

Essential Concepts for Mathematics – Grade 6

Number and Operation

- Use a variety of estimation strategies and mental math techniques.
- Use technology when appropriate.
- Read and write numerals from thousandths to one billion.
- Express numbers in expanded, scientific and exponential notation.
- Understand prime and composite numbers, exponents, multiples and factors.
- Order and compare whole numbers, fractions, decimals and integers.
- Use the order of operation rules.
- Use rules of divisibility.
- Add, subtract, multiply and divide whole numbers, decimals, and fractions.
- Add and subtract integers.
- Name equivalent forms for fractions, ratios, decimals, and percents.
- Use ratios and proportions.
- Write fractions and ratios in simplest form.
- Select or write a number sentence that can be used to solve a multi-step problem; write a word problem for two-step expressions or equations.

Algebra

- Describe, extend, analyze, and create mathematical patterns.
- Create tables and graphs to represent patterns and algebraic expressions.
- Draw a graph from a table of values (simple linear equations).
- Write an algebraic expression from a graph or a table of values.
- Use variables to stand for an unknown quantity in an expression, equation, or formula.
- Evaluate expressions and formulas substituting given values for the variables.
- Solve two-step equations involving whole numbers and a single variable.

Geometry

- Identify the *midpoint* of a line segment.
- Identify concave and convex polygons.
- Identify the center, radius, diameter, and circumference of a circle.
- Identify the numbers of faces, edges, and vertices of pyramids and prisms.
- Identify, write, and graph the ordered pair for a point in all four quadrants.
- Identify and demonstrate transformations on a coordinate grid and identify the location of the new vertices.

Measurement

- Estimate and calculate length, volume, weight and area using metric and customary units.
- Compare units of standard and metric measure; explain how unit size affects precision.
- Measure length to the nearest one-sixteenth of an inch and to the nearest millimeter.
- Identify π as the ratio of the circumference to the diameter of a circle.
- Calculate the circumference of a circle.
- Estimate and measure an angle to the nearest degree.
- Calculate elapsed time across a.m. and p.m. time periods.
- Calculate area of triangles, rectangles and parallelograms.
- Calculate surface area and volume of right, rectangular prisms.

Data Analysis and Probability

- Collect, compare, display, and evaluate data using bar graphs, line graphs, line plots, circle graphs, and scatter plots.
- Recognize that changing the scale influences the appearance of a display of data.
- Express the results of a probability experiment as a fraction, ratio, or percent