

Freshman Year: Algebra I

- **Textbook:**
Algebra I, Common Core Edition
Larson, Boswell, Kanold, Stiff
Holt McDougal
2012
- **Prerequisites:** Students are expected to have a knowledge of Pre-Algebra and proficiency of basic math skills including: positive and negative numbers, multiplication, division, subtraction, addition, fractions, and decimals.
- **Course Description:** This course is designed to introduce students to basic Algebra. Students will learn to manipulate and solve equations for variables. They will be able to solve real world application problems and use introductory probability, statistics, and geometry.
- **Calculator Policy:** A TI-84 (any version) is required for this course. Students will use the calculator for investigations and to solve problems. Students will be expected to understand how to solve some problems both without the calculator and with the calculator. However, students should not expect to be able to use their calculator on every quiz, test, and homework assignment.
- **Course Goals:**
 1. To introduce students into the language of mathematics.
 2. To provide the skills necessary to simplify quantities.
 3. To develop the skills necessary to solve linear and quadratic equations.
 4. To prepare students for Algebra II.
 5. To enable students to solve problems both with and without a calculator.
- **Course Objectives:**

Upon completion of the course, students will be able to:

 1. Use variables to solve problems.
 2. Use square roots.
 3. Manipulate variables and equations.
 4. Perform the four basic operations in order to solve for a variable.
 5. Use the order of operations.
 6. Use the distributive property.
 7. Apply the properties of exponents.
 8. Solve linear equations and solve linear inequalities.
 9. Graph linear equations and linear inequalities.
 10. Find slope, y-intercept, and equations of lines.
 11. Find domain and range of a function.
 12. Identify parallel, horizontal, perpendicular, and vertical lines.
 13. Solve quadratic equations.
 14. Simplify.

15. Factor.
16. Work with absolute values.
17. Identify and recognize functions.
18. Solve a system of linear equations

Course Sequence:

I. Expressions, Equations, and Functions

- a. Evaluate Expressions
- b. Apply Order of Operations
- c. Write Expressions
- d. Write Equations and Inequalities
- e. Use a Problem Solving Plan
- f. Use Precision and Measurement
- g. Represent Functions as Rules and Tables
- h. Represent Functions as Graph

II. Solving Linear Equations

- a. Find Square Roots and Compare Real Numbers
- b. Solve One-Step Equations
- c. Solve Two-Step Equations
- d. Solve Multi-Step Equations
- e. Solve Equations with Variables on Both Sides
- f. Write Ratios and Proportions
- g. Solve Proportions Using Cross Products
- h. Rewrite Equations and Formulas

III. Graphing Linear Equations and Functions

- a. Plot Points in a Coordinate Plane
- b. Graph Linear Equations
- c. Graph Using Intercepts
- d. Find Slope and Rate of Change
- e. Graph Using Slope-Intercept Form
- f. Model Direct Variation
- g. Graph Linear Functions

IV. Writing Linear Equations

- a. Write Linear Equations in Slope-Intercept Form
- b. Use Linear Equations in Slope-Intercept Form
- c. Write Linear Equations in Point-Slope Form
- d. Write Linear Equations in Standard Form
- e. Write Equations of Parallel and Perpendicular Lines
- f. Fit a Line to Data
- g. Predict with Linear Models

V. Solving and Graphing Linear Inequalities

- a. Solve Inequalities Using Addition and Subtraction

- b. Solve Inequalities Using Multiplication and Division
- c. Solve Multi-Step Inequalities
- d. Solve Compound Inequalities
- e. Solve Absolute Value Equations
- f. Solve Absolute Value Inequalities
- g. Graph Linear Inequalities in Two Variables

VI. Systems of Equations and Inequalities

- a. Solve Linear Systems by Graphing
- b. Solve Linear Systems by Substitution
- c. Solve Linear Systems by Adding or Subtracting
- d. Solve Linear Systems by Multiplying First
- e. Solve Special Types of Linear Systems
- f. Solve Systems of Linear Inequalities

VII. Exponents and Exponential Functions

- a. Apply Exponent Properties Involving Products
- b. Apply Exponent Properties Involving Quotients
- c. Define and Use Zero and Negative Exponents
- d. Write and Graph Exponential Growth Functions
- e. Write and Graph Exponential Decay Functions

VIII. Polynomials and Factoring

- a. Add and Subtract Polynomials
- b. Multiply Polynomials
- c. Find Special Products of Polynomials
- d. Solve Polynomial Equations in Factored Form
- e. Factor $x^2 + bx + c$
- f. Factor $ax^2 + bx + c$
- g. Factor Special Products
- h. Factor Polynomials Completely

IX. Quadratic Equations and Functions

- a. Graph $y = ax^2 + c$
- b. Graph $y = ax^2 + bx + c$
- c. Solve Quadratic Equations by Graphing
- d. Use Square Roots to Solve Quadratic Equations
- e. Solve Quadratic Equations by Completing the Square
- f. Solve Quadratic Equations by the Quadratic Formula
- g. Solve Systems with Quadratic Equations
- h. Compare Linear, Exponential, and Quadratic Models
- i. Model Relationships

X. Data Analysis (if time allows)

- a. Analyze Surveys and Samples
- b. Use Measures of Central Tendency and Dispersion

- c. Analyze Data
- d. Interpret Stem-and-Leaf Plots and Histograms
- e. Interpret Box-and-Whisker Plots

XI. Probability

- a. Find Probabilities and Odds
- b. Find Probabilities Using Permutations
- c. Find Probabilities Using Combinations
- d. Find Probabilities of Disjoint and Overlapping Events
- e. Find Probabilities of Independent and Dependent Events

Evaluation: The evaluation procedures vary by teachers, but typically include a combination of homework, quizzes, and tests. Some teachers also collect and review student notes.
