Carnegie Learning Course 1 Alignment to Connecticut Mathematics Model Curricula

Middle School Math Solution Course 1			
Model Unit Name	**Model Unit Standards**	**Lessons**	**Pacing** *Lessons that address concepts in more than one unit are only counted once.*
Operating with Positive Rational Numbers	**6.NS.A.1**	**MATHbook** **Module 1: Composing and Decomposing** **Topic 1: Factors and Multiples** Lesson 5: Yours IS the Reason Why!: Fraction by Fraction Division **MATHia** **Unit 4: Fraction by Fraction Division** ● Representing Fraction Division ● Interpreting Remainders Using Models ● Developing the Fraction Division Algorithm ● Multiplying and Dividing Rational Numbers	17 days
	6.NS.A.2	**MATHbook** **Module 1: Composing and Decomposing** **Topic 3: Decimals** Lesson 4: Dividend in the House: Dividing Whole Numbers and Decimals **MATHia** **Unit 11: Dividing Decimals** ● Dividing Decimals ● Whole Number and Decimal Quotients	

<table>
<tr>
<td rowspan="2">Operating with Positive Rational Numbers
(Continued)</td>
<td>6.NS.B.3</td>
<td>MATHbook
Module 1: Composing and Decomposing
Topic 3: Decimals
Lesson 2: Get in Line: Adding and Subtracting Decimals
Lesson 3: Product Placement: Multiplying Decimals
Lesson 4: Dividend in the House: Dividing Whole Numbers and Decimals
MATHia
Unit 9: Adding and Subtracting Decimals
• Adding and Subtracting Decimals
• Decimal Sums and Differences
Unit 10: Multiplying Decimals
• Exploring Decimal Facts
• Patterns with Products and Quotients
• Multiplying Decimals
• Decimal Products
Unit 11: Dividing Decimals
• Dividing Decimals
• Whole Number and Decimal Quotients
• Solving Real-World Problems Using Decimal Operations</td>
<td rowspan="2"></td>
</tr>
<tr>
<td>6.NS.B.4</td>
<td>MATHbook
Module 1: Composing and Decomposing
Topic 1: Factors and Multiples
Lesson 2: Searching for Common Ground: Common Factors and Common Multiples
Lesson 3: Composing and Decomposing Numbers: Least Common Multiple and Greatest Common Factor
MATHia
Unit 2: Identifying Common Factors and Common Multiples
• Prime Factorization
• Determining the LCM or GCF of Two Numbers
• Using the GCF to Rewrite the Sum of Two Numbers</td>
</tr>
</table>

Operating with Positive Rational Numbers ***(Continued)***	**6.G.A.2**	**MATHbook** **Module 1: Composing and Decomposing** **Topic 2: Area, Volume, and Surface Area** Lesson 3: Length, Width, and Depth: Deepening Understanding of Volume **Topic 3: Decimals** Lesson 3: Product Placement: Multiplying Decimals Lesson 4: Dividend in the House: Dividing Whole Numbers and Decimals **MATHia** **Unit 7: Deepening Understanding of Volume** ● Determining Volume Using Unit Fraction Cubes ● Calculating Volume of Right Rectangular Prisms	
Understanding Positive and Negative Numbers	**6.NS.C.5**	**MATHbook** **Module 4: Moving Beyond Positive Quantities** **Topic 1: Signed Numbers** Lesson 1: Human Number Line: Introduction to Negative Numbers **MATHia** **Unit 1: Introduction to Negative Numbers** ● Introduction to Negative Numbers	12 days
	6.NS.C.6	**MATHbook** **Module 4: Moving Beyond Positive Quantities** **Topic 1: Signed Numbers** Lesson 1: Human Number Line: Introduction to Negative Numbers Lesson 3: What's in a Name?: Rational Number System **Topic 2: The Four Quadrants** Lesson 1: Four Is Better Than One: Extending the Coordinate Plane **MATHia** **Unit 1: Introduction to Negative Numbers** ● Introduction to Negative Numbers ● Representing Integers on Number Lines **Unit 3: Rational Number System** ● Classifying Rational Numbers **Unit 4: Extending the Coordinate Plane** ● Exploring Symmetry on the Coordinate Plane ● Identifying and Interpreting Ordered Pairs ● Plotting Points	

Understanding Positive and Negative Numbers *(Continued)*	**6.NS.C.7**	**MATHbook** **Module 4: Moving Beyond Positive Quantities** **Topic 1: Signed Numbers** Lesson 1: Human Number Line: Introduction to Negative Numbers Lesson 2: Magnificent Magnitude: Absolute Value **MATHia** **Unit 1: Introduction to Negative Numbers** ● Representing Integers on Number Lines **Unit 2: Absolute Value** ● Using Absolute Value	
	6.NS.C.8	**MATHbook** **Module 4: Moving Beyond Positive Quantities** **Topic 2: The Four Quadrants** Lesson 1: Four Is Better Than One: Extending the Coordinate Plane Lesson 2: Playing with Planes: Graphing Geometric Figures Lesson 3: There are Many Paths . . .: Problem Solving on the Coordinate Plane **MATHia** **Unit 5: Graphing Geometric Figures** ● Drawing Polygons on the Coordinate Plane	

<table>
<tr>
<td rowspan="2">Using Expressions and Equations</td>
<td>6.EE.A.1</td>
<td>MATHbook
Module 1: Composing and Decomposing
Topic 1: Factors and Multiples
Lesson 2: Searching for Common Ground: Common Factors and Common Multiples
Module 3: Determining Unknown Quantities
Topic 1: Expressions
Lesson 1: Relationships Matter: Evaluating Numeric Expressions
MATHia
Unit 1: Evaluating Numeric Expressions
● Writing and Evaluating Exponential Expressions
● Order of Operations
● Applying the Order of Operations
● Using Order of Operations to Evaluate Simple Numeric Expressions
● Using Order of Operations to Evaluate Numeric Expressions with Four Operations
● Using Order of Operations to Evaluate Numeric Expressions with Parentheses and Exponents
● Using Order of Operations to Evaluate Numeric Expressions</td>
<td rowspan="2">21 days</td>
</tr>
<tr>
<td>6.EE.A.2</td>
<td>MATHbook
Module 1: Composing and Decomposing
Topic 1: Factors and Multiples
Lesson 1: Taking Apart Numbers and Shapes: Writing Equivalent Expressions Using the Distributive Property
Module 3: Determining Unknown Quantities
Topic 1: Expressions
Lesson 2: Into the Unknown: Introduction to Algebraic Expressions
MATHia
Unit 2: Introduction to Algebraic Expressions
● Writing Expressions from Verbal Descriptions
● Identifying Parts of Simple Algebraic Expressions
● Evaluating One-Step Expressions with Whole Numbers
● Evaluating Two-Step Expressions with Whole Numbers
● Evaluating Multi-Step Expressions
● Evaluating Expressions with Multiple Variables</td>
</tr>
</table>

Using Expressions and Equations ***(Continued)***	**6.EE.A.3**	**MATHbook** **Module 1: Composing and Decomposing** **Topic 1: Factors and Multiples** Lesson 1: Taking Apart Numbers and Shapes: Writing Equivalent Expressions Using the Distributive Property **MATHia** **Unit 1: Number Properties** ● Commutative and Associative Properties ● Exploring the Distributive Property with Numeric Expressions ● Using the Distributive Property with Numeric Expressions **MATHbook** **Module 3: Determining Unknown Quantities** **Topic 1: Expressions** Lesson 3: Second Verse, Same as the First: Equivalent Expressions **MATHia** **Unit 3: Equivalent Algebraic Expressions** ● Modeling Equivalent Algebraic Expressions ● Exploring the Distributive Property with Algebraic Expressions ● Using Order of Operations to Rewrite Simple Algebraic Expressions ● Using Order of Operations to Rewrite Algebraic Expressions with Four Operations ● Using Order of Operations to Rewrite Algebraic Expressions with Parentheses and Exponents ● Using Order of Operations to Rewrite Algebraic Expressions	
	6.EE.A.4	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 1: Expressions** Lesson 4: Are They Saying the Same Thing?: Verifying Equivalent Expressions **MATHia** **Unit 3: Equivalent Algebraic Expressions** ● Modeling Equivalent Algebraic Expressions	

Using Expressions and Equations ***(Continued)***	**6.EE.B.5**	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 2: Equations** Lesson 4: One, None, or a Ton: Solutions to Equations and Inequalities **MATHia** **Unit 5: Reasoning with Algebraic Expressions** ● Using Substitution to Identify Solutions to Equations **Unit 9: Solutions to Inequalities** ● Using Substitution to Identify Solutions to Inequalities	
	6.EE.B.6	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 1: Expressions** Lesson 3: Second Verse, Same as the First: Equivalent Expressions **Topic 2: Equations** Lesson 1: First Among Equals: Reasoning with Equal Expressions Lesson 2: Double Talk: Solving One-Step Addition Equations Lesson 3: Play It In Reverse: Solving One-Step Multiplication Equations Lesson 5: Getting Real: Solving Equations to Solve Problems **MATHia** **Unit 2: Introduction to Algebraic Expressions** ● Patterns and One-Step Expressions **Unit 12: Multiple Representations of Equations** ● Patterns and One-Step Equations ● Problem Solving Using Multiple Representations in the First Quadrant ● Problem Solving with Decimals	

