



Attachment 4: Math Scope and Sequence, 6<sup>th</sup> Grade

		-Solve word problems using ratio and rate reasoning.	
<b>Unit 2: Rates and Percent (14 Days)</b>			
<p><b><u>The Number System</u></b></p> <p><b>Compute fluently with multi-digit numbers and find common factors and multiples.</b> Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation <b>CC.6.NS.B.3</b></p> <p><b>Apply and extend previous understandings of numbers to the system of rational numbers.</b></p> <p>Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. <b>CC.6.NS.C.8</b></p> <p><b><u>Ratios and Proportional Relationships</u></b></p> <p><b>Understand ratio concepts and use ratio reasoning to solve problems</b></p> <p>Understand the concept of a unit rate <math>a/b</math> associated with a ratio <math>a:b</math> with <math>b \neq 0</math>, and use rate language in the context of a ratio relationship. <i>For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is <math>3/4</math> cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."</i></p> <p><b>CC.6.RP.A.2</b></p> <p>Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. <b>CC.6.RP.A.3</b></p> <p>Solve unit rate problems including those involving unit pricing and constant speed. <i>For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate</i></p>	<p><b><u>The Number System:</u></b> Compute fluently with multi-digit numbers and find common factors and multiples.</p> <p>Apply and extend previous understandings of numbers to the system of rational numbers.</p> <p><b><u>Ratios and Proportional Relationships:</u></b> Understand ratio concepts and use ratio reasoning to solve problems</p>	<p><b><u>Essential Questions:</u></b> How can plotting points on a coordinate plane help us determine specific locations in real life?</p> <p>How is a ratio or rate used to compare two quantities or values?</p> <p><b><u>Learning Targets:</u></b></p> <ul style="list-style-type: none"> <li>- Fluently add, subtract, multiply and divide multi-digit decimals</li> <li>- Graph points in all four quadrants of a coordinate plane.</li> <li>- Find distances between points using my knowledge of coordinates and absolute value.</li> <li>- Explain the concept of unit rate</li> <li>- Describe a ratio relationship using rate language</li> <li>- Explain the relationship between</li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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<p><i>were lawns being mowed?</i><b>CC.6.RP.A.3b</b></p> <p>Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.<b>CC.6.RP.A.3c</b></p> <p><b>CCSS for Mathematical Practices</b></p> <ol style="list-style-type: none"> <li>2. Reason abstractly and computationally.</li> <li>5. Use appropriate tools strategically.</li> <li>7. Look for and make sure of structure.</li> </ol>		<p>rate, ratio and percent</p> <ul style="list-style-type: none"> <li>- Solve word problems using ratio and rate reasoning.</li> </ul>	
<p><b>Unit 3: Multi Digit Computation (11 Days)</b></p>			
<p><b><u>The Number System</u></b></p> <p><b>Compute fluently with multi-digit numbers and find common factors and multiples.</b></p> <p>Fluently divide multi-digit numbers using the standard algorithm.<b>CC.6.NS.B.2</b></p> <p>Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. <b>CC.6.NS.B.3</b></p> <p>Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. <b>CC.6.NS.B.4</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>2. Reason abstractly and quantitatively.</li> <li>7. Look for and make use of structure.</li> </ol>	<p><b><u>The Number System:</u></b> Compute fluently with multi-digit numbers and find common factors and multiples.</p>	<p><b><u>Essential Questions:</u></b> What is one way we use multi- digit decimals in our everyday life?</p> <p>When or why would it be useful to know the greatest common/least common factor of a set of numbers?</p> <p><b><u>Learning Targets:</u></b></p> <ul style="list-style-type: none"> <li>- Fluently divide multi-digit numbers</li> <li>- Fluently add, subtract, multiply and divide multi-digit decimals</li> <li>- Find the greatest common factors of two whole numbers (up to 100)</li> <li>- Find the least common multiple of</li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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		two whole numbers (less than or equal to 12)	
<b>Unit 4: Dividing Fractions (11 Days)</b>			
<p><b><u>The Number System</u></b></p> <p><b>Apply and extend previous understandings of multiplication and division to divide fractions by fractions</b></p> <p>Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, create a story context for <math>(2/3) \div (3/4)</math> and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that <math>(2/3) \div (3/4) = 8/9</math> because <math>3/4</math> of <math>8/9</math> is <math>2/3</math>. (In general, <math>(a/b) \div (c/d) = ad/bc</math>.) How much chocolate will each person get if 3 people share <math>1/2</math> lb of chocolate equally? How many <math>3/4</math>-cup servings are in <math>2/3</math> of a cup of yogurt? How wide is a rectangular strip of land with length <math>3/4</math> mi and area <math>1/2</math> square mi? Compute fluently with multi-digit numbers and find common factors and multiples. <b>CC.6.NS.A.1</b></i></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>3. Construct viable arguments and critique the repeated reasoning.</li> <li>8. Look for an express regularity in repeated reasoning.</li> </ol>	<p><b><u>The Number System:</u></b> Apply and extend previous understandings of multiplication and division to divide fractions by fractions</p>	<p><b>Essential Questions:</b></p> <p>How do I explain the meaning of a fraction and its numerator and denominator, and use my understanding to represent and compare fractions?</p> <p>What strategies can be used to solve estimation problems with common and decimal fractions</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Solve word problems involving division of fractions by fractions.</li> <li>- Represent the context of a fraction word problem using a variety of models.</li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<b>Unit 5: Representing Relationships (15 Days)</b>			
<p><b><u>Expressions and Equations</u></b></p> <p><b>Reason about and solve on-variable equations and inequalities</b></p> <p>Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a</p>	<p><b><u>Expressions and Equations: Reason about and solve on-variable equations and inequalities</u></b></p>	<p><b>Essential Questions:</b></p> <p>Why do we use dependent and independent variables to help solve problems?</p>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary</p>

