

Pre-Algebra Essential Curriculum

UNIT I:

STANDARD 6.0 – KNOWLEDGE OF NUMBER RELATIONSHIPS AND COMPUTATION/ARITHMETIC

Goal 1. The student will demonstrate the ability to apply knowledge of rational numbers and place value.

Objectives - The student will be able to:

1. Compare, order, and describe rational numbers with and without relational symbols ($<$, $>$, $=$).
2. Read, write, and represent rational numbers.

Goal 2. The student will demonstrate the ability to analyze number relations and compute.

Objectives - The student will be able to:

1. Add, subtract, multiply, and divide integers.
2. Identify and use the laws of exponents to simplify expressions.
3. Calculate powers of integers and square roots of perfect square whole numbers.
4. Estimate the square roots of whole numbers.

STANDARD 1.0 – KNOWLEDGE OF ALGEBRA, PATTERNS, AND FUNCTIONS

Goal 1. The student will demonstrate the ability to write, simplify, and evaluate expressions.

Objectives - The student will be able to:

1. Evaluate numeric expressions using the order of operations.
2. Evaluate algebraic expressions.
3. Write algebraic expressions to represent unknown quantities.
4. Describe a real-world situation represented by an algebraic expression.
5. Use properties of addition and multiplication to simplify expressions.
6. Simplify algebraic expressions by combining like terms.

Goal 2. The student will demonstrate the ability to identify, write, solve, and apply equations and inequalities.

Objectives - The student will be able to:

1. Write equations to represent relationships.
2. Solve for the unknown in a linear equation.
3. Identify equivalent equations.
4. Apply given formulas to a problem-solving situation.

UNIT II:

STANDARD 1.0 – KNOWLEDGE OF ALGEBRA, PATTERNS, AND FUNCTIONS

Goal 2. The student will demonstrate the ability to identify, describe, extend, and create patterns, functions, and sequences.

Objectives - The student will be able to:

1. Write inequalities to represent relationships.
2. Solve for the unknown in an inequality.
3. Identify or graph solutions of inequalities on a number line.

UNIT III:

STANDARD 1.0 – KNOWLEDGE OF ALGEBRA, PATTERNS, AND FUNCTIONS

Goal 2. The student will demonstrate the ability to identify, describe, extend, and create patterns, functions, and sequences.

Objectives - The student will be able to:

1. Determine the recursive relationship of arithmetic sequences represented in words, in a table, or in a graph.
2. Determine the recursive relationship of geometric sequences represented in words, in a table, or in a graph.

Goal 3. The student will demonstrate the ability to locate points on a number line and in a coordinate plane.

Objectives - The student will be able to:

1. Graph linear equations in a coordinate plane.

Goal 4. The student will demonstrate the ability to analyze relationships.

Objectives - The student will be able to:

1. Determine the slope of a graph in a linear relationship.
2. Determine the slope of a linear relationship represented numerically or algebraically.

STANDARD 3.0 – KNOWLEDGE OF MEASUREMENT

Goal 2. The student will demonstrate the ability to analyze measurement relationships.

Objectives - The student will be able to:

1. Determine whether relationships are linear or nonlinear when represented in words, in a table, symbolically, or in a graph.
2. Determine whether relationships are linear or nonlinear when represented symbolically.

UNIT IV:

STANDARD 6.0 – KNOWLEDGE OF NUMBER RELATIONSHIPS AND COMPUTATION/ARITHMETIC

Goal 1. The student will demonstrate the ability to analyze ratios, proportions, and percents.

Objectives - The student will be able to:

1. Determine unit rates.
2. Solve problems using proportional reasoning.
3. Use proportional reasoning to solve measurement problems.
4. Determine the uses of percents, rates of increase or decrease, discount, commission, sales tax, and simple interest in the context of a problem.

UNIT V:

STANDARD 2.0 – KNOWLEDGE OF GEOMETRY

Goal 1. The student will demonstrate the ability to analyze the properties of plane geometric figures.

Objectives - The student will be able to:

1. Identify and describe geometric relationships between angles formed when parallel lines are cut by a transversal.
2. Identify and describe the relationship among the parts of a right triangle.

Goal 2. The student will demonstrate the ability to analyze geometric relationships.

Objectives - The student will be able to:

1. Determine the measurements of angles formed by parallel lines cut by a transversal.
2. Apply right angle concepts to solve real-world problems.
3. Determine whether three given side lengths form a right triangle.

Goal 3. The student will demonstrate the ability to represent plane geometric figures.

Objectives - The student will be able to:

1. Draw quadrilaterals.
2. Construct perpendicular line segments.
3. Construct triangles.

Goal 4. The student will demonstrate the ability to apply the properties of similar polygons.

Objectives - The student will be able to:

1. Determine similar parts of polygons.

Goal 5. The student will demonstrate the ability to analyze a transformation on a coordinate plane.

Objectives - The student will be able to:

1. Identify, describe, and plot the results of multiple transformations in a coordinate

plane.

UNIT VI:

STANDARD 3.0 – KNOWLEDGE OF MEASUREMENT

Goal 1. The student will demonstrate the ability to estimate and apply measurement formulas.

Objectives - The student will be able to:

1. Estimate and determine the circumference and area of a circle.
2. Estimate and determine the area of a composite figure.
3. Estimate and determine the volume of a cylinder.
4. Determine the volume of cones, pyramids, and spheres.
5. Determine the surface area of cylinders, prisms, and pyramids.

UNIT VII:

STANDARD 3.0 – KNOWLEDGE OF STATISTICS

Goal 1. The student will demonstrate the ability to organize and display data.

Objectives - The student will be able to:

1. Organize and display data to make a box-and-whisker plot and multiple box-and-whisker plots.
2. Organize and display data to make a histogram.

Goal 2. The student will demonstrate the ability to analyze data.

Objectives - The student will be able to:

1. Analyze multiple box-and-whisker plots using the same scale.

UNIT VIII:

STANDARD 1.0 – KNOWLEDGE OF ALGEBRA, PATTERNS, OR FUNCTIONS

Goal 1. The student will demonstrate the ability to write, simplify, and evaluate expressions.

Objectives - The student will be able to:

1. Evaluate numeric expressions using the order of operations with rational numbers.
2. Evaluate algebraic expressions with rational numbers.
3. Translate verbal sentences into equations and equations into verbal sentences.
4. Write equations and inequalities that describe real-world problems.

Goal 2. The student will demonstrate the ability to identify, write, solve, and apply equations and inequalities.

Objectives - The student will be able to:

1. Solve equations involving rational numbers with more than one equation.
2. Solve equations involving rational numbers with the variable on each side.
3. Solve equations for given variables and use formulas to solve real-world problems.
4. Solve inequalities involving rational numbers with more than one operation.

Goal 3. The student will demonstrate the ability to analyze linear equations.

Objectives - The student be able to:

1. Determine the slope of a line given two points.
2. Analyze the slope as a rate of change in the context of a real-world situation.
3. Write and graph linear equations in slope-intercept form.

STANDARD 6.0 – KNOWLEDGE OF NUMBER RELATIONSHIPS AND COMPUTATION/ARITHMETIC

Goal 1. The student will demonstrate the ability to apply knowledge of rational numbers and place value.

Objectives - The student will be able to:

1. Add, subtract, multiply, and divide rational numbers.