



# Pre-Algebra

## Purpose

Students will become flexible thinkers and complex problem solvers by applying essential mathematical ideas and concepts through a rigorous, focused, and relevant curriculum.

## Philosophy Statement

Students will become flexible thinkers and complex problem solvers by applying essential mathematical ideas and concepts through a rigorous, focused, and relevant curriculum.

# Pre-Algebra

Statement	Exceeds	Secure	Developing	Beginning
Adds, subtracts, multiplies, and divides integers.	*Solve real-world problems involving integers.	Solves problems with integers using all four operations.	Solves problems with integers using two of the four operations.	Understands the relationship of integers on a number line.
Adds, subtracts, multiplies, and divides rational numbers.	*Solve real-world problems involving rational numbers.	Solves problems with rational numbers using all four operations.	Solves problems with rational numbers using two of the four operations.	Understands the relationship of rational numbers on a number line.
Interprets irrational numbers and evaluates radicals.	Applies squared roots to the Pythagorean Theorem.	Approximates squared roots.	Solves squared and basic cubed roots.	Justifies if a number is rational or irrational.
Evaluates radical and integer exponents, and scientific notation.	*Evaluates radicals and integer powers with fractional exponents. *Multiplies and divides with numbers in scientific notation	Evaluates integer exponents (negative exponent, zero exponent, power to a power, multiplying exponents, and dividing exponents with the same base), and evaluates scientific notation.	Evaluates scientific notations or evaluates integer exponents (negative exponent, zero exponent, power to a power, multiplying exponents, and dividing exponents with the same base).	Multiplies and divides exponents with the same base.
Analyzes proportional relationships and uses them to solve problems.	*Sets up proportions to solve real life problems and analyzes percent problems.	Recognizes, describes, and solves proportional relationships with equivalent fractions and cross products and uses proportions to solve percent problems.	Recognizes & describes proportional relationships of proportions with equivalent fractions and sets up proportions for single step percent problems.	Writes two quantities as a ratio in all three ways in simplest form AND finds unit rate AND applies rate and ratio to solve real-world problems.

Applies properties of operations to generate equivalent expressions.	*Applies polynomial operations to complex problems.	Adds and subtracts polynomials (combining like terms with exponents).	Simplifies expressions using like terms including using the distributive property.	Identifies like terms in expressions.
Solves problems using numerical and algebraic equations.	*Solves equations with variables on both sides and/or distributing fractions when solving	Solves multi-step equations with rational numbers including situations with one solution, many solutions, or no solutions (distributive property and combining like terms).	Solves two-step equations with rational numbers.	Solves one-step equations with rational numbers.
Solve problems using numerical and algebraic inequalities.	*Solves absolute value inequalities or linear inequalities	Solve multi-step inequalities with rational numbers and graph solutions on a number line.	Solves and graphs two-step inequalities	Solves and graphs one-step inequalities
Uses properties of a line to demonstrate knowledge of linear equations.	*Write an equation from standard form to slope-intercept form.	Write a linear equation to represent a line on a graph.	Given an equation in slope-intercept form, graph the line of a linear equation.	Identify unit rate as a slope of a line.
Uses random sampling to draw inferences about populations.	Justifies how changing one or more data points would alter the statistical data.	Uses a visual model (stem-and-leaf, box-and whisker, circle graph) to compare two or more populations.	Compares two populations using mean, median, mode, and range.	Understands that samples are subsets of populations.
Investigates chance processes through probability models.	*Uses probability to find odds or odds to find probability.	Determines probability of compound independent and/or dependent events.	Determines probability of simple events.	Understands the difference between theoretical and experimental probability.

Draws, constructs, describes, and compares geometrical figures.	*Uses their understanding of relationships between geometrical figures to design & construct architectural structures.	Creates scale drawings and constructs triangles given three measures while noting if the conditions form a unique triangle, more than one triangle, or no triangle.	Creates scale drawings or constructs triangles given three measures.	Identifies basic geometric 3-dimensional figures and the cross section resulting from slicing a 3-dimensional figure.
Solves problems involving angle measure, area, surface area, and volume.	*Uses various methods of problem solving to determine surface area and volume of irregular figures.	Solves real life and mathematical problems involving angle measure, area, circumference, surface area, and volume with pyramids, cones, and spheres.	Determines surface area of basic 3-dimensional figures.	Determines the area of basic 2-dimensional figures.
Creates and manipulates transformations.	*Determines coordinates for figures that have been transformed or dilated on a coordinate plane	Prove similarity of two figures using dilations, reflections, rotations, and/or translations.	Prove congruency of two figures by naming the translation, reflection, and/or rotation from one figure to the next	Create a translation, reflection, and/or rotation on a coordinate plane

*The asterisk (\*) denotes one possible way a student could demonstrate enrichment or extension that would be designated as Exceeds Standard.*