

# Noble Learners - Pre-Algebra Curriculum

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## Chapter 1: The Tools of Algebra

### Lesson 1.1: Introduction to Variables and Expressions

- Understanding Variables
- Writing Algebraic Expressions
- Evaluating Expressions

### Lesson 1.2: Order of Operations

- Introduction to PEMDAS
- Applying Order of Operations
- Complex Expressions

### Lesson 1.3: Properties of Numbers

- Commutative Property
- Associative Property
- Distributive Property

### Lesson 1.4: Simplifying Expressions

- Combining Like Terms
- Using the Distributive Property
- Simplifying Complex Expressions

## Chapter 2: Integers

### Lesson 2.1: Understanding Integers

- Positive and Negative Numbers
- Number Line Representation
- Absolute Value

### Lesson 2.2: Adding and Subtracting Integers

- Rules for Addition
- Rules for Subtraction
- Real-World Applications

### **Lesson 2.3: Multiplying and Dividing Integers**

- Rules for Multiplication
- Rules for Division
- Solving Problems

### **Lesson 2.4: Integer Word Problems**

- Translating Words to Equations
- Solving Word Problems
- Practice with Real-Life Scenarios

## **Chapter 3: Equations**

### **Lesson 3.1: Understanding Equations**

- Definition of an Equation
- Solutions to an Equation
- Balancing Equations

### **Lesson 3.2: Solving One-Step Equations**

- Addition and Subtraction Equations
- Multiplication and Division Equations
- Practice Problems

### **Lesson 3.3: Solving Two-Step Equations**

- Combining Like Terms
- Using the Distributive Property
- Solving for the Variable

### **Lesson 3.4: Word Problems with Equations**

- Setting Up Equations from Word Problems
- Solving and Interpreting Solutions
- Practice with Various Scenarios

## **Chapter 4: Factors and Fractions**

### **Lesson 4.1: Factors and Multiples**

- Finding Factors
- Finding Multiples
- Prime Factorization

## **Lesson 4.2: Greatest Common Divisor (GCD)**

- Definition and Examples
- Finding GCD Using Prime Factorization
- Solving Problems

## **Lesson 4.3: Least Common Multiple (LCM)**

- Definition and Examples
- Finding LCM Using Prime Factorization
- Solving Problems

## **Lesson 4.4: Simplifying Fractions**

- Simplifying Fractions to Lowest Terms
- Equivalent Fractions
- Practice Problems

## **Chapter 5: Rational Numbers**

### **Lesson 5.1: Understanding Rational Numbers**

- Definition of Rational Numbers
- Representing Rational Numbers on a Number Line
- Converting Between Fractions and Decimals

### **Lesson 5.2: Adding and Subtracting Rational Numbers**

- Adding Rational Numbers
- Subtracting Rational Numbers
- Practice Problems

### **Lesson 5.3: Multiplying and Dividing Rational Numbers**

- Multiplying Rational Numbers
- Dividing Rational Numbers
- Solving Problems

### **Lesson 5.4: Rational Number Word Problems**

- Setting Up and Solving Word Problems
- Real-World Applications
- Practice Scenarios

## **Chapter 6: Ratio, Proportion, and Percent**

### **Lesson 6.1: Understanding Ratios**

- Definition of a Ratio
- Writing and Simplifying Ratios
- Practice Problems

### **Lesson 6.2: Proportions**

- Setting Up Proportions
- Solving Proportions
- Applications in Real Life

### **Lesson 6.3: Understanding Percent**

- Definition of Percent
- Converting Between Fractions, Decimals, and Percent
- Practice Problems

### **Lesson 6.4: Solving Percent Problems**

- Finding the Percent of a Number
- Solving Real-World Percent Problems
- Practice Scenarios

## **Chapter 7: Equations and Inequalities**

### **Lesson 7.1: Solving Equations**

- Review of One-Step and Two-Step Equations
- Solving Multi-Step Equations
- Practice Problems