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<p>variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. <b>CC.6.EE.B.6</b></p> <p><b>Represent and analyze quantitative relationships between dependent and independent variables.</b></p> <p>Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation <math>d = 65t</math> to represent the relationship between distance and time. <b>CC.6.EE.C.9</b></p> <p><b><u>Ratios and Proportional Relationships</u></b></p> <p><b>Understand ratio concepts and use ratio reasoning to solve problems</b></p> <p>Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. <b>CC.6.RP.A.3</b></p> <p>Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. <b>CC.6.RP.A.3a</b></p> <p><b><u>The Number System</u></b></p> <p><b>Compute fluently multi-digit numbers and find common factors and multiples</b></p> <p>Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. <b>CC.6.NS.B.3</b></p> <p><b>CCSS for Mathematical Practice</b></p> <p>4. Model with mathematics 8. Look for and express regularity in repeated reasoning.</p>	<p><b>Represent and analyze quantitative relationships between dependent and independent variables.</b></p> <p><b><u>Ratios and Proportional Relationships:</u></b> <b>Understand ratio concepts and use ratio reasoning to solve problems</b></p> <p><b><u>The Number System:</u></b> <b>Compute fluently multi-digit numbers and find common factors and multiples</b></p>	<p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Explain what a variable represents</li> <li>- Use variables to solve problems involving expressions</li> <li>- Use variables to represent the relationship between quantities in real-world problems</li> <li>- Explain the relationship between dependent and independent variables.</li> <li>- Analyze the relationship between dependent and independent variables.</li> <li>- Explain the relationship between rate, ratio and percent.</li> <li>- Fluently add, subtract, multiply and divide multi-digit decimals</li> </ul>	<p>Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
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Unit 6: Extending the Number System (13 Days)			
<p><b><u>The Number System</u></b></p> <p><b>Apply and extend previous understandings of number to the system of rational numbers</b></p> <p>Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. <b>CC.6.NS.C.5</b></p> <p>Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. <b>CC.6.NS.C.6</b></p> <p>Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., <math>-(-3) = 3</math>, and that 0 is its own opposite. <b>CC.6.NS.C.6a</b></p> <p>Understand ordering and absolute value of rational numbers. <b>CC.6.NS.C.7</b></p> <p>Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. <i>For example, interpret <math>-3 &gt; -7</math> as a statement that <math>-3</math> is located to the right of <math>-7</math> on a number line oriented from left to right.</i> <b>CC.6.NS.C.7a</b></p> <p>Write, interpret, and explain statements of order for rational numbers in real-world contexts. <i>For example, write <math>-3^{\circ}\text{C} &gt; -7^{\circ}\text{C}</math> to express the fact that <math>-3^{\circ}\text{C}</math> is warmer than <math>-7^{\circ}\text{C}</math>.</i> <b>CC.6.NS.C.7b</b></p> <p>Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. <i>For example, for an account</i></p>	<p><b><u>The Number System:</u></b></p> <p><b>Apply and extend previous understandings of number to the system of rational numbers</b></p>	<p><b>Essential Questions:</b></p> <p>How can you determine a positive or negative number by using data?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Explain the meaning of positive and negative numbers</li> <li>-Use positive and negative numbers to represent quantities in real-world contexts.</li> <li>-Explain the meaning of 0 in a variety of situations.</li> <li>-Explain the concept of rational numbers</li> <li>-Explain the relationship between the location of a number (on a number line or coordinate plane) and its sign.</li> <li>-Locate and plot rational numbers on a number line (horizontal and vertical) and a coordinate plane.</li> <li>-Explain the concept of absolute value.</li> <li>-Interpret statements of inequality using a number line.</li> <li>-Explain the order and absolute value of rational</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments          Performance Tasks          Rubrics</p>

