

## Math 8 Course Syllabus

### Chapter 1: Number Sense – Integers & Basic Operations

- **Description:** Students build a foundation in number theory and integer operations. This chapter focuses on building confidence with positive and negative numbers using visual models and mastering the order of operations (BEDMAS).
- **Sections:**
  - 1.A: Preliminary Adding and Subtracting Integers
  - 1.1: Evaluating Expressions with Counting Chips
  - 1.2: Multiplying Integers with Area Models
  - 1.3: Strategies for Multiplying Integers
  - 1.4: Division with Counters
  - 1.5: Perfect Squares, Cubes, and Roots
  - 1.6: Order of Operations (BEDMAS)

### Chapter 2: Operations with Fractions

- **Description:** This chapter covers all four operations with fractions. Students learn to use manipulatives and area models to visualize multiplication and division, ensuring a deep understanding before moving to purely algebraic methods.
- **Sections:**
  - 2.A: Finding Factors and GCF
  - 2.B: Adding and Subtracting Fractions Review
  - 2.1: Introduction to Fractions and Multiplying Fractions
  - 2.2: Multiplying Fractions Using Area Models
  - 2.3: Multiplying Mixed Fractions
  - 2.4: Dividing Fractions and Integers with Manipulatives
  - 2.5: Dividing Two Fractions with Manipulatives
  - 2.6: Combined Operations with Fractions (BEDMAS)

### Chapter 3: Percentages

- **Description:** Students explore the relationship between fractions, decimals, and percentages. The focus is on real-world applications, such as calculating discounts, taxes, and multi-step percentage problems.
- **Sections:**
  - 3.1: What are Percentages?
  - 3.2: Converting Fractions to Decimals and Percentages
  - 3.3: Evaluating the Percentage of a Number
  - 3.4: Applications of Percentages

#### **Chapter 4: Rates and Ratios**

- **Description:** This chapter focuses on proportional reasoning. Students learn to compare quantities using ratios and rates, and apply cross-multiplication strategies to solve for unknown values in proportions.
- **Sections:**
  - 4.1: What are Ratios and Equivalent Ratios?
  - 4.2: Rates and Unit Rates
  - 4.3: Proportional Reasoning
  - 4.4: Cross-Multiplication Strategies

#### **Chapter 5: Reading Graphs and Interpreting Data**

- **Description:** Students learn to analyze and represent data. This includes understanding different types of graphs (bar, line, circle) and identifying how data can be misrepresented in the media.
- **Sections:**
  - 5.1: Interpreting Bar and Circle Graphs
  - 5.2: Understanding Mean, Median, and Mode
  - 5.3: Identifying Misleading Graphs

#### **Chapter 6: Probability**

- **Description:** This chapter introduces the concept of chance. Students calculate theoretical and experimental probability and use tree diagrams and tables to determine the outcomes of independent events.
- **Sections:**
  - 6.1: Theoretical vs. Experimental Probability
  - 6.2: Independent Events
  - 6.3: Sample Spaces and Tree Diagrams

### **Chapter 7: Pythagorean Properties**

- **Description:** Focused on the geometry of right triangles, students learn to estimate square roots and use the Pythagorean Theorem to find missing side lengths in various contexts.
- **Sections:**
  - 7.1: Squares and Square Roots
  - 7.2: What is the Pythagorean Theorem?
  - 7.3: Estimating Square Roots
  - 7.4: Proving and Using the Pythagorean Theorem
  - 7.5: Problem Solving with Right Triangles

### **Chapter 8: Surface Area of 3D Solids**

- **Description:** Students develop spatial reasoning skills by drawing 3D views of objects and constructing nets to calculate the surface area of rectangular prisms, triangular prisms, and cylinders.
- **Sections:**
  - 8.1: Drawing 3D Views of Solids
  - 8.2: Nets of 3D Solids
  - 8.3: Surface Areas of Prisms
  - 8.4: Surface Areas of Cylinders

### **Chapter 9: Volume of 3D Solids**

- **Description:** Building on the previous chapter, students learn to calculate the space inside 3D objects. This includes applying formulas for the volume of various prisms and cylinders.
- **Sections:**
  - 9.1: Volume of Right Prisms
  - 9.2: Volume of Cylinders
  - 9.3: Solving Problems with Volume

### **Chapter 10: Linear Relations**

- **Description:** Students explore patterns and relationships. They learn to represent these relationships using tables of values, graphs, and linear equations, focusing on discrete linear patterns.
- **Sections:**
  - 10.1: Introduction to Linear Relations
  - 10.2: Finding Patterns in a Table of Values
  - 10.3: Graphing Linear Relationships

### **Chapter 11: Solving Linear Equations**

- **Description:** The final chapter introduces formal algebra. Students learn to solve two-step linear equations using concrete models (like algebra tiles) and algebraic balance methods.
- **Sections:**
  - 11.1: Modeling Two-Step Equations
  - 11.2: Solving Equations Algebraically
  - 11.3: Verifying Solutions (Checking Your Work)