

# Pre-Algebra

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**At the end of the school year, students will be able to...**

**GOAL 6**  
**Numbers Sense and Computations**

**Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.**

**STANDARD A**

**Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.**

- \_\_\_\_\_ Identify characteristics of natural numbers, whole numbers, integers, rational numbers, irrational numbers and the real number system.
- \_\_\_\_\_ Locate and graph real numbers on a number line.
- \_\_\_\_\_ Determine equivalent forms for fractions, decimal fractions, percent and ratios.
- \_\_\_\_\_ Compare ratios and identify proportions.
- \_\_\_\_\_ Identify and use the associative, commutative, distributive, identity and zero product properties.
- \_\_\_\_\_ Explore simplifying radical expressions.
- \_\_\_\_\_ Identify and convert numbers between standard form and scientific notation.

**STANDARD B**

**Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication and division) and their properties, algorithms, and relationships.**

- \_\_\_\_\_ Perform computations with real numbers.
- \_\_\_\_\_ Analyze and determine appropriate operations to solve problems.
- \_\_\_\_\_ Evaluate algebraic expressions using order of operations and positive integral exponents.

**STANDARD C**

**Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.**

- \_\_\_\_\_ Select and use appropriate operations, methods and tools to compute or estimate with real numbers.
- \_\_\_\_\_ Select and use appropriate operations and techniques of estimating and rounding.
- \_\_\_\_\_ Determine if the conclusion is reasonable for the given set of information.

**STANDARD D**

**Solve problems using comparisons of quantities, ratios, proportions and percents.**

- \_\_\_\_\_ Solve a variety of multi-step problems.

## GOAL 7 Measurement

**Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.**

### STANDARD A

**Measure and compare quantities using appropriate units, instruments, and methods.**

- \_\_\_\_\_ Use units and scale factors to model real world applications.
- \_\_\_\_\_ Measure angles using a protractor.
- \_\_\_\_\_ Measure length using English and metric system.
- \_\_\_\_\_ Find perimeter, area, volume, time, temperature and rate.

### STANDARD B

**Estimate measurements and determine acceptable levels of accuracy.**

- \_\_\_\_\_ Estimate measurements using appropriate methods and units.

### STANDARD C

**Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.**

- \_\_\_\_\_ Apply formulas to solve measurement applications.
- \_\_\_\_\_ Convert measurement units.
- \_\_\_\_\_ Make indirect measurements including heights and distances using proportions.
- \_\_\_\_\_ Select and use appropriate technology and instruments to solve problems and communicate results.

## GOAL 8 Algebra

**Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.**

### STANDARD A

**Describe numerical relationships using variables and patterns.**

- \_\_\_\_\_ Convert repeating decimals to fractions.
- \_\_\_\_\_ Represent situations using algebraic expressions and sentences.
- \_\_\_\_\_ Translate verbal phrases and sentences into algebraic expressions and sentences.
- \_\_\_\_\_ Evaluate and simplify algebraic expressions (order of operations).

### STANDARD B

**Interpret and describe numerical relationships using tables, graphs and symbols.**

- \_\_\_\_\_ Graph linear equations using value tables and slope.
- \_\_\_\_\_ Graph linear inequalities on a number line.
- \_\_\_\_\_ Identify components of and relationships of points on the coordinate plane.
- \_\_\_\_\_ Explore graphing inequalities and systems of equations and inequalities.
- \_\_\_\_\_ Use, interpret and graph equations, inequalities and functions.

**STANDARD C** Solve problems using systems of numbers and their properties.

- \_\_\_\_\_ Write equations and inequalities for given conditions.
- \_\_\_\_\_ Formulate mathematical models to solve real life problems.

**STANDARD D** Using algebraic concepts and procedures to represent problem solving.

- \_\_\_\_\_ Formulate algebraic models to solve real life problems.
- \_\_\_\_\_ Solve linear equations and inequalities.
- \_\_\_\_\_ Explore solving systems of equations graphically.

**GOAL 9 Geometry** Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

**STANDARD A** Demonstrate and apply geometric concepts involving points, lines, planes and solids.

- \_\_\_\_\_ Identify basic geometric figures and terms.
- \_\_\_\_\_ Construct congruent line segments and angles, perpendicular bisectors of line segments, and angle bisectors.

**STANDARD B** Identify, describe, classify and compare relationships using points, lines, planes and solids.

- \_\_\_\_\_ Identify congruent and similar triangles and their corresponding parts.
- \_\_\_\_\_ Identify and draw transformations (translations, reflections, and rotations).
- \_\_\_\_\_ Identify and classify angle relationships for parallel lines and a transversal.
- \_\_\_\_\_ Identify and classify polygons, circles and polyhedra and their components.
- \_\_\_\_\_ Apply relationships of geometric figures to reach conclusions (45-45-90, and 30-60-90 special triangles).
- \_\_\_\_\_ Apply the Pythagorean Theorem and its converse.

**STANDARD C** Construct convincing arguments and proofs to solve problems.

- \_\_\_\_\_ Analyze and select appropriate geometric relationships to solve problems.

**STANDARD D** Use trigonometric ratios and circular functions to solve problems.

- \_\_\_\_\_ Identify sine, cosine, and tangent ratios in right triangles.
- \_\_\_\_\_ Use the basic trigonometric functions in right triangles to find missing angles and sides.

**GOAL 10 Data Collection and Statistical Analysis**

**Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.**

**STANDARD A Organize, describe, and make predictions from existing data.**

- \_\_\_\_\_ Find the mean, median and mode and range for a set of data.
- \_\_\_\_\_ Draw and interpret bar, line and circle graphs.
- \_\_\_\_\_ Use tables, graphs, charts, and surveys to draw conclusions to make predictions.

**STANDARD B Formulate questions, design data collection methods, gather and analyze data and communicate findings.**

- \_\_\_\_\_ Collect, organize, analyze and interpret information to communicate finding.
- \_\_\_\_\_ Determine what conclusions are valid from a given set of information.

**STANDARD C Determine, describe and apply the probabilities of events.**

- \_\_\_\_\_ Determine probabilities and compute statistics to make predictions and inferences.
- \_\_\_\_\_ Find or predict the number of outcomes using “counting”.
- \_\_\_\_\_ Use permutations or combinations to determine the number of outcomes.