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<p><i>balance of -30 dollars, write <math> -30  = 30</math> to describe the size of the debt in dollars.</i><b>CC.6.NS.C.7c</b></p> <p>Distinguish comparisons of absolute value from statements about order. <i>For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.</i><b>CC.6.NS.C.7d</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> </ol>		<p>numbers in real-world context.</p>	
<p><b>Unit 7: Relationships in Coordinate Plane (12 Days)</b></p>			
<p><b><u>The Number System</u></b></p> <p><b>Apply and extend previous understandings of numbers to the system of rational numbers</b></p> <p>Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.<b>CC.6.NS.C.6</b></p> <p>Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across<b>CC.6.NS.C.6b</b></p> <p>Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.<b>CC.6.NS.C.6c</b></p>	<p><b><u>The Number System:</u></b> <b>Apply and extend previous understandings of numbers to the system of rational numbers</b></p> <p><b><u>Geometry:</u></b> Solve real world and mathematical problems involving area, surface area and volume.</p>	<p><b>Essential Questions:</b></p> <p>How can plotting points on a coordinate plane help us determine specific locations in real life?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Explain the concept of rational numbers.</li> <li>-Explain the relationship between the location of a number (on a number line or coordinate plane) and its sign.</li> <li>- Locate and plot rational numbers on a number line (horizontal and vertical) and</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments          Performance Tasks          Rubrics</p>

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<p>Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. <b>CC.6.NS.C.8</b></p> <p><b><u>Geometry</u></b></p> <p><b>Solve real world and mathematical problems involving area, surface area and volume.</b></p> <p>Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. <b>CC.6.G.A.3</b></p> <p><b>CCSS for Mathematical Practice</b> 7. Look for and make use of structure.</p>		<p>a coordinate plane.</p> <ul style="list-style-type: none"> <li>-Graph points in all four quadrants of a coordinate plane</li> <li>-Find distances between points using my knowledge of coordinates and absolute value.</li> <li>-Draw polygons in the coordinate plane.</li> <li>-Identify the length of a side using coordinates.</li> <li>- Solve real-world problems involving coordinate planes.</li> </ul>	
<p><b>Unit 8: Algebraic Expressions (12 Days)</b></p>			
<p><b><u>Expressions and Equations</u></b></p> <p><b>Apply and extend previous understandings of arithmetic to algebraic expressions.</b></p> <p>Write and evaluate numerical expressions involving whole-number exponents. <b>CC.6.EE.A.1</b></p> <p>Write, read, and evaluate expressions in which letters stand for numbers. <b>CC.6.EE.A.2</b></p> <p>Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation “Subtract <math>y</math> from 5 as <math>5-y</math>”</i> <b>CC.6.EE.A.2a</b></p> <p>Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. <i>For example, describe the expression <math>2(8 + 7)</math> as a product of two factors; view <math>(8 + 7)</math> as both a single entity and a sum of two terms.</i> <b>CC.6.EE.A.2b</b></p> <p>Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems.</p>	<p><b><u>Expressions and Equations: Apply and extend previous understandings of arithmetic to algebraic expressions.</u></b></p>	<p><b>Essential Questions:</b></p> <p>When are exponents used and why are they important?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Explain the difference between an expression and an equation.</li> <li>-Write numerical expressions involving whole number exponents.</li> <li>-Evaluate numerical expressions involving whole-number exponents.</li> <li>- Translate words into expressions.</li> <li>-Read expressions using</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <ul style="list-style-type: none"> <li>Textbook Tasks</li> <li>Workbook Exercises</li> <li>Math Journal</li> <li>Daily Problem</li> <li>Vocabulary</li> <li>Homework</li> <li>Classwork</li> <li>Participation</li> <li>Learning Maps</li> </ul> <p><b><u>Summative Assessments:</u></b></p> <ul style="list-style-type: none"> <li>Lesson Quizzes</li> <li>Chapter Tests</li> <li>Cumulative Assessments</li> <li>Performance Tasks</li> <li>Rubrics</li> </ul>

