures (e.g., two or three-dimensionality, symmetry, number of faces, types of angles).

2. Find the perimeter of simple polygons and area of a rectangle (e.g., use 1-inch tiles to build rectangles of different perimeters and areas).

*3. Use nonstandard units (beans, rice, candies) and standard units (centimeter cubes, 1-inch cubes) to find the volume of rectangular solids and estimate the volume of other solids.

*4. Use the appropriate units and tools to estimate and measure temperature, distance, length, weight, and angles.

5. Convert basic measurements of volume, weight and distance within the same system for metric and customary units (e.g., inches to feet, hours to minutes, centimeters to meters).

Standard 5: Data Analysis and Probability—The student will use data analysis, statistics, and probability to interpret data in a variety of contexts.

1. Data Analysis

a. Analyze data to create and interpret tables and graphs.

b. Justify the selection of the type of table or graph (e.g., a line graph may be more appropriate than a bar graph when displaying the height of a person over time).

c. Compare and translate between displays of data (e.g., multiple sets of data on the same graph, Venn diagrams, a combination of diagrams, charts, tables, graphs).

*d. Formulate questions, design investigations, consider samples, and collect, organize, and analyze data using observation, measurement, surveys, or experiments (e.g., how far can 5th graders throw a softball based on where it first hits the ground?).

e. Determine the range (spread) and the mean (average) of a set of data.

2. Probability

a. Determine the probability of events occurring in familiar contexts or experiments and express probabilities as fractions (e.g., find the fractional probability of an event given a biased spinner).

b. List permutations and combinations of up to five items.