Using Expressions and Equations ***(Continued)***	**6.EE.B.7**	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 2: Equations** Lesson 2: Double Talk: Solving One-Step Addition Equations Lesson 3: Play It In Reverse: Solving One-Step Multiplication Equations Lesson 5: Getting Real: Solving Equations to Solve Problems **MATHia** **Unit 4: Using Algebraic Expressions to Analyze and Solve Problems** ● Using Picture Algebra with Addition, Subtraction and Multiplication ● Using Picture Algebra with Multiplication, Total Given ● Using Picture Algebra with Addition and Subtraction, Total Given **Unit 6: Solving One-Step Addition and Subtraction Equations** ● Exploring One-Step Equations with Double Number Lines ● Using Double Number Lines to Solve One-Step Addition Equations ● Solving with Addition and Subtraction **Unit 7: Solving One-Step Multiplication and Division Equations** ● Using Double Number Lines to Solve One-Step Multiplication Equations ● Solving with Multiplication and Division ● Solving One-Step Equations **Unit 8: Solving One-Step Equations with Decimals and Fractions** ● Solving One-Step Equations with Decimals ● Solving One-Step Equations with Fractions **Unit 11: Using Graphs to Solve Problems** ● Graphs of Additive and Multiplicative Relationships ● Comparing Additive and Multiplicative Relationships **Unit 12: Multiple Representations of Equations** ● Patterns and One-Step Equations ● Problem Solving Using Multiple Representations in the First Quadrant ● Problem Solving with Decimals	

Using Expressions and Equations ***(Continued)***	**6.EE.B.8**	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 2: Equations** Lesson 4: One, None, or a Ton: Solutions to Equations and Inequalities **MATHia** **Unit 1: Introduction to Negative Numbers** ● Graphing Inequalities with Rational Numbers **Unit 9: Solutions to Inequalities** ● Graphing Inequalities with Positive Rational Numbers ● Writing Inequalities from Real-World Situations	
Applications of Geometry	**6.G.A.1**	**MATHbook** **Module 1: Composing and Decomposing** **Topic 2: Area, Volume, and Surface Area** Lesson 1: All About That Base . . . and Height: Area of Triangles and Quadrilaterals Lesson 2: Slicing and Dicing: Composite Figures Lesson 3: Length, Width, and Depth: Deepening Understanding of Volume **Topic 3: Decimals** Lesson 3: Product Placement: Multiplying Decimals Lesson 4: Dividend in the House: Dividing Whole Numbers and Decimals **MATHia** **Unit 5: Area of Triangles and Quadrilaterals** ● Calculating Area of Rectangles ● Developing Area Formulas ● Calculating Area of Various Figures **Unit 6: Composite Figures** ● Solving Area Problems ● Calculating Area of Composite Figures	16 days
	6.G.A.3	**MATHbook** **Module 4: Moving Beyond Positive Quantities** **Topic 2: The Four Quadrants** Lesson 2: Playing with Planes: Graphing Geometric Figures **MATHia** **Unit 5: Graphing Geometric Figures** ● Drawing Polygons on the Coordinate Plane	

Applications of Geometry ***(Continued)***	**6.G.A.4**	**MATHbook** **Module 1: Composing and Decomposing** **Topic 2: Area, Volume, and Surface Area** Lesson 4: Breaking the Fourth Wall: Surface Area of Rectangular Prisms and Pyramids **MATHia** **Unit 8: Surface Area of Rectangular Prisms and Pyramids** ● Determining Surface Area Using Nets ● Calculating Surface Area of Prisms and Pyramids Using Nets **Unit 11: Dividing Decimals** ● Solving Real-World Problems Using Decimal Operations	
Ratios and Rates	**6.RP.A.1**	**MATHbook** **Module 2: Relating Quantities** **Topic 1: Ratios** Lesson 1: It's All Relative: Introduction to Ratios Lesson 2: Going Strong: Comparing Ratios to Solve Problems Lesson 3: Different but the Same: Determining Equivalent Ratios Lesson 4: A Trip to the Moon: Using Tables to Represent Equivalent Ratios Lesson 5: They're Growing!: Graphs of Ratios Lesson 6: One Is Not Enough: Using and Comparing Ratio Representations **MATHia** **Unit 1: Introduction to Ratios** ● Differentiating Additive and Multiplicative Relationships ● Understanding Ratio Relationships	36 days
	6.RP.A.2	**MATHbook** **Module 2: Relating Quantities** **Topic 3: Unit Rates and Conversions** Lesson 2: What Is the Best Buy?: Introduction to Unit Rates **MATHia** **Unit 9: Introduction to Unit Rates** ● Understanding Unit Rates	

Ratios and Rates ***(Continued)***	**6.RP.A.3**	**MATHbook** **Module 2: Relating Quantities** **Topic 1: Ratios** Lesson 2: Going Strong: Comparing Ratios to Solve Problems Lesson 3: Different but the Same: Determining Equivalent Ratios Lesson 4: A Trip to the Moon: Using Tables to Represent Equivalent Ratios Lesson 5: They're Growing!: Graphs of Ratios Lesson 6: One Is Not Enough: Using and Comparing Ratio Representations **Topic 2: Percents** Lesson 1: We Are Family!: Percent, Fraction, and Decimal Equivalence Lesson 2: Warming the Bench: Using Estimation and Benchmark Percents Lesson 3: The Forest for the Trees: Determining the Part and the Whole in Percent Problems **Topic 3: Unit Rates and Conversions** Lesson 1: Many Ways to Measure: Using Ratio Reasoning to Convert Units Lesson 2: What Is the Best Buy?: Introduction to Unit Rates Lesson 3: Seeing Things Differently: Multiple Representations of Unit Rates **MATHia** **Unit 2: Determining Equivalent Ratios** ● Introduction to Double Number Lines ● Using Double Number Lines to Determine Equivalent Ratios ● Problem Solving with Equivalent Ratios and Rates Using Double Number Lines **Unit 3: Using Tables to Represent Equivalent Ratios** ● Introduction to Ratio Tables ● Using Tables to Determine Equivalent Ratios ● Problem Solving with Equivalent Ratios and Rates Using Tables **Unit 4: Graphs of Ratios** ● Using Graphs to Determine Equivalent Ratios ● Problem Solving with Equivalent Ratios and Rates using Graphs **Unit 5: Using and Comparing Ratio Representations** ● Multiple Representations of Ratios **Unit 6: Percent, Fraction, and Decimal Equivalence** ● Percent Models ● Fraction, Decimal, Percent Conversions	

		Unit 7: Determining the Part and the Whole in Percent Problems ● Determining a Part Given a Percent and a Whole ● Determining a Whole Given a Percent and a Part ● Calculating Parts and Wholes in Percent Problems **Unit 8: Using Ratio Reasoning to Convert Units** ● Converting Within Systems ● Converting Between Systems **Unit 9: Introduction to Unit Rates** ● Determining and Comparing Unit Rates	
Algebraic Reasoning	**6.EE.B.6**	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 1: Expressions** Lesson 3: Second Verse, Same as the First: Equivalent Expressions **Topic 2: Equations** Lesson 1: First Among Equals: Reasoning with Equal Expressions Lesson 2: Double Talk: Solving One-Step Addition Equations Lesson 3: Play It In Reverse: Solving One-Step Multiplication Equations Lesson 5: Getting Real: Solving Equations to Solve Problems **MATHia** **Unit 2: Introduction to Algebraic Expressions** ● Patterns and One-Step Expressions **Unit 12: Multiple Representations of Equations** ● Patterns and One-Step Equations ● Problem Solving Using Multiple Representations in the First Quadrant ● Problem Solving with Decimals	19 days

Algebraic Reasoning ***(Continued)***	**6.EE.B.7**	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 2: Equations** Lesson 2: Double Talk: Solving One-Step Addition Equations Lesson 3: Play It In Reverse: Solving One-Step Multiplication Equations Lesson 5: Getting Real: Solving Equations to Solve Problems **MATHia** **Unit 4: Using Algebraic Expressions to Analyze and Solve Problems** ● Using Picture Algebra with Addition, Subtraction and Multiplication ● Using Picture Algebra with Multiplication, Total Given ● Using Picture Algebra with Addition and Subtraction, Total Given **Unit 6: Solving One-Step Addition and Subtraction Equations** ● Exploring One-Step Equations with Double Number Lines ● Using Double Number Lines to Solve One-Step Addition Equations ● Solving with Addition and Subtraction **Unit 7: Solving One-Step Multiplication and Division Equations** ● Using Double Number Lines to Solve One-Step Multiplication Equations ● Solving with Multiplication and Division ● Solving One-Step Equations **Unit 8: Solving One-Step Equations with Decimals and Fractions** ● Solving One-Step Equations with Decimals ● Solving One-Step Equations with Fractions **Unit 11: Using Graphs to Solve Problems** ● Graphs of Additive and Multiplicative Relationships ● Comparing Additive and Multiplicative Relationships **Unit 12: Multiple Representations of Equations** ● Patterns and One-Step Equations ● Problem Solving Using Multiple Representations in the First Quadrant ● Problem Solving with Decimals	

Algebraic Reasoning ***(Continued)***	**6.EE.C.9**	**MATHbook** **Module 3: Determining Unknown Quantities** **Topic 3: Graphing Quantitative Relationships** Lesson 1: Every Graph Tells a Story: Independent and Dependent Variables Lesson 2: The Power of the Intersection: Using Graphs to Solve One-Step Equations Lesson 3: Planes, Trains, and Paychecks: Multiple Representations of Equations Lesson 4: Triathlon Training: Relating Distance, Rate, and Time **MATHia** **Unit 2: Introduction to Algebraic Expressions** ● Patterns and One-Step Expressions **Unit 10: Independent and Dependent Variables** ● Modeling Scenarios with Equations ● Analyzing Models of One-Step Linear Relationships **MATHbook** **Module 4: Moving Beyond Positive Quantities** **Topic 2: The Four Quadrants** Lesson 3: There are Many Paths . . .: Problem Solving on the Coordinate Plane **MATHia** **Unit 6: Problem Solving on the Coordinate Plane** ● Writing an Expression from a Scenario, Table, or Graph ● Solving One-Step Equations Using Multiple Representations in Four Quadrants	
Statistics and Distributions	**6.SP.A.1**	**MATHbook** **Module 5: Describing Variability of Quantities** **Topic 1: The Statistical Process** Lesson 1: What's Your Question?: Understanding the Statistical Process **MATHia** **Unit 1: Understanding the Statistical Process** ● Analyzing Distributions with Shape, Center, and Spread	20 days