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<p>Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas <math>V = s^3</math> and <math>A = 6s^2</math> to find the volume and surface area of a cube with sides of length <math>s = 1/2</math>.</i> <b>CC.6.EE.A.2c</b></p> <p>Apply the properties of operations to generate equivalent expressions. <b>CC.6.EE.A.3</b></p> <p>Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). <i>For example, the expressions <math>y + y + y</math> and <math>3y</math> are equivalent because they name the same number regardless of which number <math>y</math> stands for. Reason about and solve one-variable equations and inequalities.</i> <b>CC.6.EE.A.4</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeating reasoning.</li> </ol>		<p>appropriate mathematical terms.</p> <ul style="list-style-type: none"> <li>-Evaluate expressions using the order of operations.</li> <li>-Use the properties of operations to create equivalent expressions.</li> <li>-Identify equivalent expressions</li> </ul>	
<p><b>Unit 9: Equations and Inequalities (16 Days)</b></p>			
<p><b><u>Expressions and Equations</u></b></p> <p><b>Reason about and solve one-variable equations and inequalities</b></p> <p>Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. <b>CC.6.EE.B.5</b></p> <p>Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. <b>CC.6.EE.B.6</b></p> <p>Solve real-world and mathematical problems by writing and solving equations of the form <math>x + p = q</math> and <math>px = q</math> for cases in which <math>p</math>, <math>q</math> and <math>x</math> are all nonnegative rational numbers. <b>CC.6.EE.B.7</b></p>	<p><b><u>Expressions and Equations: Reason about and solve one-variable equations and inequalities</u></b></p>	<p><b>Essential Questions:</b></p> <p>How can an equation or inequality can be used to represent a given situation?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Explain what an equation and inequality represents.</li> <li>-Determine whether a given number makes an equation or inequality true.</li> <li>-Explain what a variable represents.</li> <li>-Use variables to solve</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments</p>