### **Lesson 7.2: Understanding Inequalities**

- Definition and Symbols
- Graphing Inequalities on a Number Line
- Practice Problems

### **Lesson 7.3: Solving Inequalities**

- One-Step Inequalities
- Two-Step Inequalities
- Practice Problems

### **Lesson 7.4: Word Problems with Inequalities**

- Setting Up Inequality Problems
- Solving and Interpreting Solutions
- Practice Scenarios

## **Chapter 8: Functions and Graphing**

### **Lesson 8.1: Understanding Functions**

- Definition of a Function
- Function Notation
- Evaluating Functions

### **Lesson 8.2: Graphing Linear Functions**

- Plotting Points on a Coordinate Plane
- Understanding Slope and Intercept
- Graphing Linear Equations

### **Lesson 8.3: Analyzing Graphs**

- Interpreting Graphs of Functions
- Identifying Key Features
- Practice Problems

### **Lesson 8.4: Function Word Problems**

- Setting Up Functions from Word Problems
- Solving and Graphing Solutions
- Practice Scenarios

## **Chapter 9: Real Numbers and Right Triangles**

### **Lesson 9.1: Real Numbers**

- Definition and Classification
- Real Number Line
- Properties of Real Numbers

### **Lesson 9.2: The Pythagorean Theorem**

- Understanding the Theorem
- Applying the Theorem
- Solving Right Triangle Problems

### **Lesson 9.3: Distance and Midpoint**

- Finding Distance Between Points
- Finding the Midpoint
- Practice Problems

### **Lesson 9.4: Applications of Right Triangles**

- Real-World Scenarios
- Problem-Solving with Right Triangles
- Practice Problems

## **Chapter 10: Two-Dimensional Figures**

### **Lesson 10.1: Classifying Angles**

- Types of Angles
- Angle Relationships
- Practice Problems

### **Lesson 10.2: Polygons**

- Classifying Polygons
- Properties of Polygons
- Practice Problems

### **Lesson 10.3: Area and Perimeter**

- Calculating Area and Perimeter
- Various Shapes
- Real-World Applications

### **Lesson 10.4: Circles**

- Understanding Radius, Diameter, and Circumference
- Calculating Area and Circumference
- Practice Problems

## **Chapter 11: Three-Dimensional Figures**

### **Lesson 11.1: Solids and Nets**

- Identifying 3D Figures
- Drawing Nets
- Practice Problems

### **Lesson 11.2: Surface Area**

- Calculating Surface Area of Various Solids
- Practice Problems
- Real-World Applications

### **Lesson 11.3: Volume**

- Calculating Volume of Various Solids
- Practice Problems
- Real-World Applications

### **Lesson 11.4: Composite Figures**

- Understanding and Solving for Composite Figures
- Practice Problems
- Real-World Applications

## **Chapter 12: More Statistics and Probability**

### **Lesson 12.1: Data Representation**

- Reading and Creating Graphs
- Interpreting Data
- Practice Problems

### **Lesson 12.2: Measures of Central Tendency**

- Mean, Median, Mode, and Range
- Calculating and Interpreting
- Practice Problems

### **Lesson 12.3: Probability**

- Basic Probability Concepts
- Simple Experiments
- Practice Problems

### **Lesson 12.4: Probability and Combinations**

- Understanding Combinations
- Solving Probability Problems with Combinations
- Practice Problems

## **Chapter 13: Polynomials and Nonlinear Functions**

### **Lesson 13.1: Introduction to Polynomials**

- Definition and Classification
- Adding and Subtracting Polynomials
- Practice Problems

### **Lesson 13.2: Multiplying Polynomials**

- Monomial by Monomial
- Binomial by Binomial
- Practice Problems

### **Lesson 13.3: Factoring Polynomials**

- Factoring Techniques
- Solving Polynomial Equations
- Practice Problems

### **Lesson 13.4: Nonlinear Functions**

- Understanding Nonlinear Functions
- Graphing Quadratic Functions
- Practice Problems