Statistics and Distributions ***(Continued)***	**6.SP.A.2**	**MATHbook** **Module 5: Describing Variability of Quantities** **Topic 1: The Statistical Process** Lesson 3: Skyscrapers: Using Histograms to Display Data **Topic 2: Numerical Summaries of Data** Lesson 1: In the Middle: Analyzing Data Using Measures of Center Lesson 2: Box It Up: Displaying the Five-Number Summary Lesson 3: March MADness: Mean Absolute Deviation **Topic 5: Describing Variability of Quantities** Lesson 2: Get in Shape: Analyzing Numerical Data Displays	
	6.SP.A.3	**MATHbook** **Module 5: Describing Variability of Quantities** **Topic 2: Numerical Summaries of Data** Lesson 1: In the Middle: Analyzing Data Using Measures of Center Lesson 2: Box It Up: Displaying the Five-Number Summary Lesson 3: March MADness: Mean Absolute Deviation **MATHia** **Unit 6: Mean Absolute Deviation** ● Calculating Mean Absolute Deviation ● Using Mean Absolute Deviation	
	6.SP.B.4	**MATHbook** **Module 5: Describing Variability of Quantities** **Topic 1: The Statistical Process** Lesson 2: Get in Shape: Analyzing Numerical Data Displays Lesson 3: Skyscrapers: Using Histograms to Display Data **Topic 2: Numerical Summaries of Data** Lesson 2: Box It Up: Displaying the Five-Number Summary **MATHia** **Unit 2: Analyzing Numeric Data Displays** ● Creating Dot Plots **Unit 3: Using Histograms to Display Data** ● Creating Histograms **Unit 5: Displaying the Five-Number Summary** ● Introduction to Box Plots ● Creating Box Plots	

Statistics and Distributions ***(Continued)***	**6.SP.B.5**	**MATHbook** **Module 5: Describing Variability of Quantities** **Topic 1: The Statistical Process** Lesson 2: Get in Shape: Analyzing Numerical Data Displays Lesson 3: Skyscrapers: Using Histograms to Display Data **Topic 2: Numerical Summaries of Data** Lesson 1: In the Middle: Analyzing Data Using Measures of Center Lesson 2: Box It Up: Displaying the Five-Number Summary Lesson 3: March MADness: Mean Absolute Deviation Lesson 4: You Chose . . . Wisely: Choosing Appropriate Measures **MATHia** **Unit 1: Understanding the Statistical Process** ● Analyzing Distributions with Shape, Center, and Spread **Unit 2: Analyzing Numeric Data Displays** ● Interpreting Dot Plots **Unit 3: Using Histograms to Display Data** ● Introduction to Histograms ● Exploring Histograms **Unit 4: Analyzing Data Using Measures of Center** ● Calculating Mean, Median, Mode, and Range ● Determining Measures of Center ● Measuring the Effects of Changing Data Sets **Unit 5: Displaying the Five-Number Summary** ● Exploring Box Plots ● Interpreting Box Plots **Unit 6: Mean Absolute Deviation** ● Calculating Mean Absolute Deviation ● Using Mean Absolute Deviation **Unit 7: Choosing Appropriate Measures** ● Choosing Appropriate Measures	

1 Composing and Decomposing

Pacing: 34 Sessions

Topic 1: Factors and Multiples

In this topic, students extend their knowledge of area and number to compose and decompose areas that represent numeric expressions. They decompose numbers into factors and apply the Distributive Property to compute products efficiently. Students use the Distributive Property to express sums of two numbers as a product of two factors. They then use their knowledge of factors to determine the greatest common factors and least common multiples.

Standards: 5.NF.4, 5.NF.5a, 5.NF.6, 6.NS.1, 6.NS.4, 6.EE.1, 6.EE.2b, 6.EE.3 **Pacing:** 12 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**Taking Apart Numbers and Shapes** Writing Equivalent Expressions Using the Distributive Property	6.EE.2b 6.EE.3	1	Students divide area models in different ways to see that the sum of the areas of the smaller regions equals the area of the whole model. They then rewrite the product of two factors as a factor times the sum of two or more terms, leading to the formalization of the Distributive Property.	• The area of a rectangle is the product of its length and width. • You can illustrate the Distributive Property using an area model of a rectangle with side lengths a and $(b + c)$. • The Distributive Property of Multiplication over Addition states that for any numbers a, b, and c, $a(b + c) = ab + ac$. • You can rewrite equivalent expressions using properties
2	**Searching for Common Ground** Identifying Common Factors and Common Multiples	6.NS.4 6.EE.1	2	Students create rectangles with given areas and relate their dimensions to factors and common factors. They use prime factorizations to determine the greatest common factor (GCF) and least common multiple (LCM) of two numbers. Students examine the rows and columns of an area model to identify multiples and the LCM. They describe the relationship between the product, GCF, and LCM.	• Prime factorization is a method to determine common factors and common multiples of two numbers. • The greatest common factor (GCF) of two numbers is the largest factor shared by the two numbers. • The least common multiple (LCM) of two numbers is the smallest nonzero multiple shared by the two numbers. • You can use the Commutative and Distributive Properties to generate equivalent expressions. • If two numbers a and b are relatively prime, then the GCF $(a, b) = 1$ and the LCM $(a, b) = ab$.
3	**Composing and Decomposing Numbers** Least Common Multiple and Greatest Common Factor	6.NS.4	1	Students continue to expand their understanding of factors, multiples, common factors, and common multiples as introduced in previous lessons. They use greatest common factors (GCF) and least common multiples (LCM) to solve problems.	• Number relationships are useful in solving problems in context. • Common factors help determine how to divide or share things equally. • Common multiples help determine how things with different cycles can occur at the same time.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**Did You Get the Part?** Multiplying Fractions	5.NF.4 5.NF.6	1	Students review the area model for multiplication and apply it to multiplying mixed numbers. They analyze two methods for multiplying mixed numbers and then use these methods to answer questions in the context of a real-world scenario.	• You can use area models to illustrate the multiplication of two fractions, which is the same as taking a part of a part. • You can tile an area model representing the multiplication of two mixed numbers with fractional unit squares to express the product as an improper fraction. • The product of two fractions represented by an area model is the same as the product of the fractions calculated using the standard algorithm.
5	**Yours IS the Reason Why!** Fraction by Fraction Division	6.NS.1	3	Students connect multiplication to division by writing fraction fact families for area models. They then use fraction strip and number line models to investigate the division of fractions by fractions. Students use these models to develop an algorithm for rewriting division sentences as multiplication sentences. They apply the procedure to solve problems involving fractions and mixed numbers.	• You can use area models and fact families to illustrate the quotients of fractions. • The reciprocal or multiplicative inverse of a number a/b is the number b/a, where a and b are nonzero numbers. • To calculate the quotient of two fractions, multiply the dividend by the reciprocal of the divisor. There are other algorithms to divide fractions, such as dividing across and using complex fractions as a form of 1.
Learning Individually with MATHia or Skills Practice		5.NF.5a 6.NS.1 6.NS.4 6.EE.3	4	**MATHia Unit:** Writing Equivalent Expressions Using the Distributive Property **MATHia Workspaces:** Commutative and Associative Properties / Exploring the Distributive Property with Numeric Expressions / Using the Distributive Property with Numeric Expressions **MATHia Unit:** Identifying Common Factors and Common Multiples **MATHia Workspaces:** Prime Factorization / Determining the LCM or GCF of Two Numbers / Using the GCF to Rewrite the Sum of Two Numbers **MATHia Unit:** Multiplying Fractions **MATHia Workspaces:** Multiplying by Fractions to Increase or Decrease Quantities **MATHia Unit:** Fraction by Fraction Division **MATHia Workspaces:** Representing Fraction Division / Interpreting Remainders Using Models / Developing the Fraction Division Algorithm / Multiplying and Dividing Rational Numbers	

Topic 2: Area, Volume, and Surface Area

In this topic, students investigate how to compose or decompose different shapes into rectangles. They use what they know about the area of rectangles to develop the area formulas for parallelograms, triangles, trapezoids, and composite figures.

