



Math 6

Semester A Summary:

In this course, students will learn, practice, and apply the fundamental skills and strategies that will help them grow into strong mathematical thinkers. Daily instruction supports student learning of core math concepts and development of procedural fluency regarding the ordering of numbers, integers, whole numbers and decimals, ratios and percents, rates and measurement, the coordinate plane, number theory and fractions, and the addition and subtraction of fractions. Students are encouraged to use visual representations of their thinking to bridge their understanding between the concrete and abstract, allowing patterns and mathematical principles to come to life. Peer Model videos throughout provide illustrations of a peer learning how to use and apply the target mathematical skill using a real-world example. 21st Century instruction further illustrates the connection of mathematical concepts to the real world while supporting students' development of skills, knowledge, and expertise they must master to succeed in life and work. Mathematical discussion prompts encourage students to revise misunderstanding, uncover nuances in application, make connections to prior knowledge, identify patterns, and engage with vocabulary. Students are encouraged to listen critically, critique the reasoning of others, and justify their own solutions. The courses are designed to support a growth mindset regarding math and encourage students to engage in productive struggle; instructional materials explicitly and frequently remind students that mistakes are opportunities for learning and acquiring new skills. Together the course elements ensure the student grows as a mathematical thinker and masters the skills to succeed in life and work.

Semester A Outline

1. Math 6 A Course Overview

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2. Ordering Numbers

1. Opposite Numbers

- In this section, you will use positive and negative numbers to describe quantities as having opposite directions or values.
- In this section, you will use positive and negative numbers, and zero, to represent amounts in real-world examples.

2. Model with Opposite Numbers Prompt

3. Model with Opposite Numbers Discussion

4. Opposites on a Number Line

- In this section, you will recognize opposite numbers.
- In this section, you will recognize that the opposite of the opposite of a number is the number itself.

5. Statements of Order

- In this section, you will interpret inequalities to determine the relative position of two numbers on a number line.
- In this section, you will write and interpret statements of order for rational numbers in real-world contexts.

6. Absolute Value

- In this section, you will describe the absolute value of a rational number as its distance from zero on the number line.
- In this section, you will use signed numbers to represent real-life situations and interpret absolute value as a magnitude of a positive or negative quantity.
- In this section, you will distinguish comparisons of absolute value from statements about order.

7. Ordering Numbers Apply

8. Ordering Numbers Review

9. Ordering Numbers Unit Test

3. Integers

1. Integers Introduction

2. The Set of Integers

- In this section, you will classify numbers with representation in categories of whole numbers, integers, and rational numbers.
- In this section, you will identify the relationship of numbers as whole number, integers, or rational numbers.

3. Integer Addition

- In this section, you will illustrate addition of integers using models.
- In this section, you will relate concrete models of integer addition to standardized algorithms.
- In this section, you will demonstrate addition of integers.

4. Integer Subtraction

- In this section, you will model subtracting integers.
- In this section, you will relate concrete models of integer subtraction to standardized algorithms.
- In this section, you will demonstrate subtraction of integers.

5. Integer Multiplication

- In this section, you will illustrate multiplication of integers using models.
- In this section, you will relate models of integer multiplication to algorithms.
- In this section, you will demonstrate multiplication of integers.

6. Integer Division

- In this section, you will illustrate division of integers using models.
- In this section, you will relate models of integer division to algorithms.
- In this section, you will demonstrate division of integers.

7. Problem Solving with Integers

- In this section, you will solve practical problems with integer operations.
- In this section, you will simplify numerical expressions involving integers.

8. Integers Apply

9. Integers Review

10. Integers Unit Test

4. Whole Numbers and Decimals

1. Whole Numbers and Decimals Introduction

2. Add Whole Numbers and Decimals

- In this section, you will add multi-digit whole numbers using the standard algorithm.
- In this section, you will add multi-digit decimals using the standard algorithm.