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<p>Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form <math>x &gt; c</math> or <math>x &lt; c</math> have infinitely many solutions; represent solutions of such inequalities on number line diagrams. <b>CC.6.EE.B.8</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and computationally.</li> <li>7. Look for and make use of structure.</li> </ol>		<p>problems involving expressions.</p> <ul style="list-style-type: none"> <li>-Write equations to represent real-world problems.</li> <li>-Solve one-step equations involving positive numbers. Explain the difference between an equation and an inequality.</li> <li>-Write an inequality to represent a real-world problem.</li> <li>-Identify multiple solutions to an inequality.</li> <li>-Represent solutions of inequalities on a number line.</li> </ul>	<p>Performance Tasks Rubrics</p>
<p><b>Unit 10: Problem Solving with Area of 2 D Shapes (11 Days)</b></p>			
<p><b><u>Geometry</u></b></p> <p><b>Solve real world and mathematical problems involving area, surface area and volume.</b></p> <p>Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. <b>CC.6.G.A.1</b></p> <p><b><u>Expressions and Equations</u></b></p> <p><b>Apply and extend previous understandings of arithmetic to algebraic expressions.</b></p> <p>Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the</i></p>	<p><b>Geometry: Solve real world and mathematical problems involving area, surface area and volume.</b></p> <p><b><u>Expressions and Equations: Apply and extend previous understandings of arithmetic to algebraic expressions.</u></b></p>	<p><b>Essential Questions:</b></p> <p>What is the most appropriate way of communicating a mathematical idea in a particular situation?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Find the area of polygons by composing or decomposing them into basic shapes.</li> <li>-Apply my understanding of shapes to solve real-world problems.</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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<p><i>formulas <math>V = s^3</math> and <math>A = 6s^2</math> to find the volume and surface area of a cube with sides of length <math>s = 1/2</math>.</i> <b>CC.6.EE.A.2c</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>4. Model with mathematics.</li> <li>6. Attend to precision.</li> </ol>		<ul style="list-style-type: none"> <li>-Translate words into expressions.</li> <li>-Read expressions using appropriate mathematical terms.</li> <li>- Evaluate expressions using the order of operations.</li> </ul>	
<p><b>Unit 11: Problem Solving with Volume and Surface Area (11 Days)</b></p>			
<p><b><u>Geometry</u></b></p> <p><b>Solve real world and mathematical problems involving area, surface area and volume.</b></p> <p>Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas <math>V = lwh</math> and <math>V = bh</math> to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. <b>CC.6.G.A.2</b></p> <p>Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. <b>CC.6.G.A.4</b></p> <p><b><u>Expressions and Equations</u></b></p> <p><b>Apply and extend previous understandings of arithmetic to algebraic expressions.</b></p> <p>Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas <math>V = s^3</math> and <math>A = 6s^2</math> to find the volume and surface area of a cube with sides of length <math>s = 1/2</math>.</i> <b>CC.6.EE.A.2c</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>5. Use appropriate tools strategically.</li> </ol>	<p><b><u>Geometry: Solve real world and mathematical problems involving area, surface area and volume.</u></b></p> <p><b><u>Expressions and Equations: Apply and extend previous understandings of arithmetic to algebraic expressions.</u></b></p>	<p><b><u>Essential Questions:</u></b></p> <p>What is volume and how does it relate to the attribute of an individual figure?</p> <p><b><u>Learning Targets:</u></b></p> <ul style="list-style-type: none"> <li>-Explain the volume formula of a rectangular prism using unit cubes.</li> <li>-Find the volume of a rectangular prism using formulas.</li> <li>-Solve real-world problems involving volume.</li> <li>-Represent three-dimensional shapes using nets.</li> <li>-Find the surface area of three dimensional shapes (using nets).</li> <li>-Solve for surface area in real-world problems involving three- dimensional shapes.</li> <li>-Evaluate expressions using</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments          Performance Tasks          Rubrics</p>

Attachment 4: Math Scope and Sequence, 6<sup>th</sup> Grade

<p>6. Attend to precision. 7. Look for and make use of structure.</p>		<p>the order of operations.</p>	
<p><b>Unit 12: Data (9 Days)</b></p>			
<p><b>Statistics and Probability</b></p> <p><b>Develop understanding of statistical variability.</b></p> <p>Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.</i><b>CC.6.SP.A.1</b></p> <p>Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.<b>CC.6.SP.A.2</b></p> <p>Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.<b>CC.6.SP.A.3</b></p> <p><b>CCSS for Mathematical Practice</b></p> <ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>4. Model with mathematics.</li> </ol>	<p><b>Statistics and Probability: Develop understanding of statistical variability.</b></p>	<p><b>Essential Questions:</b></p> <p>In what ways can sets of data be represented by statistical measures?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Identify statistical questions</li> <li>-Explain how data answers statistical questions</li> <li>-Describe a statistical data set using center, spread and shape.</li> <li>-Compare a measure of center with a measure of variation.</li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 13: Analyzing Data (13 Days)</b></p>			
<p><b>Statistics and Probability</b></p> <p><b>Summarize and describe distributions</b></p> <p>4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.<b>CC.6.SP.B.4</b></p> <p>Summarize numerical data sets in relation to their context, such as by:<b>CC.6.SP.B.5</b></p> <p>Reporting the number of observations.<b>CC.6.SP.B.5a</b></p> <p>Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.<b>CC.6.SP.B.5b</b></p>	<p><b>Statistics and Probability: Summarize and describe distributions</b></p>	<p><b>Essential Questions:</b></p> <p>How can you collect, organize, and display data?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Communicate numerical data on a number line (dot plots, histograms, and box plots).</li> <li>-Summarize numerical data sets.</li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes Chapter Tests</p>