Standard: 6.G.1, 6.G.2, 6.G.4 **Pacing:** 14 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**All About that Base ... and Height** Area of Triangles and Quadrilaterals	6.G.1	2	Students progressively derive the formulas for the area of a parallelogram, triangle, and trapezoid by using composition and decomposition of polygons with known area formulas. They use their formulas to calculate the area of parallelograms, triangles, and trapezoids. They also generalize that triangles with congruent bases and congruent heights have the same area.	• The formula for the area of a parallelogram is $A = bh$, where A is the area of the parallelogram, b is the length of the base of the parallelogram, and h is the height of the parallelogram. • The formula for the area of a triangle is $A = \frac{1}{2}bh$, where A is the area of the triangle, b is the length of the base of the triangle, and h is the height of the triangle. • The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area of the trapezoid, h is the height of the trapezoid, and b_1 and b_2 are the bases.
2	**Slicing and Dicing** Composite Figures	6.G.1	2	Students calculate the area of complex figures. They compare two methods: decomposing a figure into familiar shapes and composing a figure into a rectangle. Students then solve problems in context, including the area of countries using map scales to approximate areas. They use given dimensions and problem solving to calculate the area of a triangle embedded in a square.	• You can determine the area of a composite figure by composing the figure into a rectangle and then subtracting the area of the shape that is not part of the composite figure. • You can determine the area of a composite figure by decomposing the figure into triangles, rectangles, parallelograms, or trapezoids and then adding the areas of those figures. • When calculating the area of composite figures using a map, you may need to determine dimensions using a scale.
3	**Length, Width, and Depth** Deepening Understanding of Volume	6.G.1 6.G.2	2	Students recall that they can calculate the volume of rectangular prisms using $V = lwh$ and $V = Bh$. They pack prisms with fractional side lengths using fractional unit cubes and then multiply the number of cubes by the volume of each unit cube. Students then practice solving real-world problems, including packing problems where the given container is only partially filled.	• A polyhedron is a three-dimensional figure that has polygons as faces. • Volume is the amount of space occupied by an object. You measure the volume of an object in cubic units. • The formula for the volume of a rectangular prism is $V = lwh$, where l is the length, w is the width and h is the height, or $V = Bh$, where B is the area of the base and h is the height. • You can calculate the volume of a right rectangular prism with fractional edge lengths by packing it with appropriate fractional cubes and show that it is the same as when you multiply the edge lengths of the prisms.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**Breaking the Fourth Wall** Surface Area of Prisms and Pyramids	6.G.4	2	Students represent a three-dimensional solid as a two-dimensional net. They then use nets to calculate the surface area of right rectangular prisms, triangular prisms, square pyramids, and triangular pyramids. They solve surface area problems in context.	• A net is a two-dimensional representation of a three-dimensional geometric figure. • To determine the surface area of a three-dimensional figure, calculate the sum of the areas of its faces.
Learning Individually with MATHia or Skills Practice		6.G.1 6.G.2 6.G.4	6	**MATHia Unit:** Area of Triangles and Quadrilaterals **MATHia Workspaces:** Calculating Area of Rectangles / Developing Area Formulas / Calculating Area of Various Figures **MATHia Unit:** Composite Figures **MATHia Workspaces:** Solving Area Problems / Calculating Area of Composite Figures **MATHia Unit:** Deepening Understanding of Volume **MATHia Workspaces:** Determining Volume Using Unit Fraction Cubes / Calculating Volume of Right Rectangular Prisms **MATHia Unit:** Surface Area of Rectangular Prisms and Pyramids **MATHia Workspaces:** Determining Surface Area Using Nets / Calculating Surface Area of Prisms and Pyramids Using Nets	

Topic 3: Decimals

In this topic, students begin by reviewing number skills developed in previous grades: plotting decimals on a number line and comparing and ordering decimal values. They then use place value strategies to establish the standard algorithm for adding and subtracting decimals.

Standards: 5.NBT.1, 5.NBT.3b, 6.NS.2, 6.NS.3, 6.G.1, 6.G.2 **Pacing:** 8 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**You Have a Point** Plotting, Comparing, and Ordering Rational Numbers	5.NBT.1 5.NBT.3b	1	Students investigate place value by using a human number line to plot decimal values. They plot given decimals on a number line and identify other decimals that lie between them. Students create a rule to compare decimals and apply their rule in context. They use a number line to compare decimals and fractions.	• A decimal is a number written in a system based on multiples of 10 and is another way to represent parts of a whole. • You can plot any decimal value on a number line by determining which two known values it lies between. • There is always a value between any two points on a number line. • When comparing two decimal values, rewrite them so that they have the same number of decimal places. • When comparing a fraction and a decimal, consider their placements on a number line.
2	**Get in Line** Adding and Subtracting Decimals	6.NS.3	1	Students use place value to estimate sums and differences of decimals and then develop standard algorithms. They solve real-world problems by first determining whether they need to add or subtract, using estimation to predict the magnitude of the answer, and then applying the standard algorithm. Students play a calculator game to target place value in subtraction.	• Estimating the decimal sum or difference before completing a calculation is a useful strategy to determine whether the actual answer is reasonable. • When you add or subtract decimals, it is important to align the digits in like place values.
3	**Product Placement** Multiplying Decimals	6.NS.3 6.G.1 6.G.2	1	Returning to the area model, students represent the multiplication of two decimals less than one on a hundredths grid. They use estimation to reason about decimal point placement in multiplication problems and then analyze patterns to develop the algorithm for multiplying decimals. Students solve area and volume problems that require multiplying, adding, and subtracting decimals.	• You can use an area model to represent the product of two decimals less than one. • You can use estimation to determine whether the product of two decimal factors is reasonable. • When multiplying decimals, the number of decimal places in the product is equal to the sum of the decimal places in the factors. • You can use the standard algorithms for decimal addition, subtraction, and multiplication to solve real-world problems.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**Dividend in the House** Dividing Whole Numbers and Decimals	6.NS.2 6.NS.3 6.G.1 6.G.2	3	Students learn the standard algorithm for long division with whole numbers. They demonstrate how the algorithm works for decimal dividends by relating it to a model, and they make sense of how to modify the algorithm for decimal divisors. Students solve area, surface area, and volume problems requiring decimal division.	• The long division algorithm uses an organized estimation process to determine the quotient. • When a quotient has a remainder, the situation informs how to interpret the remainder. • When you have a decimal divisor, multiply it by a power of ten to convert it to a whole number. Then, multiply the dividend by the same power of ten. Because you multiplied both the dividend and divisor by the same power of ten, the quotient remains the same. • You can use the standard algorithm for whole number and decimal division to solve real-world problems. • Use estimation to determine whether the quotient of a division problem is reasonable.
Learning Individually with MATHia or Skills Practice		6.NS.3 6.G.2	2	**MATHia Unit:** Adding and Subtracting Decimals **MATHia Workspaces:** Adding and Subtracting Decimals / Decimal Sums and Differences **MATHia Unit:** Multiplying Decimals **MATHia Workspaces:** Exploring Decimal Facts / Patterns with Products and Quotients / Multiplying Decimals / Decimal Products **MATHia Unit:** Dividing Decimals **MATHia Workspaces:** Dividing Decimals / Whole Number and Decimal Quotients / Solving Real-World Problems Using Decimal Operations	

2 Relating Quantities

Pacing: 36 Sessions

Topic 1: Ratios

In this topic, students engage in high-level representational and definitional thinking about ratios. The focus is on ratio reasoning and preparing students to apply this reasoning in future topics and courses. They begin by associating ratios with multiplicative comparisons, contrasting them with additive comparisons. Students learn about quantitative relationships represented by ratios, which they write in different forms. They then consider percents as a special type of ratio: a rate per 100.

Standards: 6.RP.1, 6.RP.3, 6.RP.3a **Pacing:** 19 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**It's All Relative** Introduction to Ratios	6.RP.1	2	Students differentiate between additive and multiplicative reasoning in preparation for the study of ratios. They use the term *ratio* to identify a comparison between two quantities using multiplicative reasoning. They compare quantities using part-to-part and part-to-whole ratios written in words, colon notation, and fractional form. They identify fractions and percents as part-to-whole ratios.	• Additive reasoning focuses on the use of addition and subtraction for comparisons. Multiplicative reasoning focuses on the use of multiplication and division. • A ratio is a comparison of two quantities that uses division. You can write a ratio as a part-to-part or part-to-whole relationship. • You can express ratios in words, with colon notation, and in fractional form. • A percent is a part-to-whole ratio where the whole is 100.
2	**Going Strong** Comparing Ratios to Solve Problems	6.RP.1 6.RP.3	2	Students explore ratios in real-world situations. They decide which of two or more ratios in each situation is greater using qualitative or quantitative reasoning. Students compare part-to-part and part-to-whole ratios represented pictorially, verbally, and numerically. In this lesson, students focus on reasoning more than computation.	• Qualitative reasoning is reasoning without measuring or counting numeric values. • Quantitative reasoning is reasoning using measuring or counting numeric values. When you compare ratios, you are using quantitative reasoning. • You can express equivalent ratios as part-to-part comparisons and part-to-whole comparisons using various notations. • You can use ratios to make comparisons and predictions.
3	**Different but the Same** Determining Equivalent Ratios	6.RP.1 6.RP.3	3	Students use multiple strategies to determine the relationship between two quantities: drawing models, building tape diagrams, completing tables, scaling up and down with proportions, and constructing double number lines. They use these strategies to write equivalent ratios, convert between measurements, and solve real-world problems.	• Equivalent ratios represent the same part-to-part or part-to-whole relationship. • You can use several strategies to write equivalent ratios, such as drawing models, building tape diagrams, completing tables, scaling up and down with proportions, and constructing double number lines. • A proportion contains two equal ratios. • You can write an equivalent ratio by setting up a proportion and scaling up or down. • A double number line consists of two number lines with intervals on each number line maintaining the same ratio.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**A Trip to the Moon** Using Tables to Represent Equivalent Ratios	6.RP.1 6.RP.3a	2	Students use tables in different ways to determine equivalent ratios. They multiply or divide existing ratios by a common factor to determine equivalent ratios in a table, just as they did in scaling. Students learn that they can add existing ratios to form new equivalent ratios. They complete equivalent ratio tables for different proportional situations.	• You can use ratio tables to generate equivalent ratios. • The sum or difference of two equal ratios creates a third equivalent ratio. • Multiplication or division of both quantities in a ratio by the same constant creates an equivalent ratio.
5	**They're Growing!** Graphs of Ratios	6.RP.1 6.RP.3a	3	Students compare rectangles with a common ratio and rectangles with a constant difference in side lengths. They graph the rectangles' dimensions on a coordinate plane and conclude that equivalent ratios represented on a coordinate plane form a line that passes through the origin. Students analyze ratios and solve problems in context using tables, double number lines, and graphs.	• You can represent a ratio relationship graphically as a line that passes through the origin. All coordinate pairs (x, y) have the same ratio y/x. • Not all lines represent ratio relationships. Lines that do not pass through the origin do not represent a ratio relationship. • You use the same process to generate equivalent ratios, whether using a ratio table, double number line, or graph. To generate another equivalent ratio, add or subtract equivalent ratios or multiply an equivalent ratio by a constant. • You can use a graph to solve real-world ratio problems by identifying the corresponding quantity of a given part of a ratio. • Multiplicative relationships, expressed as $y = kx$, are ratio relationships.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
6	**One Is Not Enough** Using and Comparing Ratio Representations	6.RP.1 6.RP.3a	2	Students compare ratios on a coordinate plane. They plot non-equivalent ratios and use estimation to determine a ratio that satisfies a situation and compare three setsof equivalent ratios in context. Students solve problems using double number lines, graphs, and tables. They compare these three models as well as scaling up and down to write equivalent ratios.	• A graph is a useful visual representation to interpret and compare ratios in real-world situations. • When comparing ratios on the same graph, the steepest line shows the largest $y : x$ ratio. • You can compare ratios and solve ratio problems without writing the ratios in lowest terms. • You can write equivalent ratios by using scaling, ratio tables, double number lines, and graphs.
Learning Individually with MATHia or Skills Practice		6.RP.1 6.RP.3a	5	**MATHia Unit:** Introduction to Ratios **MATHia Workspaces:** Differentiating Additive and Multiplicative Relationships / Understanding Ratio Relationships **MATHia Unit:** Determining Equivalent Ratios **MATHia Workspaces:** Introduction to Double Number Lines / Using Double Number Lines to Determine Equivalent Ratios / Problem Solving with Equivalent Ratios and Rates Using Double Number Lines **MATHia Unit:** Using Tables to Represent Equivalent Ratios **MATHia Workspaces:** Introduction to Ratio Tables / Using Tables to Determine Equivalent Ratios / Problem Solving with Equivalent Ratios and Rates Using Tables **MATHia Unit:** Graphs of Ratios **MATHia Workspaces:** Using Graphs to Determine Equivalent Ratios / Problem Solving with Equivalent Ratios and Rates Using Graphs **MATHia Unit:** Using and Comparing Ratio Representations **MATHia Workspace:** Multiple Representations of Ratios	

