



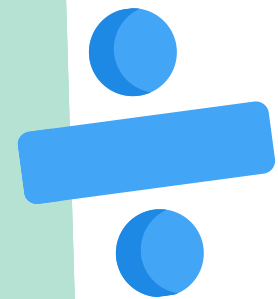
Seventh Grade

Math Curriculum



Pre-Algebra

- **Properties of The Real Numbers**
 - Know and use the associative, commutative, and distributive properties by name and in
 - Simplifying expressions involving numbers and variables. Understand absolute value and evaluate expressions such as $|2x - 3| + 3x$.
- **Linear Applications and Proportionality**
 - Know the concept of slope.
 - Translate situations of proportionality into equations of the form $y = mx$, where m is the constant of proportionality or slope; specifically know and understand $d = rt$ and $i = prt$.
 - Show situations of constant proportionality as a line on the coordinate plane.
 - Introduce the concept of a function and determine the equation of a linear function given its slope and intercepts in the form $y = mx + b$.
 - Estimate the values of b and m from a given linear graph.





Pre-Algebra

- **Polynomial Arithmetic**

- Add, subtract, multiply, and divide monomials and polynomials (divide polynomials by monomials only).

- Factor binomials that have a common monomial factor.

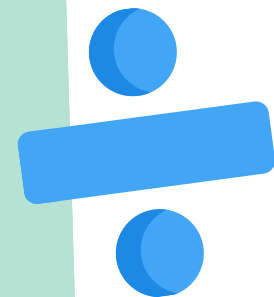
- **Equivalent Equations and Inequalities**

- Review equality properties for equations.

- Know that addition or subtraction of the same value from both sides of an inequality maintains the inequality.

- Know that multiplying or dividing both sides of an inequality by a positive number maintains the inequality, but multiplying or dividing by a negative number reverses the inequality; show why using a number line.

- Simplify and solve linear equations in one variable such as $3(2x - 5) + 4x = 12(x - 3)$.
- Simplify and graph solutions.

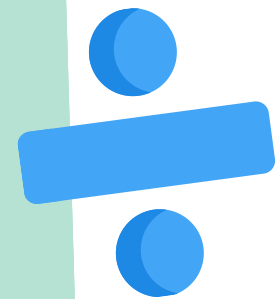


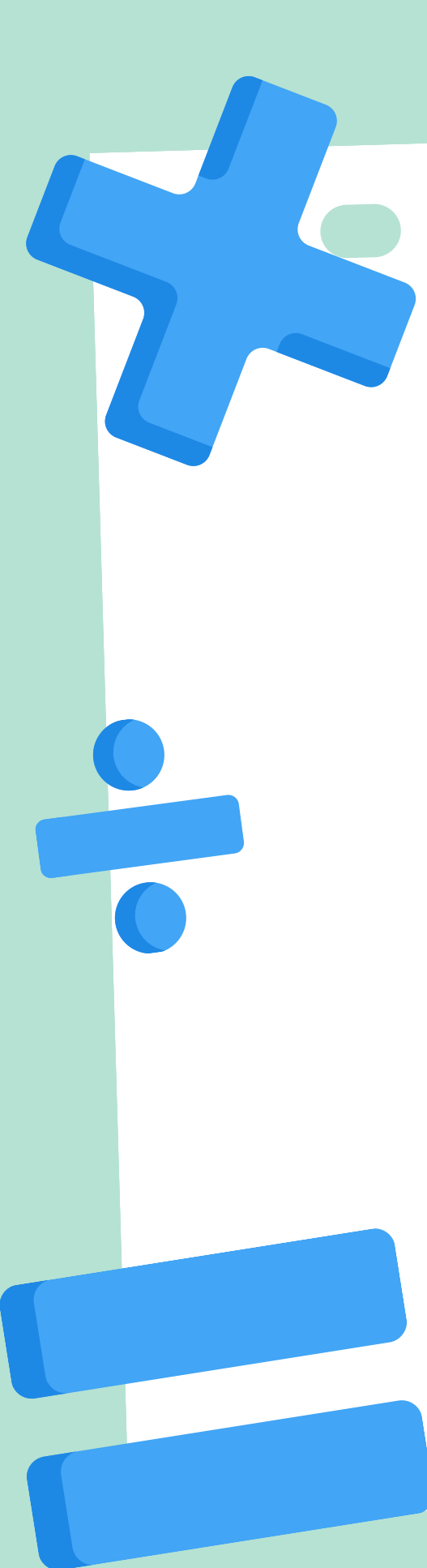


Pre-Algebra

Integer Exponents

- - Know the meaning of an exponent n when n is positive or negative.
 - Know that a non-zero number to the zero power is one.
 - Understand why a negative number to an even power is positive and a negative number to odd power is negative.
 - Know the multiplication properties of exponents:
 - Product of powers: $(a^m)(a^n) = a^{m+n}$
 - Power of a power: $(a^m)^n = a^{mn}$
 - Power of a product: $(ab)^m = (a^m)(b^m)$.
 - Convert decimal numbers to and from scientific notation.
 - Know the proper order of operations with exponents.