Attachment 4: Math Scope and Sequence, 6<sup>th</sup> Grade

<p>Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. <b>CC.6.SP.B.5c</b></p> <p>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. <b>CC.6.SP.B.5d</b></p> <p><b>CCSS for Mathematical Practice</b></p> <p>3. Construct viable arguments and critique the reasoning of others.</p> <p>5. Use appropriate tools strategically</p> <p>6. Attend to precision.</p> <p>8. Look for and express regularity in repeated reasoning.</p>		<p>-Analyze the relationship between measures of center and the data distribution.</p>	<p>Cumulative Assessments Performance Tasks Rubrics</p>



Attachment 4: Math Scope and Sequence, 7<sup>th</sup> Grade

<p><b>and equations.</b></p> <p>Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. <b>CC.7.EE.4</b></p> <p>Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i> <b>CC.7.EE.4a</b></p> <p><b>Geometry</b></p> <p><b>Draw construct, and describe geometrical figures and describe the relationships between them.</b></p> <p>Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. <b>CC.7.G.A.1</b></p>			
<p><b>Unit 2: Proportional Relationships (12 Days)</b></p>			
<p><b><u>Ratios and Proportional Relationships</u></b></p> <p><b>Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p> <p>Recognize and represent proportional relationships between quantities. <b>CC.7.RP.A.2</b></p> <p>Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. <b>CC.7.RP.A.2a</b></p> <p>Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal</p>	<p><b><u>Ratios and Proportional Relationships:</u> Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p>	<p><b>Essential Questions:</b></p> <p><b>How are tables of equivalent ratios, graphs and equations related to one another?</b></p> <p><b>How do they allow us to make predictions and solve problems?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Recognize, represent, and explain proportions using tables, graphs, equations, diagrams and verbal descriptions.</b></li> <li>- <b>Compute unit rates</b></li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes          Chapter Tests</p>

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<p>descriptions of proportional relationships. <b>CC.7.RP.A.2b</b></p> <p>Represent proportional relationships by equations. <i>For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</i> <b>CC.7.RP.A.2c</b></p> <p>Explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of the situation, with special attention to the points <math>(0, 0)</math> and <math>(1, r)</math> where <math>r</math> is the unit rate. <b>CC.7.RP.A.2d</b></p>		<ul style="list-style-type: none"> <li>- <b>Determine whether two quantities represent a proportional relationship</b></li> <li>- <b>Transfer understanding of unit rates to multiple real-world problems</b></li> </ul>	<p>Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 3: Proportional Reasoning with Percentages (10 Days)</b></p>			
<p><b><u>Ratios and Proportional Relationships</u></b></p> <p><b>Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p> <p>Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i> <b>CC.7.RP.A.3</b></p> <p><b><u>Expressions and Equations</u></b></p> <p><b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations</b></p> <p>Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies <b>CC.7.EE.B.3</b></p>	<p><b><u>Ratios and Proportional Relationships: Analyze proportional relationships and use them to solve real-world and mathematical problems.</u></b></p> <p><b><u>Expressions and Equations: Solve real-life and mathematical problems using numerical and algebraic expressions and equations</u></b></p>	<p><b>Essential Questions:</b></p> <p><b>What are some real- word scenarios where you would encounter taxes, commissions and gratuities?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Solve multi-step and percent problems which include: simple interest, taxes, mark-ups, gratuities and commissions, fees, percent increase and decrease and percent error.</li> <li>-Use properties of operations to analyze and solve problems with rational numbers in any form (whole numbers, fractions and decimals)</li> <li>- Convert between whole numbers, fractions and decimals.</li> <li>- Use mental math to estimate and compute to determine whether an answer makes sense.</li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 4: Rational number operations;</b></p>			