Topic 2: Percents

In this topic, students transition from general ratio reasoning to focusing on one type of ratio. Students define a percent multiple ways: a ratio in which the whole is 100; a fraction with a denominator of 100; and a decimal to the hundredths place.

Standard: 6.RP.3c **Pacing:** 8 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**We Are Family!** Percent, Fraction, and Decimal Equivalence	6.RP.3c	2	Students consider a percent as a part-to-whole ratio with a whole of 100. They estimate the percent of a figure that is shaded. Students represent survey results using a hundredths grid, fraction, decimal, and percent. They label common fractiondecimal-percent equivalents on a number line and play a game to commit them to memory.	• A percent is a part-to-whole ratio with a whole of 100. • To convert a decimal to a percent, multiply the decimal by 100. To convert a percent to a decimal, divide the percent by 100. • When the denominator of a fraction is a factor of 100, scale up the fraction to write it as a percent. Otherwise, rewrite the fraction as a decimal and then write that number as a percent. • You can interpret part-to-whole ratio relationships as percents.
2	**Warming the Bench** Using Estimation and Benchmark Percents	6.RP.3c	2	Students order sets of numbers represented as decimals, fractions, or percents. They use a tape diagram to relate 100%, 50%, 25%, 20%, 10%, 5%, and 1% and establish a rule to calculate 1% and 10% of any number. Students use benchmark percents to calculate any whole number percent of a number in mathematical and real-world situations.	• A benchmark percent is a percent that is commonly used, such as 1%, 5%, 10%, 25%, 50%, and 100%. • Calculating 1% of any number is the same as dividing by 100 or moving the decimal point two places to the left. • Calculating 10% of any number is the same as dividing by 10 or moving the decimal point one place to the left. • You can use benchmark percents to perform mental estimation and calculation of percents of a number.
3	**The Forest for the Trees** Determining the Part and the Whole in Percent Problems	6.RP.3c	2	Students encounter percent problems where they must solve for the part or the whole. They conclude that the most efficient methods to determine the part are multiplying the whole by the decimal equivalent of the percent or using benchmark percents. Students use double number lines and proportions to calculate the whole, including solving problems involving area, volume, and surface area.	• In a percent problem, you may have to solve for the percent, part, or whole. • You can solve percent problems using various methods, such as multiplication, division, benchmarks, double number lines, and the proportion part/whole = %/100. • One way to calculate a percent is to divide the part by the whole and multiply by 100. • There are two efficient methods to calculate the percent of any number regardless of the percent value: multiplying the whole by the decimal equivalent of the percent and using benchmark percents. • You can solve a percent problem as part of a multi-step solution to a real-world problem.
Learning Individually with MATHia or Skills Practice		6.RP.3c	2	**MATHia Unit:** Percent, Fraction, and Decimal Equivalence **MATHia Workspaces:** Percent Models / Fraction, Decimal, Percent Conversions **MATHia Unit:** Determining the Part and the Whole in Percent Problems **MATHia Workspaces:** Determining a Part Given a Percent and a Whole / Determining a Whole Given a Percent and a Part / Calculating Part and Wholes in Percent Problems	

Topic 3: Unit Rates and Conversions

In this topic, students explore unit rates using a previously learned skill: measurement conversions. They learn that converting within and between systems of measurement involves conversion rates, another special type of ratio. Students use their knowledge of multiplicative and reasoning to convert within and between measurement systems. They solve various unit rate problems. Students analyze real-world situations and identify unit rates from tables and graphs.

Standards: 6.RP.2, 6.RP.3b, 6.RP.3d **Pacing:** 9 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**Many Ways to Measure** Using Ratio Reasoning to Convert Units	6.RP.3d	2	Students compare measurements within and between the U.S. customary and metric systems. They express conversion equations as a ratio in fractional form and use ratio reasoning in double number lines, ratio tables, and proportions to convert units. Students make sense of unit analysis and use this method to convert units.	• When you convert a smaller unit of measure to a larger unit of measure, the larger unit of measure has fewer units. • When you convert a larger unit of measure to a smaller unit of measure, the smaller unit of measure has more units. • You can rewrite conversion equations as ratios in fractional form. • Strategies to convert measurements to different units include double number lines, ratio tables, proportions, and unit analysis. • Unit analysis is a strategy to convert units within and between measurement systems.
2	**What Is the Best Buy?** Introduction to Unit Rates	6.RP.2 6.RP.3b	3	Students use their understanding of ratios to solve problems using rate, defined as a special type of ratio. They write two unit rates for the same situation and consider which one is most useful based on the question. Students solve problems by determining the better buy, comparing rates in real-world situations, and using rates to make predictions.	• A rate is a ratio in which the measurements of the two compared quantities are different units. • A unit rate compares two measurements in which the numerator or denominator has a value of one unit. • The most useful form of a unit rate depends on the given situation. • You can use unit rates to calculate best buys, make comparisons, and make predictions. • When using unit rates to make the best buy, the best buy is the lowest cost per item or the highest amount of time per dollar.
3	**Seeing Things Differently** Multiple Representation of Unit Rates	6.RP.3b	2	Students develop flexible thinking with unit rates as they problem-solve with graphs of unit rates. They compare a speedometer to a double number line, investigate speed on an incline, explore the ratios in a Golden Rhombus, and consider a cost per weight situation.	• You can generate graphs using unit rates in real-world scenarios and use them to solve problems. • Equivalent rates form a straight line that passes through the origin. • You can use unit rates to make comparisons. • The points (x, 1) and (1, y) on the graph of a line represent the unit rates.
Learning Individually with MATHia or Skills Practice		6.RP.2 6.RP.3b 6.RP.3d	2	**MATHia Unit:** Using Ratio Reasoning to Convert Units **MATHia Workspaces:** Converting Within Systems / Converting Between Systems **MATHia Unit:** Introduction to Unit Rates **MATHia Workspaces:** Understanding Unit Rates / Determining and Comparing Unit Rates	

3 Determining Unknown Quantities

Pacing: 33 Sessions

Topic 1: Expressions

In this topic, students build on their existing knowledge of operations and geometric measurement to develop their understanding of variables and algebraic expressions. Students formalize their understanding of powers as repeated multiplication and evaluate expressions involving whole-number exponents, expanding their application of the Order of Operations to include exponents.