3. Subtract Whole Numbers and Decimals

- In this section, you will subtract multi-digit whole numbers, using the

- standard algorithm.
 - In this section, you will subtract decimals, using this skill to solve real-world problems.
 - In this section, you will solve real-world problems using addition and subtraction with decimals.
4. Multiply Whole Numbers and Decimals
 - In this section, you will multiply multi-digit whole numbers using the standard algorithm.
 - In this section, you will multiply decimal numbers using the standard algorithm.
 - In this section, you will solve multi-step real-world problems by multiplying with decimals.
 5. Divide Whole Numbers and Decimals
 - In this section, you will divide multi-digit whole numbers using the standard algorithm.
 - In this section, you will divide multi-digit decimal numbers using the standard algorithm.
 - In this section, you will solve real-world problems using division with decimals.
 6. Divide Whole Numbers and Decimals Portfolio
 7. Whole Numbers and Decimals Apply
 8. Whole Numbers and Decimals Review
 9. Whole Numbers and Decimals Unit Test
- 5. Ratios and Percents**
1. Ratios and Percents Introduction
 2. Representing Ratios
 - In this section, you will express a ratio in three ways.
 - In this section, you will use ratio language to describe a ratio relationship between two quantities.
 3. Tape Diagrams
 - In this section, you will use tape diagrams to solve real-world problems.
 4. Ratio Tables
 - In this section, you will create tables of equivalent ratios relating quantities with whole-number measurements.
 - In this section, you will look for and express regularity in repeated reasoning to find missing values in tables of equivalent ratios.
 - In this section, you will use tables to compare ratios.
 5. Convert Percent to Rate
 - In this section, you will find a percentage of a quantity as a rate per 100.
 6. Ratios and Percents Apply
 7. Ratios and Percents Review
 8. Ratios and Percents Unit Test
- 6. Rates and Measurement**
1. Rates and Measurement Introduction
 2. Proportional Relationships
 - In this section, you will use ratios to describe proportional relationships.
 - In this section, you will describe unit rates in terms of ratios.
 - In this section, you will determine whether a proportional relationship exists between two quantities.
 3. Find Unit Rates
 - In this section, you will convert a given ratio into a unit rate.

4. Constant Speed
 - In this section, you will solve unit rate problems involving constant speed.
 - In this section, you will solve unit rate problems involving unit pricing.
 - In this section, you will solve unit rate problems that apply to situations you may encounter in real life.
5. Measurement Units
 - In this section, you will organize measurement units by size and type.
 - In this section, you will convert units by multiplying or dividing quantities.
 - In this section, you will convert units of measurement using ratio reasoning.
6. Rates and Measurement Apply
7. Rates and Measurement Review
8. Rates and Measurement Unit Test

7. **The Coordinate Plane**

1. The Coordinate Plane Introduction
2. The Coordinate Plane
 - In this section, you will plot integers and other rational numbers on horizontal and vertical number lines.
 - In this section, you will identify all of the parts of a coordinate plane (axes, tick marks, quadrants, points, etc.).
3. Identifying Quadrants
 - In this section, you will describe signs of numbers in ordered pairs and their relationships to locations in quadrants on a coordinate plane.
4. Reflections of Points
 - In this section, you will recognize that when the coordinates of two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
5. Plotting Ordered Pairs
 - In this section, you will plot pairs of integers and other rational numbers (ordered pairs) in all four quadrants of a coordinate plane.
6. Coordinate Plane Problems
 - In this section, you will solve mathematical and real-world problems by graphing points in all four quadrants of the coordinate plane.
 - In this section, you will solve mathematical and real-world problems using coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
7. Coordinate Plane Problems Portfolio
8. Ratios in the Coordinate Plane
 - In this section, you will plot ratios with whole-number measurements on the coordinate plane.
 - In this section, you will connect representations of proportional relationships.
 - In this section, you will solve real-world and mathematical problems by plotting ratios on a coordinate plane.
9. The Coordinate Plane Apply
10. The Coordinate Plane Review
11. The Coordinate Plane Unit Test

8. **Number Theory and Fractions**

1. Number Theory and Fractions Introduction
2. Prime and Composite Numbers
 - In this section, you will determine if one number is divisible by another number.
 - In this section, you will classify numbers as prime or composite.

3. Prime and Composite Numbers Prompt
4. Prime and Composite Numbers Discussion
5. Factors of Composite Numbers
 - In this section, you will identify the whole number factors of a composite number.
6. Prime Factorization
 - In this section, you will express a whole number as a product of its prime factors using exponents.
7. Greatest Common Factor
 - In this section, you will determine the greatest common factor of two whole numbers.
8. The Distributive Property
 - In this section, you will use the Distributive Property to express a sum of two whole numbers that share a common factor.
9. Equivalent Fractions and Mixed Numbers
 - In this section, you will identify fractions that are equivalent to a given fraction.
 - In this section, you will convert improper fractions to mixed numbers and vice versa.
10. Fraction, Decimal, and Percent Equivalents
 - In this section, you will recognize and express commonly used fractions (halves, thirds, fourths, fifths, eighths, tenths) in decimal form and solve problems involving them.
 - In this section, you will recognize and express commonly used fractions (halves, thirds, fourths, fifths, eighths, tenths) in percent form and solve problems involving them.
 - In this section, you will determine equivalencies among fractions, mixed numbers, decimals, and percents.
11. Ordering Fractions and Decimals
 - In this section, you will identify the numerical order of a given set of fractions and mixed numbers.
 - In this section, you will identify the numerical order of a given set of fractions and decimals.
12. Number Theory and Fractions Apply
13. Number Theory and Fractions Review
14. Number Theory and Fractions Unit Test