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<p><b>addition and subtraction (12 Days)</b></p>			
<p><b><u>The Number System</u></b></p> <p><b>Apply and extend previous understandings of operations with fractions.</b></p> <p>Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.. <b>CC.7.NS.A.1</b></p> <p>Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</i> <b>CC.7.NS.A.1a</b></p> <p>Understand <math>p + q</math> as the number located a distance <math> q </math> from <math>p</math>, in the positive or negative direction depending on whether <math>q</math> is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. <b>CC.7.NS.A.1b</b></p> <p>Understand subtraction of rational numbers as adding the additive inverse, <math>p - q = p + (-q)</math>. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. <b>CC.7.NS.A.1c</b></p> <p>Apply properties of operations as strategies to add and subtract rational numbers. <b>CC.7.NS.A.1d</b></p> <p>Solve real-world and mathematical problems involving the four operations with rational numbers <b>CC.7.NS.A.3</b></p> <p><b><u>Expressions and Equations</u></b></p> <p><b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any</p>	<p><b><u>The Number System:</u></b> <b>Apply and extend previous understandings of operations with fractions.</b></p> <p><b><u>Expressions and Equations:</u></b> <b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p>	<p><b>Essential Questions:</b></p> <p>How can multiple math operations be used to solve real world problems?</p> <p>How do you use the commutative, associative and distributive properties to simplify expressions?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Add and subtract rational numbers</b></li> <li>- <b>Represent addition and subtraction on horizontal and vertical number lines.</b></li> <li>- <b>Subtract a rational number by adding its opposite (additive inverse).</b></li> <li>- <b>Use the absolute values of numbers on a number line to illustrate both addition and subtraction.</b></li> <li>- <b>Apply properties of operations (commutative, associative and distributive) to add and subtract rational numbers.</b></li> <li>- <b>Use the four operations to solve problems involving rational numbers.</b></li> <li>- <b>Use properties of operations to analyze and solve problems with rational numbers in any</b></li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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<p>form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <b>CC.7.EE.B.3</b></p>		<p><b>form (whole numbers, fractions and decimals).</b></p> <ul style="list-style-type: none"> <li>- <b>Convert between whole numbers, fractions and decimals.</b></li> <li>- <b>Use mental math to estimate and compute to determine whether an answer makes sense.</b></li> </ul>	
<p><b>Unit 5: Rational Number Operations; multiplication and division (9 Days)</b></p>			
<p><b><u>The Number System</u></b></p> <p><b>Apply and extend previous understandings of operations with fractions</b></p> <p>Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. <b>CC.7.NS.A.2</b></p> <p>Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as <math>(-1)(-1) = 1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. <b>CC.7.NS.A.2a</b></p> <p>Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If <math>p</math> and <math>q</math> are integers, then <math>-(p/q) = (-p)/q = p/(-q)</math>. Interpret quotients of rational numbers by describing real-world contexts <b>CC.7.NS.A.2b</b></p> <p>Apply properties of operations as strategies to multiply and divide rational numbers. <b>CC.7.NS.A.2c</b></p> <p>Solve real-world and mathematical problems involving the four operations with rational numbers <b>CC.7.NS.A.3</b></p> <p><b><u>Expressions and Equations</u></b></p>	<p><b><u>The Number System:</u></b> <b>Apply and extend previous understandings of operations with fractions</b></p> <p><b><u>Expressions and Equations:</u></b> <b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p>	<p><b>Essential Questions:</b></p> <p>How do I evaluate rational numbers using various operations?</p> <p>How would life be different without knowledge of fractions and decimals?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Multiply and divide rational numbers</b></li> <li>- <b>Apply the commutative, associative and distributive properties appropriately in multiplying and dividing rational numbers.</b></li> <li>- <b>Convert a fraction to a decimal using long division.</b></li> <li>- <b>Explain the difference between a rational and an irrational number.</b></li> <li>- <b>Use the four operations to solve problems involving</b></li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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<p><b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <b>CC.7.EE.B.3</b></p>		<p><b>rational numbers.</b></p> <ul style="list-style-type: none"> <li>- Use properties of operations to analyze and solve problems with rational numbers in any form (whole numbers, fractions and decimals).</li> <li>- Convert between whole numbers, fractions and decimals.</li> <li>- Use mental math to estimate and compute to determine whether an answer makes sense.</li> </ul>	
<p><b>Unit 6: Solving Equations (13 Days)</b></p>			
<p><u><b>Expressions and Equations</b></u></p> <p><b>Use properties of operations to generate equivalent expressions.</b></p> <p>Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. <b>CC.7.EE.A.1</b></p> <p>Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, <math>a + 0.05a = 1.05a</math> means that “increase by 5%” is the same as “multiply by 1.05.”</i> <b>CC.7.EE.A.2</b></p> <p><b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. <b>CC.7.EE.B.4</b></p> <p>Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific</p>	<p><u><b>Expressions and Equations:</b></u></p> <p><b>Use properties of operations to generate equivalent expressions.</b></p> <p><b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p>	<p><b>Essential Questions:</b></p> <p>How can the properties of operations be written, solved, and understood in our everyday lives?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>-Use the properties of operations to solve linear expressions with rational coefficients.</li> <li>- Rewrite an expression in different forms to help me understand and solve problems.</li> <li>-I can write, solve, and interpret two-step equations using known and unknown values.</li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments          Performance Tasks          Rubrics</p>