Standards: 6.EE.1, 6.EE.2, 6.EE.2a, 6.EE.2b, 6.EE.2c, 6.EE.3, 6.EE.4, 6.EE.6, 6.EE.7 **Pacing:** 13 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**Relationships Matter** Evaluating Numeric Expressions	6.EE.1	2	Students use area and volume to make sense of exponential expressions. They evaluate expressions with exponents, including powers where the base is a sum. Students complete a sort where they match numeric expressions with geometric models. They use the Order of Operations to evaluate numeric expressions and to justify their steps.	• To evaluate a numeric expression means to rewrite the expression to get a single value. • You can represent repeated multiplication as a power composed of two elements: the base and the exponent. • The Order of Operations is a set of rules that ensures the same result every time anyone evaluates an expression.
2	**Into the Unknown** Introduction to Algebraic Expressions	6.EE.2 6.EE.2a 6.EE.2b 6.EE.2c	2	Students translate mathematical phrases to numeric expressions with mathematical symbols. They use arithmetic to solve a series of problems and generalize the pattern to write an algebraic expression for the situation. Students substitute a given value for a variable and then evaluate a mathematical expression. They use vocabulary such as *coefficient*, *term*, and *evaluate*.	• An algebraic expression is an expression that has at least one variable. • A number that is multiplied by a variable in an algebraic expression is a coefficient. When a variable does not show a coefficient, then it is understood to be 1. • Algebraic expressions can have one or more terms. A term of an algebraic expression is a number, variable, or product of numbers and variables. A term that consists of a number only is a constant; its value never changes. • Evaluating an algebraic expression means determining the value of the expression for a given value of each variable. • You can construct algebraic expressions to represent real-world situations and evaluate them to solve problems.
3	**Second Verse, Same as the First** Equivalent Expressions	6.EE.2a 6.EE.3 6.EE.6	3	Students use algebra tiles to make sense of combining like terms and applying the Distributive Property with multiplication and division. They apply these skills to rewrite algebraic expressions. They use the Distributive Property to factor expressions so that the coefficient of the variable is one. Students write algebraic expressions based on different perspectives in real-world situations.	• You can use algebra tiles to make sense of combining like terms and using the Distributive Property. • Like terms are two or more terms that have the same variable raised to the same power. • The Distributive Property states that if a, b, and c are any real numbers, then $a(b + c) = ab + ac$. • You can also apply the Distributive Property with subtraction and division expressions: $a(b - c) = ab - ac$, $a+b/c = a/c + b/c$, and $a-b/c = a/c - b/c$. • You can use the Distributive Property to factor an expression not only when the terms have a common factor but also to rewrite an algebraic expression so that the variable's coefficient is one.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**Are They Saying the Same Thing?** Verifying Equivalent Expressions	6.EE.4	1	Students apply the Commutative, Associative, and Distributive Properties to match examples, algebraic statements, and diagrams. They examine the characteristics of equivalent expressions using tables, graphs, and properties. They use graphs and properties to verify the equivalence of expressions.	• The Commutative Properties of Addition and Multiplication state that the order in which you add or multiply two or more numbers does not affect the sum or the product. • The Associative Properties of Addition and Multiplication state that changing the grouping of the terms in an addition or multiplication problem does not change the sum or product. • The Distributive Property states that if a, b, and c are any real numbers, then $a(b + c) = ab + ac$. • Two algebraic expressions are equivalent when the results are equal for every possible value for the variables. • You can use a graph or properties to verify two expressions are equivalent. You can use a table of values to show two expressions are not equivalent; however, a finite set of values in a table is not enough to verify equivalency.
Learning Individually with MATHia or Skills Practice		6.EE.1 6.EE.2a 6.EE.2b 6.EE.2c 6.EE.3 6.EE.6 6.EE.7	5	**MATHia Unit:** Evaluating Numeric Expressions **MATHia Workspaces:** Writing and Evaluating Exponent Expressions / Order of Operations / Applying the Order of Operations / Using Order of Operations to Evaluate Simple Numeric Expressions / Using Order of Operations to Evaluate Numeric Expressions with Four Operations / Using Order of Operations to Evaluate Numeric Expressions with Parentheses and Exponents / Using Order of Operations to Evaluate Numeric Expressions **MATHia Unit:** Introduction to Algebraic Expressions **MATHia Workspaces:** Writing Expressions from Verbal Descriptions / Patterns and One-Step Expressions / Identifying Parts of Simple Algebraic Expressions / Evaluating One-Step Expressions with Whole Numbers / Evaluating Two-Step Expressions with Whole Numbers / Evaluating Multi-Step Expressions / Evaluating Expressions with Multiple Variables **MATHia Unit:** Equivalent Algebraic Expressions **MATHia Workspaces:** Modeling Equivalent Algebraic Expressions / Exploring the Distributive Property with Algebraic Expressions / Using Order of Operations to Rewrite Simple Algebraic Expressions / Using Order of Operations to Rewrite Algebraic Expressions with Four Operations / Using Order of Operations to Rewrite Algebraic Expressions with Parentheses and Exponents / Using Order of Operations to Rewrite Algebraic Expressions **MATHia Unit:** Using Algebraic Expressions to Analyze and Solve Problems **MATHia Workspaces:** Using Picture Algebra with Addition, Subtraction, and Multiplication / Using Picture Algebra with Multiplication, Total Given / Using Picture Algebra with Addition and Subtraction, Total Given	

Topic 2: Equations

In this topic, students need to understand solving an equation as a process of reasoning to determine what numbers make equations true. They use what they learned in *Expressions* to understand the equals sign as an indicator of a relationship, not as an operator. Students use a double number line to visualize an equation as two equivalent expressions and create additional equivalent relationships.

Standards: 6.EE.5, 6.EE.6, 6.EE.7, 6.EE.8 **Pacing:** 9 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**First Among Equals** Reasoning with Equal Expressions	6.EE.6	1	Students learn that an equation is a statement of equality between two expressions. They determine an unknown number in an equation by rewriting the expressions on either side of the equal sign until they match. Students use a double number line and the Properties of Equality to build equations with the same solution.	• An equation is a statement of equality between two expressions. • A solution to an equation is any value for a variable that makes the equation true. • According to the Properties of Equality, when you perform the same operation with the same value to both sides of an equation, then the resulting equation is also true. • One way to determine the unknown number in an equation is to rewrite the expressions on both sides of the equal sign until they match.
2	**Double Talk** Solving One-Step Addition Equations	6.EE.6 6.EE.7	1	Students use double number lines to solve one-step addition equations of the form $p + x = q$, where p and q are whole numbers. They connect the structure of this model to inverse operations and solve one-step addition equations. Students reason about more complicated equations and then practice solving one-step addition equations with non-negative rational numbers.	• When you solve an equation, you determine the value of the unknown that makes the equation true. • You can use a double number line to represent and solve one-step addition equations. • Inverse operations are pairs of operations that reverse the effects of each other. • To solve a one-step addition equation, use the inverse operation of subtraction.
3	**Play It in Reverse** Solving One-Step Multiplication Equations	6.EE.6 6.EE.7	2	Students use double number lines and inverse operations to solve equations in the form $px = q$, where p and q are non-negative rational numbers. They use two inverse operation strategies to solve these equations: multiplying by the reciprocal of the coefficient of the variable or dividing. They also rewrite equations of the form $x/a = b$ as $(1/a)x = b$.	• You can use a double number line to represent and solve a one-step multiplication equation. • To solve a one-step multiplication equation, you can divide by the coefficient of the variable or multiply by the reciprocal of the coefficient of the variable.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**One, None, or a Ton** Solutions to Equations and Inequalities	6.EE.5 6.EE.8	1	Students analyze the structure of equations to determine whether they have one solution, no solutions, or an infinite number of solutions. They investigate inequalities and use a number line to express the solution set to a simple inequality or real-world numeric statement. Students write inequalities using variables based on the position of points on a number line.	• You can analyze an equation's structure to determine whether it has one solution, no solutions, or an infinite number of solutions. • The graph of an inequality in one variable is the set of all points on a number line that make the inequality true. • The values to the left of a number on a number line are less than the number, while the values to the number's right are greater than the number.
5	**Getting Real** Solving Equations to Solve Problems	6.EE.6 6.EE.7	1	Students solve the literal equations $A = bh$ and $d = rt$ in terms of different variables. To solve real-world problems, they define variables, write a one-step equation relating the variables, and solve for the unknown value. Students write their own word problems for a one-step addition and multiplication equations.	• A literal equation is an equation in which the variables represent specific measures. You most often see literal equations when you study formulas. • Given a literal equation, you can solve for any of the variables to express the relationship from a different perspective. • You can solve real-world problems using this mathematical process: define the variables, write an equation based upon the relationship and values provided, solve the equation, and interpret the solution. • A single equation can represent a variety of real-world problems.
Learning Individually with MATHia or Skills Practice		6.EE.5 6.EE.7 6.EE.8	3	**MATHia Unit:** Reasoning with Algebraic Expressions **MATHia Workspace:** Using Substitution to Identify Solutions to Equations **MATHia Unit:** Solving One-Step Addition and Subtraction Equations **MATHia Workspaces:** Exploring One-Step Equations with Double Number Lines / Using Double Number Lines to Solve One-Step Addition Equations (No Type In) / Using Double Number Lines to Solve One-Step Addition Equations (Type In) / Solving with Addition and Subtraction (No Type In) **MATHia Unit:** Solving One-Step Multiplication and Division Equations **MATHia Workspaces:** Using Double Number Lines to Solve One-Step Multiplication Equations (No Type In) / Using Double Number Lines to Solve One-Step Multiplication Equations (Type In) / Solving with Multiplication and Division (No Type In) / Solving One Step Equations (Type In) **MATHia Unit:** Solving One-Step Equations with Decimals and Fractions **MATHia Workspaces:** Solving One-Step Equations with Decimals (No Type In) / Solving One Step Equations with Decimals (Type In) / Solving One-Step Equations with Fractions (No Type In) / Solving One-Step Equations with Fractions (Type In) **MATHia Unit:** Solutions to Inequalities **MATHia Workspaces:** Using Substitution to Identify Solutions to Inequalities / Graphing Inequalities with Positive Rational Numbers / Writing Inequalities from Real-World Situations	

Topic 3: Graphing Quantitative Relationships

In this topic, students use multiple representations to model and solve problems. Focused on graphical representations, this topic is the culmination of the module, requiring students to use prior knowledge of graphing in the first quadrant of the coordinate plane and their new knowledge from the *Expressions* and *Equations* topics.