9. **Add and Subtract Fractions**

1. Add and Subtract Fractions Introduction
2. Add with Like Denominators
 - In this section, you will add fractions with like denominators.
3. Least Common Multiple
 - In this section, you will determine the least common multiple of two whole numbers.
4. Add with Unlike Denominators
 - In this section, you will add fractions of different values.
5. Subtract Fractions
 - In this section, you will subtract fractions with like denominators.
 - In this section, you will subtract fractions with unlike denominators.
6. Add and Subtract Fractions to Solve Problems
 - In this section, you will solve real-world problems by adding and subtracting fractions with like and unlike denominators.

7. Add and Subtract Mixed Numbers
 - In this section, you will add and subtract mixed numbers in which the denominators are the same.
 - In this section, you will add and subtract mixed numbers in which the denominators are not the same.
8. Solve Problems with Mixed Numbers
 - In this section, you will solve word problems involving addition and subtraction with mixed numbers in a real-world context.
 - In this section, you will solve real-world problems involving fractions.
 - In this section, you will solve multi-step real-world problems involving addition and subtraction with positive fractions, including mixed numbers.
9. Add and Subtract Fractions Apply
10. Add and Subtract Fractions Review
11. Add and Subtract Fractions Unit Test

Semester B Summary:

In this course, the student will learn, practice, and apply the fundamental skills and strategies that will help them grow into strong mathematical thinkers. Daily instruction supports student learning of core math concepts and development of procedural fluency regarding multiplying and dividing fractions; expressions and equations; inequalities; area and volume; coordinate geometry and nets; and statistics. Students are encouraged to use visual representations of their thinking to bridge their understanding between the concrete and abstract, allowing patterns and mathematical principles to come to life. Peer Model videos throughout provide illustrations of a peer learning how to use and apply the target mathematical skill using a real-world example. 21st Century instruction further illustrates the connection of mathematical concepts to the real world while supporting students' development of skills, knowledge, and expertise they must master to succeed in work and life. Mathematical discussion prompts encourage students to revise misunderstanding, uncover nuances in application, make connections to prior knowledge, identify patterns, and engage with vocabulary. Students are encouraged to listen critically, critique the reasoning of others, and justify their own solutions. The course is designed to support a growth mindset regarding math and encourages students to engage in productive struggle; instructional materials explicitly and frequently remind students that mistakes are opportunities for learning and acquiring new skills. Together the course elements ensure the student grows as a mathematical thinker and masters the skills to succeed in work and life.

Semester B Outline

1. **Math 6 B Course Overview**
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2. **Multiply and Divide Fractions**
 1. Multiply Whole Numbers and Fractions
 - In this section, you will multiply a whole number and a fraction to find the product.
 2. Multiply Two Fractions
 - In this section, you will multiply two fractions.
 3. Multiply Fractions and Mixed Numbers
 - In this section, you will multiply fractions and mixed numbers.
 4. Multiply Fractions to Solve Problems
 - In this section, you will solve real-world problems involving health literacy by

- multiplying fractions.
 - In this section, you will solve real-world problems by multiplying fractions and mixed numbers.
 - In this section, you will solve multi-step real-world problems involving multiplication with positive fractions, including mixed numbers.
5. Multiply Fractions to Solve Problems Discussion
 6. Multiply Fractions to Solve Problems Discussion
 7. Quotients of Fractions
 - In this section, you will compute the quotient in problems with fractions.
 - In this section, you will interpret the quotient after dividing fractions.
 8. Divide Fractions
 - In this section, you will determine the quotient of a fraction and a whole number.
 - In this section, you will divide fractions and mixed numbers.
 9. Divide Fractions to Solve Problems
 - In this section, you will solve word problems that involve dividing fractions by fractions.
 - In this section, you will solve real-world problems by dividing fractions and mixed numbers.
 - In this section, you will solve multi-step real-world problems involving division with positive fractions, including mixed numbers.
 10. Multiply and Divide Fractions Apply
 11. Multiply and Divide Fractions Review
 12. Multiply and Divide Fractions Unit Test
- 3. Expressions**
1. Expressions Introduction
 2. Numerical Expressions
 - In this section, you will write numerical expressions involving whole-number exponents.
 - In this section, you will evaluate numerical expressions involving whole-number exponents.
 - In this section, you will represent patterns with whole number exponents and perfect squares.
 3. Variable Expressions
 - In this section, you will use a variable to represent an unknown number that would lead to solving a problem.
 - In this section, you will write an expression to represent a real-world problem using variables to represent numbers.
 4. Evaluate Expressions
 - In this section, you will evaluate expressions at specific values of their variables.
 - In this section, you will evaluate expressions that arise from formulas used in real-world problems when variables are at specific values.
 5. Translate Expressions
 - In this section, you will translate words into algebraic expressions.
 - In this section, you will translate algebraic expressions into words.
 6. Parts of an Expression
 - In this section, you will identify different parts of an expression using mathematical vocabulary.
 - In this section, you will use mathematical vocabulary to describe different parts of equations and expressions.

