

Prep 8 Year: Pre-Algebra

- **Textbook:** Larson, Boswell, Kanold & Stiff.
Pre-Algebra. Common Core Edition
Holt McDougal, 2012.
- **Course Description:** The students entering prep year have differing ranges of exposure to and skill with mathematics. By covering a wide range of topics, this course ensures that all students in the prep year have the skills necessary to succeed in Algebra I.

The course begins with a review of the fundamentals of working with numbers. Students learn about decimals, negatives, powers, fractions, percentages, units of measurements, conversions of measurements, and analyzing graphs. Geometry is also introduced. Students will go over angles, how to compute area, volume, and surface area of several shapes, polygons, perimeter, dimensions, reflections, translations, size changes, and similar figures. As algebraic techniques are introduced, students learn to apply those techniques to solve problems including distance/rate/time problems, probability, uses of variables, algebraic equations, graphing equations, and proportional thinking.

Calculators are not allowed in this course.

- **Course Goals:**
 1. Provide students with a solid foundation in working with numbers (powers, roots, percents, ratios, fractions, decimals, signed numbers, etc.)
 2. Students will learn to solve basic algebraic equations.
 3. Students will be able to create a formula for and compute: the area of geometric shapes, the volume of three-dimensional solids, and the surface area of three-dimensional solids.
 4. Students will learn to translate word problems into algebraic equations and solve the algebraic equation.
 5. Ensure that all students are prepared for Algebra I.

- **Course Outline/Sequence:**

A. Chapter 1: Variables, Expressions, and Integers

- 1.1 Expressions and Variables
- 1.2 Powers and Exponents
- 1.3 Order of Operations
- 1.4 Comparing and Ordering Integers
- 1.5 Adding Integers
- 1.6 Subtracting Integers
- 1.7 Multiplying and Dividing Integers
- 1.8 The Coordinate Plane

B. Chapter 2: Solving Equations

- 2.1 Properties and Operations

- 2.2 The Distributive Property
- 2.3 Simplifying Variable Expressions
- 2.4 Variables and Equations
- 2.5 Solving Equations Using Addition or Subtraction
- 2.6 Solving Equations Using Multiplication or Division
- 2.7 Decimal Operations and Equations with Decimals

C. Chapter 3: Multi-Step Equations and Inequalities

- 3.1 Solving Two-Step Equations
- 3.2 Solving Equations Having Like Terms and Parentheses
- 3.3 Solving Equations with Variables on Both Sides
- 3.4 Solving Inequalities Using Addition or Subtraction
- 3.5 Solving Inequalities Using Multiplication or Division
- 3.6 Solving Multi-Step Equations

D. Chapter 4: Factors, Fractions, and Exponents

- 4.1 Factors and Prime Factorization
- 4.2 Greatest Common Factor
- 4.3 Equivalent Fractions
- 4.4 Least Common Multiple
- 4.5 Rules of Exponents
- 4.6 Negative and Zero Exponents
- 4.7 Scientific Notation

E. Chapter 5: Patterns Leading to Addition

- 5.1 Rational Numbers
- 5.2 Adding and Subtracting Like Fractions
- 5.3 Adding and Subtracting Unlike Fractions
- 5.4 Multiplying Fractions
- 5.5 Dividing Fractions
- 5.6 Using Multiplicative Inverses to Solve Equations
- 5.7 Equations and Inequalities with Rational Numbers

F. Chapter 6: Ratio and Proportion

- 6.1 Ratios and Rates
- 6.2 Writing and Solving Proportions
- 6.3 Solving Proportions Using Cross Products
- 6.4 Similar and Congruent Figures
- 6.5 Similarity and Measurement
- 6.6 Scale Drawings

G. Chapter 7: Percents

- 7.1 Percents and Fractions
- 7.2 Percents and Proportions
- 7.3 Percents and Decimals
- 7.4 The Percent Equation

- 7.5 Percent of Change
- 7.6 Percent Applications
- 7.7 Simple and Compound Interest

H. Chapter 8: Linear Functions

- 8.1 Relations and Functions
- 8.2 Linear Equations in Two Variables
- 8.3 Using Intercepts
- 8.4 The Slope of a Line
- 8.5 Slope-Intercept Form
- 8.6 Writing Linear Equations
- 8.7 Function Notation
- 8.8 Systems of Linear Equations
- 8.9 Graphs of Linear Inequalities

I. Chapter 9: Real Numbers and Right Triangles

- 9.1 Square Roots
- 9.2 Simplifying Square Roots
- 9.3 The Pythagorean Theorem
- 9.4 Real Numbers
- 9.5 The Distance and Midpoint Formulas
- 9.6 Special Right Triangles

J. Chapter 10: Measurement, Area, and Volume

- 10.1 Triangles
- 10.2 Polygons and Quadrilaterals
- 10.3 Areas of Parallelograms and Trapezoids
- 10.4 Circumference and Area of a Circle
- 10.5 Surface Areas of Prisms and Cylinders
- 10.6 Surface Areas of Pyramids and Cones
- 10.7 Volumes of Prisms and Cylinders
- 10.8 Volumes of Pyramids and Cones

K. Chapters 6 & 11: Data Analysis and Probability

- 11.1 Stem-and-Leaf Plots and Histograms
- 11.2 Box-and-Whisker Plots
- 11.3 Using Data Displays
- 11.4 Collecting Data
- 11.5 Interpreting Data
- 6.7 Probability and Odds
- 6.8 The Multiplication Principle
- 11.8 Probabilities of Disjoint and Overlapping Events
- 11.9 Independent and Dependent Events

L. Chapter 12: Angle Relationships and Transformations (if time allows)

- 12.1 Angle Relationships

12.2 Angles and Parallel Lines
12.3 Angles and Polygons
12.4 Translations
12.5 Reflections and Symmetry
12.6 Rotations and Symmetry
12.7 Dilations

- **Course Method:** The method varies by teacher, but typically includes review of previous homework assignments, introduction of new material, working through example problems, and assignment of new homework. Frequency of quizzes and tests varies by teacher.
- **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.
- **Supplemental Material:** Varies by teacher.