Standard: 6.EE.6, 6.EE.7, 6.EE.9 **Pacing:** 11 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**Every Graph Tells a Story** Independent and Dependent Variables	6.EE.9	3	Students match graphs with different characteristics to scenarios and identify the independent and dependent quantities in each scenario. They analyze two situations that reverse the independent and dependent quantities to understand that the asked question often determines which quantity is independent or dependent. They compare the tables, graphs, and equations that represent each situation.	• A discrete graph is a graph of isolated points, while a continuous graph is a graph with no breaks in it. • When one quantity depends on another in a real-world problem situation, it is the dependent quantity. The quantity on which it depends is called the independent quantity. • Represent the independent quantity in the first column in a table and the *x*-axis on a graph. Represent the dependent quantity in the second column in a table and the *y*-axis on a graph. • In an equation, the dependent variable is the isolated variable. The equation describes what operation(s) you perform on the independent quantity to calculate the dependent quantity's value. • You can determine whether a quantity is independent or dependent based on the situation and question.
2	**The Power of the Intersection** Using Graphs to Solve Problems	6.EE.9	1	Students use a situation to identify unknown independent and dependent quantities. They analyze a graph representing the situation, interpret the meaning of ordered pairs, and identify the unit rate. Students then use the graph to solve an equation by graphing a horizontal line at the value of the dependent quantity to identify the independent quantity.	• You can use a graph to identify an independent quantity by graphing a horizontal line at the dependent quantity's value. • When using a graph to answer a question, often you can only provide an approximation rather than an exact answer.
3	**Planes, Trains, and Paychecks** Multiple Representations of Equations	6.EE.9	2	Students analyze relationships represented as verbal descriptions, tables, graphs, and equations. Starting from one representation, they generate the others. Students identify the characteristics of each representation and choose the appropriate representation to provide approximations or exact answers. They complete a graphic organizer listing the advantages of each representation.	• Given any mathematical representation—scenario, table, graph, or equation—you can create the other representations. • Each representation has advantages and disadvantages. • When you use an equation, you will always get an exact answer. When you use a table or graph, you will sometimes get approximations.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**Triathlon Training** Relating Distance, Rate, and Time	6.EE.9	2	Students analyze a triathlon situation where distance is the independent variable and time is the dependent variable. They use rates expressed in a graph, table, or scenario to write two equations relating to distance and time. Students recognize the reciprocal relationship between the rates in their equations. They select the correct equation to solve for distance or time.	• You can use the equation $d = rt$ to relate distance, rate, and time. • Given a pair of equations relating distance and time, one with distance as the independent variable and one with time as the independent variable, the equations' rates will have a reciprocal relationship.
Learning Individually with MATHia or Skills Practice		6.EE.6 6.EE.7 6.EE.9	3	**MATHia Unit:** Independent and Dependent Variables **MATHia Workspaces:** Modeling Scenarios with Equations / Analyzing Models of One-Step Linear Relationships **MATHia Unit:** Using Graphs to Solve Problems **MATHia Workspaces:** Graphs of Additive and Multiplicative Relationships / Comparing Additive and Multiplicative Relationships **MATHia Unit:** Multiple Representations of Equations **MATHia Workspaces:** Patterns and One-Step Equations / Problem Solving Using Multiple Representations in the First Quadrant / Problem Solving with Decimals	

4 Moving Beyond Positive Quantities

Pacing: 17 Sessions

Topic 1: Signed Numbers

In this topic, students explore the entire system of rational numbers, including negative rational numbers. Through this topic's activities, they will see negative rational numbers as an extension of prior learning about number systems.

Standards: 6.NS.5, 6.NS.6a, 6.NS.6c, 6.NS.7a, 6.NS.7b, 6.NS.7c, 6.NS.7d, 6.NS.6, 6.NS.C.5, 6.NS.C.6a, 6.EE.8, 6.NS.C.7b **Pacing:** 7 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**Human Number Line** Introduction to Negative Numbers	6.NS.5 6.NS.6a 6.NS.6c 6.NS.7a 6.NS.7b	2	Students use the structure of a number line to make sense of negative numbers. They plot rational numbers and their opposites on a number line. Students investigate how the meaning of zero in a situation affects the placement of points on a number line. They compare rational numbers in the context of temperatures and profits/losses.	• You can reflect the positive numbers on a number line across 0 to create a number line with negative numbers. The numbers get smaller as you move to the left on a number line. • Opposite numbers reflect each other across 0 on the number line. You can interpret the negative symbol to mean the opposite of a number. • To accurately interpret a number line, you must know what zero means in the problem's context. If you change the meaning of zero on the number line, you must shift the points left or right while maintaining the same distance between those points. • A thermometer is an example of a vertical number line. The value of the numbers increases as you move up a vertical number line. • Regardless of the types of numbers you are comparing, when you place them on a number line, the number farther to the right is always the greater number.
2	**Magnificent Magnitude** Absolute Value	6.NS.7c 6.NS.7d	2	Students develop a conceptual understanding of the absolute value and calculate the absolute value of numbers. They interpret the meaning of absolute value as the magnitude for a positive or negative quantity in a real-world context and use absolute value to solve real-world problems. Students compare absolute value expressions using inequality symbols.	• The absolute value of a number is the number's distance from zero on a number line. • In everyday life, we often use absolute value statements to describe changes and comparisons of values. • You can use an absolute value expression to calculate the distance between positive and negative numbers in various contexts. • You can compare absolute value expressions by using the definition of absolute value and number lines.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
3	**What's in a Name?** Rational Number System	6.NS.6	1	Students complete a number sort. They learn the definitions of integers and rational numbers. Students analyze a diagram that shows how some sets of numbers are subsets of others and classify numbers as natural numbers, whole numbers, integers, or rational numbers. They make sense of the Density Property by identifying a rational number located between rational numbers.	• The set of integers includes the set of whole numbers with their opposites. You can represent the set of integers as { ..., − 3, − 2, − 1, 0, 1, 2, 3, ... } . • The set of rational numbers is the set of numbers you can write as a/b where a and b are integers and $b \neq 0$. • Natural numbers are a subset of whole numbers. Whole numbers are a subset of integers. Integers are a subset of rational numbers. • The Density Property states that between any two rational numbers there is another rational number.
Learning Individually with MATHia or Skills Practice		6.NS.5 6.NS.6 6.NS.6a 6.NS.7b 6.EE.8	2	**MATHia Unit:** Introduction to Negative Numbers **MATHia Workspaces:** Introduction to Negative Numbers / Representing Integers on Number Lines / Graphing Inequalities with Rational Numbers **MATHia Unit:** Absolute Value **MATHia Workspace:** Using Absolute Value **MATHia Unit:** Rational Number System **MATHia Workspace:** Classifying Rational Numbers	

Topic 2: The Four Quadrants

In this topic, students explore the four-quadrant coordinate plane. They use reflections of the first quadrant on patty paper and their knowledge of the rational number line to build a four-quadrant coordinate plane. Students look for patterns in the signs of the ordered pairs in each quadrant and for ordered pairs that lie along the vertical and horizontal axes.

Standards: 6.NS.6b, 6.NS.6c, 6.NS.8, 6.G.3, 6.NS.C.8, , 6.EE.C.9, 6.NS.C.6b, 6.NS.C.6c, 6.EE.9, 6.G.A.3 **Pacing:** 10 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**Four Is Better than One** Extending the Coordinate Plane	6.NS.6b 6.NS.6c 6.NS.8	3	Students extend the first quadrant of the coordinate plane to create the Cartesian coordinate plane. They identify points, plot points, and generalize the points located in each quadrant and points reflected across an axis. Students write an absolute value expression to calculate the distance between two horizontally- or vertically-aligned points on the coordinate plane.	• When you extend the *x*-axis and *y*-axis to include negative numbers, you create the Cartesian coordinate plane with four quadrants. • The coordinates of an ordered pair denote the quadrant location. • If one of the ordered pair's coordinates is zero, then the point lies on an axis. • Ordered pairs that differ only by their signs are reflections across one or both axes. • You can write and evaluate an absolute value expression to calculate the distance between pairs of points on a coordinate plane when they align horizontally or vertically.
2	**Playing with Planes** Graphing Geometric Figures	6.NS.8 6.G.3	2	Students solve geometry problems using the coordinate plane. They conjecture about graphed polygons and prove their conjectures. Students graph triangles and quadrilaterals using given criteria and calculate distances to solve perimeter, area, and volume problems. They then label a parallelogram's coordinates without a coordinate grid and write an algebraic expression to solve for its area.	• You can use the structure of the coordinate plane and properties of polygons to classify polygons. • You can use the structure of the coordinate plane and solve perimeter, area, and real-world problems. • You can use the coordinate plane structure without the grid with lattice points to represent and solve problems.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
3	**There Are Many Paths ...** Problem Solving on the Coordinate Plane	6.NS.8 6.EE.9	2	Students analyze a variety of graphs that lie on different quadrants of the coordinate plane. They interpret the meaning of coordinate pairs, identify rates, and write linear equations for graphs. Students also use graphs to interpret data. They discuss how different representations allow for various levels of accuracy when solving problems.	• A coordinate plane with four quadrants gives you the flexibility to represent different situations. • You have to consider the situation to know whether extending a graph into another quadrant makes sense. • You can use graphs other than lines to model real-life situations and display data. • You can use graphs to interpret data and changes in data. • Graphs, tables, equations, and scenarios provide different information and allow for various accuracy levels when solving problems. • A single graph may describe various situations.
Learning Individually with MATHia or Skills Practice		6.NS.6c 6.EE.9	3	**MATHia Unit:** Extending the Coordinate Plane **MATHia Workspaces:** Exploring Symmetry on the Coordinate Plane / Identifying and Interpreting Ordered Pairs / Plotting Points **MATHia Unit:** Graphing Geometric Figures **MATHia Workspace:** Drawing Polygons on the Coordinate Plane **MATHia Unit:** Problem Solving on the Coordinate Plane **MATHia Workspace:** Writing an Expression from a Scenario, Table, or Graph / Solving One-Step Equations Using Multiple Representations in Four Quadrants	

5 Describing Variability of Quantities

Pacing: 19 Sessions

Topic 1: The Statistical Process

In this topic, students learn a statistical problem-solving process: formulate questions, collect data, analyze data, and interpret the results. They will use this process throughout their studies of statistics, increasing the complexity of each step of the process as they develop their statistical literacy.