7. Use the Order of Operations
 - In this section, you will use the order of operations to simplify numerical expressions.
8. Properties of Operations
 - In this section, you will identify the Associative and Commutative Properties of Addition and the Associative, Commutative, and Distributive Properties of Multiplication in various expressions.
9. Equivalent Expressions
 - In this section, you will use the properties of operations to identify when two expressions are equivalent.
 - In this section, you will apply the properties of operations to a given expression to generate an equivalent expression.
10. Expressions Apply
11. Expressions Review
12. Expressions Unit Test

4. Equations

1. Equations Introduction
2. True Equations
 - In this section, you will describe how to solve an equation by finding the value(s) that make the equation true.
 - In this section, you will use substitution to determine whether a given number in a set makes an equation true.
3. Solve Equations By Adding or Subtracting
 - In this section, you will solve one-step equations involving addition.
 - In this section, you will solve one-step equations involving subtraction.
 - In this section, you will write and solve one-step equations for real-world problems.
4. Solve Equations By Dividing
 - In this section, you will solve one step equations by using division.
 - In this section, you will solve for the whole when a percent and a part is given.
 - In this section, you will solve word problems using one-step equations with multiplication.
5. Solve Equations By Multiplying
 - In this section, you will solve for x (a variable) in a fraction equation $\frac{x}{p} = q$.
 - In this section, you will solve for x (a variable) in a real-world equation where $\frac{x}{p} = q$.
6. Types of Variables in Equations
 - In this section, you will identify the dependent and independent variables in a word problem.
7. Write Equations
 - In this section, you will create equations between two variables using real-world problems.
8. Compare Representations
 - In this section, you will analyze the relationship between the dependent variables and the independent variables shown in tables and graphs representing real-world situations.
 - In this section, you will describe how tables, graphs, and equations can all be used to represent real-world relationships in different ways.
9. Compare Representations Portfolio
10. Equations Apply

11. Equations Review
12. Equations Unit Test

5. Inequalities

1. Inequalities Introduction
2. Solve Inequalities
 - In this section, you will determine whether an inequality is true for a given value of x .
 - In this section, you will solve inequalities by finding values that make the inequality true.
3. Solutions of Inequalities
 - In this section, you will use a number line to show the solutions of an inequality.
 - In this section, you will see how an inequality has an infinite number of solutions.
4. Write Inequalities to Solve Problems
 - In this section, you will write inequalities to represent limits in real-world situations.
5. Solve Inequalities By Adding or Subtracting
 - In this section, you will solve inequalities that involve addition and subtraction.
 - In this section, you will solve real-world problems by writing inequalities involving addition or subtraction.
6. Solve Inequalities By Multiplying or Dividing
 - In this section, you will solve one-step inequalities involving multiplication or division.
 - In this section, you will solve real-world problems with inequalities involving multiplication or division.
7. Inequalities Apply
8. Inequalities Review
9. Inequalities Unit Test

6. Perimeter and Area

1. Perimeter and Area Introduction
2. Perimeter of Rectangles and Triangles
 - In this section, you will calculate the perimeter of triangles and rectangles.
 - In this section, you will solve problems involving perimeter of triangles and rectangles.
3. Area of Rectangles and Right Triangles
 - In this section, you will determine the area of a rectangle.
 - In this section, you will determine the area of right triangles by composing them into rectangles.
4. Area of Non-right Triangles
 - In this section, you will determine the area of non-right triangles by composing into rectangles or decomposing into triangles and other shapes.
5. Use Area to Solve Problems
 - In this section, you will compose figures into rectangles to solve real-world problems.
 - In this section, you will decompose figures into different shapes to solve real-world problems.
6. Use Area to Solve Problems Portfolio
7. Approximating Pi
 - In this section, you will approximate the value of π using circular figures.