Geometry

- **Three-Dimensional Objects**
 - Describe and construct simple right prisms, cylinders, cones, and spheres using the concepts of parallel and perpendicular; calculate the surface areas and volumes of these objects.
 - Know that the section created by the intersection of a plane and a sphere is a circle.
 - Calculate the surface area of a sphere using the equation $SA = 4 \pi r^2$.
 - Calculate the volume of a sphere using the equation $V = (4/3) \pi r^3$
 - **Angle Pairs**
 - Construct parallel lines and a transversal using a compass and straight edge.
 - Understand congruent angles, vertical angles, complementary angles, supplementary angles, adjacent angles, corresponding angles, and alternate interior and alternate exterior angles.
- 

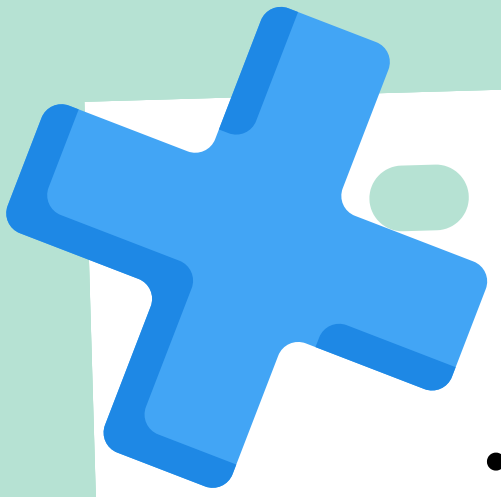


Geometry

Triangles

- - Know that a triangle is determined by its three sides or by two sides and the included angle (SSS and SAS triangle congruence) and solve problems.
 - Use SSS to prove that the construction of the bisector of an angle is valid.
 - Use SSS to prove that the construction of the perpendicular bisector of a segment is valid.
 - Prove that the base angles of an isosceles triangle are congruent.
 - Demonstrate that the sum of the interior angles of a triangle equals 180 degrees.
 - Know that the shape of a triangle is determined by two (hence all three) of its angles (AA(A) triangle similarity) and solve related problems.
 - Construct a circle that circumscribes a triangle using compass and straight edge.
 - Know and understand the Pythagorean Theorem and its converse and use it to find the length of the missing side of a right triangle and lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement and a calculator.
 - Use the Pythagorean Theorem to determine the exact ratios of the sides in 30-60-right triangles and isosceles right triangles.
 - Determine the image of a triangle under translations, rotations, and reflections.

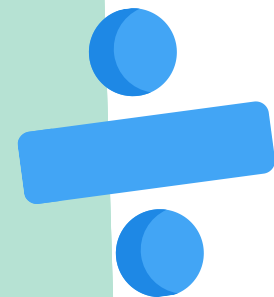




Geometry

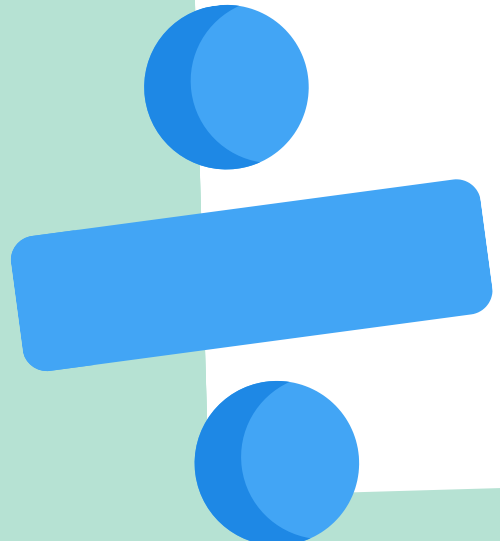
Measurement

- - Choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.
 - Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (for example, miles per hour and feet per second, cubic inches to cubic centimeters).
 - Use measures expressed as rates (for example, speed, density) and measures expressed as products (for example, person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.
 - Compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects.
 - Know how perimeter, area, and volume are affected by changes of scale.
 - Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.
 - Relate the changes in measurement with a change of scale to the units used (for example, square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches of $[1 \text{ ft}^2 = 144 \text{ in}^2]$, 1 cubic inch is approximately 16.38 cubic centimeters $[1 \text{ in}^3 = [16.36 \text{ cm}^3]]$).





Probability and Statistics

- Show the relationship between two variables using a scatterplot and describe the apparent relationship informally.
 - Find the upper and lower quartiles for a data set.
 - Understand that if p is the probability of an event occurring, $1 - p$ is the probability of the event not occurring.
 - Understand the difference between independent and dependent events.
- 
- 
- 
- 
- 