Standards: 6.SP.1, 6.SP.2, 6.SP.4, 6.SP.5a, 6.SP.5b, 6.SP.5c **Pacing:** 8 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**What's Your Question?** Understanding the Statistical Process	6.SP.1	2	Students engage in the four components of a statistical process. Given a real-world situation, they write statistical questions, collect data, create an appropriate display to analyze the data, and interpret the results. They use a graphic organizer to summarize their process. Students consider categorical data displayed using bar graphs and circle graphs.	• The statistical process has four components: formulating a statistical question, collecting appropriate data, analyzing the data graphically and numerically, and interpreting the results of the analysis. • A statistical question anticipates and accounts for variability in data. • Data are categorical or quantitative. Categorical data fit into several different groups or categories, while quantitative data lie on a numeric scale. • Methods of data collection include surveys, observational studies, and experiments. • You can record categorical data collected to answer statistical questions in a frequency table. You can display the data on a bar graph or a circle graph.
2	**Get in Shape** Analyzing Numeric Data Displays	6.SP.2 6.SP.4 6.SP.5a 6.SP.5b 6.SP.5c	2	Students create dot plots and stem-andleaf plots. They analyze and interpret the numeric data that these plots display. Students use the terms symmetric, skewed right, skewed left, and uniform to describe data distributions and the terms clusters, gaps, peaks, and outliers to identify distinguishing features of the data displays.	• You can display numeric data using dot plots and stem-and-leaf plots. • The terms *symmetric*, *skewed left*, *skewed right*, and *uniform* describe data distributions. • The terms *clusters*, *gaps*, *peaks*, and *outliers* identify the distinguishing features of data displays.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
3	**Skyscrapers** Using Histograms to Display Data	6.SP.2 6.SP.4 6.SP.5a 6.SP.5b 6.SP.5c	2	Students compare categorical data displayed in bar graphs with numeric data displayed in histograms. They discuss a histogram's features, construct histograms by first organizing the data in grouped frequency tables, and analyze and interpret the data in context. Students list the advantages and disadvantages of three numeric data displays: the dot plot, stem-and-leaf plot, and histogram.	• Bar graphs display categorical data, while histograms display discrete and continuous numeric data. • A histogram is a visual display of data from a grouped frequency table. • A data value that lies on one of the bounds of a histogram goes in the bin to the right of that bound.
Learning Individually with MATHia or Skills Practice		6.SP.1 6.SP.4 6.SP.5a	2	**MATHia Unit:** Understanding the Statistical Process **MATHia Workspace:** Analyzing Distributions with Shape, Center, and Spread **MATHia Unit:** Analyzing Numeric Data Displays **MATHia Workspaces:** Creating Dot Plots / Interpreting Dot Plots **MATHia Unit:** Using Histograms to Display Data **MATHia Workspaces:** Introduction to Histograms / Creating Histograms / Exploring Histograms	

Topic 2: Numeric Summaries of Data

In this topic, students learn about measures of central tendency and measures of variability and when each is the most appropriate to describe a data set. Students may have an informal or intuitive understanding of "average," but this topic formalizes the ideas of the mean and median of a data set. They learn that the median is the middle value in a set of data and that they can think of the mean as a fair share or balance point of a data set.

Standards: 6.SP.2, 6.SP.3, 6.SP.4, 6.SP.5, 6.SP.5a, 6.SP.5b, 6.SP.5c, 6.SP.5d **Pacing:** 11 Sessions

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
1	**In the Middle** Analyzing Data Using Measures of Center	6.SP.2 6.SP.3 6.SP.5c	2	Students explore the measures of center: mode, median, and mean. Through investigations, they develop a conceptual understanding of the mean as a fair share and as a balance point and then use the traditional algorithm to calculate the arithmetic average. Students analyze and interpret data in a situation using these measures of center.	• A measure of center for a numeric data set is a single value that summarizes all of its values. • Three measures of center are mode, median, and mean. • The median is the data value in the middle of a numerically ordered data set. • You can think about mean as a fair share or balance point of a data set. • The mean or arithmetic average equals the sum of the data values divided by the number of data values.
2	**Box It Up** Displaying the Five-Number Summary	6.SP.2 6.SP.3 6.SP.4 6.SP.5c	2	Students construct box-and-whisker plots and analyze and interpret the data displays by considering two measures of variation: the range and the IQR. They also compare data sets and decide which situation is best after considering the variation and center measures. Students respond to true-false questions based on their analysis of two vertical box-and-whisker plots.	• Quartiles are the numbers that split data into quarters. • The five-number summary includes the minimum, Q1, median, Q3, and maximum of a data set. • A box-and-whisker plot displays from the five-number summary. It shows the center and spread of the data to inform real-world decisions. • The range and IQR are measures of variation, meaning they describe the spread of the data. The range is the difference between the maximum and the minimum. The IQR is the difference between Q3 and Q1. • You can use compare multiple data sets using box-and-whisker plots.
3	**March MADness** Mean Absolute Deviation	6.SP.2 6.SP.3 6.SP.5a 6.SP.5b 6.SP.5c	1	Students compare the means of two data sets displayed with dot plots and discover the need for another measure of variation. They use the mean absolute deviation (MAD) to describe the spread of data. Students calculate and analyze the MAD to interpret data in context.	• Measures of variation describe the spread of the data values. • The mean absolute deviation (MAD) describes the spread of data when the mean is the measure of center. The IQR describes the spread of data when the median is the measure of center. • To calculate the MAD, determine the mean of the data. Subtract the mean from each data value and then take the absolute value of each difference. Calculate the mean (average) of the absolute value results. • You can use the MAD to inform real-world decisions.

Lesson	Title / Subtitle	Standards	Pacing*	Lesson Summary	Essential Ideas
4	**You Chose ... Wisely** Choosing Appropriate Measures	6.SP.5d	2	Students establish that the mean is the appropriate measure of center for symmetric distributions, while the median is better for skewed distributions. They relate this to variability, connecting MAD with the mean and IQR with the median. Students use center and variability measures to analyze and interpret data to choose the best option in a real-world situation.	• Extreme measures affect the mean but not the median of the data set. • For symmetric distributions, the mean is the appropriate measure of center, and the MAD is the appropriate measure of variability. • The median is the appropriate measure of center for skewed distributions, and the IQR is the appropriate measure of variability. • When a distribution skews left, the mean is less than the median. When it skews right, the mean is greater than the median. • When a distribution is symmetric, the mean and median are approximately equal.
Learning Individually with MATHia or Skills Practice		6.SP.3 6.SP.4 6.SP.5 6.SP.5c 6.SP.5d	4	**MATHia Unit:** Analyzing Data Using Measures of Center **MATHia Workspaces:** Calculating Mean, Median, Mode, and Range / Determining Measures of Center / Measuring the Effects of Changing Data Sets **MATHia Unit:** Displaying the Five-Number Summary **MATHia Workspaces:** Introduction to Box Plots / Creating Box Plots / Exploring Box Plots / Interpreting Box Plots **MATHia Unit:** Mean Absolute Deviation **MATHia Workspaces:** Calculating Mean Absolute Deviation / Using Mean Absolute Deviation **MATHia Unit:** Choosing Appropriate Measures **MATHia Workspace:** Choosing Appropriate Measures	

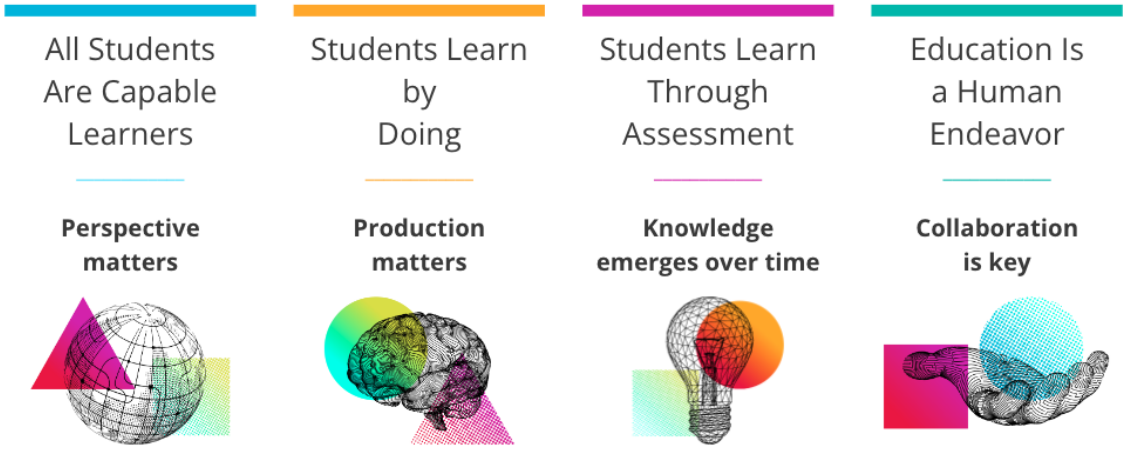
Total Sessions: 139

Learning Together: 96
Learning Individually : 43

Supports of Diversity, Equity and Inclusion

Please provide any information relative to supporting culturally responsive instruction, multi-language learners, and students with disabilities

At Carnegie Learning, we aim to make math accessible to every student, regardless of background, by delivering culturally responsive and racially diverse instructional materials. Resources follow best practices around equitable teaching and learning, classroom discourse, building relationships, collaborative learning, and more. Our guiding principles support development in these equitable practices.



Problems within Carnegie Learning's Math Solutions are written to reflect multiculturalism and include real-world scenarios and locations. Using proper names that reflect diverse cultures and situations found throughout rural and urban United States reduces linguistic and cultural bias. We regularly evaluate our resources through external partnerships for various forms of bias, microaggression, etc. All student characters within the instructional resources represent intelligent, curious learners with various interests.

Throughout the Teacher's Implementation Guide, interleaved notes on lesson pages provide teachers with point-of-use reminders to support language development, productive skills, and student interactions. The teacher materials include Additional Facilitation Notes consisting of differentiation strategies, common student misconceptions, and suggestions to extend certain activities.