- In this section, you will be able to express pi as the ratio of the distance around any circle to the distance across, as both a fractional approximation ($\frac{22}{7}$) and as a decimal approximation (3.14).
8. Circumference
 - In this section, you will find the circumference of a circle.
 - In this section, you will solve problems involving circumference of a circle.
 9. Area of a Circle
 - In this section, you will calculate the area of a circle.
 - In this section, you will solve problems involving the area of a circle.
 10. Perimeter and Area Apply
 11. Perimeter and Area Review
 12. Perimeter and Area Unit Test
- 7. Coordinate Geometry and Nets**
1. Coordinate Geometry and Nets Introduction
 2. Polygons in the Coordinate Plane
 - In this section, you will draw polygons in all four quadrants of the coordinate plane given coordinates for the vertices.
 - In this section, you will use coordinates to find the length of a side joining points with the same first coordinate.
 - In this section, you will use coordinates to find the length of a side in which joining points have the same first coordinate. You will apply this skill to real-world problems.
 3. Use Coordinate Geometry to Solve Problems
 - In this section, you will use coordinates to find the length of a side joining points with the same second coordinate.
 - In this section, for polygons in the coordinate plane, you will apply the technique of using coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate in the context of solving mathematical problems.
 - In this section, you will use coordinates to determine the congruence of segments, angles, and polygons in the coordinate plane.
 4. Nets with Rectangles and Triangles
 - In this section, you will represent three-dimensional figures using nets made up of rectangles.
 - In this section, you will model three-dimensional figures with nets of rectangles and triangles.
 5. Surface Area of Rectangular Prisms
 - In this section, you will use nets to find the surface area of rectangular prisms.
 6. Use Nets to Solve Rectangular Problems
 - In this section, you will find the surface area of rectangular prisms by using their nets.
 - In this section, you will find the surface area of real rectangular prisms by using their nets.
 7. Use Nets to Solve Rectangular Problems Discussion
 8. Use Nets to Solve Rectangular Problems Discussion
 9. Surface Area of Triangular Prisms
 - In this section, you will use nets to find the surface area of triangular prisms.
 10. Use Nets to Solve Triangular Problems
 - In this section, you will apply the technique of using nets to find the surface area of triangular prisms in the context of solving mathematical problems.

- In this section, you will use nets to find the surface area of triangular prisms.
11. Coordinate Geometry and Nets Apply
 12. Coordinate Geometry and Nets Review
 13. Coordinate Geometry and Nets Unit Test

8. **Statistics**

1. Statistical Questions
 - In this section, you will determine whether a question is a statistical question.
 - In this section, you will identify important information about numerical datasets.
2. Represent Categorical Data
 - In this section, you will display categorical data using a circle graph.
 - In this section, you will interpret a set of data represented in a circle graph.
 - In this section, you will compare circle graphs with bar graphs, pictographs, and line plots of the same data.
3. Represent Numerical Data
 - In this section, you will record the number of observations in a dataset by using a table, tally chart, dot plot, or histogram.
 - In this section, you will use a dot plot to display numerical information.
 - In this section, you will use histograms to display numerical information.
4. Describe Data Sets
 - In this section, you will identify gaps and outliers in datasets.
 - In this section, you will use graphs to describe datasets according to their center, their spread, and their overall shape.
5. Measures of Center
 - In this section, you will determine the mean and median of a data set.
 - In this section, you will recognize that a measure of center for a numerical data set summarizes all of its values with a single number.
 - In this section, you will determine and describe how the mean and the median are impacted by changes in data values.
6. Center and Shape
 - In this section, you will represent the mean of a dataset graphically as the balance point.
 - In this section, you will determine whether the mean or median best describes the shape of a data set.
7. Measures of Variation
 - In this section, you will determine the quartiles and extremes of a dataset.
 - In this section, you will determine the range and the interquartile range of a data set.
8. Box Plots
 - In this section, you will create a box plot to display numerical data.
9. Mean Absolute Deviation
 - In this section, you will calculate the mean absolute deviation of a dataset.
10. Compare Measures of Variation
 - In this section, you will recognize that a measure of variation for a numerical dataset describes how its values vary with a single number.
 - In this section, you will determine whether the range or interquartile range best describes the spread of a dataset.
 - In this section, you will determine whether the interquartile range or the mean absolute deviation best describes the shape of a dataset.
11. Analyze Data Shape and Context

- In this section, you will summarize numerical datasets in relation to their context by relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
12. Statistics Apply
 13. Statistics Review
 14. Statistics Unit Test