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<p>rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i> <b>CC.7.EE.B.4a</b></p>			
<p><b>Unit 7: Solving Equations and Inequalities (11 Days)</b></p>			
<p><b><u>Expressions and Equations</u></b></p> <p><b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. <b>CC.7.EE.B.4</b></p> <p>Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i><b>CC.7.EE.B.4a</b></p> <p><i>Solve word problems leading to inequalities of the form <math>px + q &gt; r</math> or <math>px + q &lt; r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions</i><b>CC.7.EE.B.4b</b></p>	<p><b><u>Expressions and Equations:</u></b> <b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p>	<p><b><u>Essential Questions:</u></b></p> <p>How are the properties of real numbers useful when solving equations or inequalities</p> <p><b><u>Learning Targets:</u></b></p> <ul style="list-style-type: none"> <li>- <b>I can write, solve, and interpret two-step equations using known and unknown values.</b></li> <li>- <b>I can write, solve, and interpret two-step inequalities using known and unknown values.</b></li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 8: Probability of Simple Events (12 Days)</b></p>			
<p><b><u>Statistics and Probability</u></b></p> <p><b>Investigate chance processes and develop, use, and evaluate probability models.</b></p> <p>Understand that the probability of a chance event is a</p>	<p><b><u>Statistics and Probability:</u></b> <b>Investigate chance processes and develop, use, and evaluate probability models.</b></p>	<p><b><u>Essential Questions:</u></b> How is the probability of an event determined and described?</p>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem</p>

## Attachment 4: Math Scope and Sequence, 7<sup>th</sup> Grade

<p>number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. <b>CC.7.SP.C.5</b></p> <p>Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. <i>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i> <b>CC.7.SP.C.6</b></p> <p>Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. <b>CC.7.SP.C.7</b></p> <p>Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected</i> <b>CC.7.SP.C.7a</b></p> <p>Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</i> <b>CC.7.SP.C.7b</b></p> <p><b><u>Ratios and Proportional Relationships</u></b></p> <p><b>Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p> <p>Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent</i></p>	<p><b><u>Ratios and Proportional Relationships: Analyze proportional relationships and use them to solve real-world and mathematical problems.</u></b></p>	<p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Explain why the numeric probability of an event must be between 0 and 1.</b></li> <li>- <b>Explain the likeliness of an event occurring based on probability.</b></li> <li>- <b>Determine the probability for a single event by collecting an analyzing frequency in a chance process.</b></li> <li>- <b>Explain the difference between experimental and theoretical probability.</b></li> <li>- <b>Compare and contrast probability models and explain discrepancies using those probability models.</b></li> </ul>	<p>Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
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<p><i>increase and decrease, percent error.</i><b>CC.7.RP.3</b></p>			
<p><b>Unit 9: Probability of Compound Events (11 Days)</b></p>			
<p><b><u>Statistics and Probability</u></b></p> <p><b>Investigate chance processes and develop, use, and evaluate probability models.</b></p> <p>Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. <b>CC.7.SP.C.8</b></p> <p>Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. <b>CC.7.SP.C.8a</b></p> <p>Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. <b>CC.7.SP.C.8b</b></p> <p>Design and use a simulation to generate frequencies for compound events. <i>For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</i><b>CC.7.SP.C.8c</b></p> <p><b><u>Ratios and Proportional Relationships</u></b></p> <p><b>Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p> <p>Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i><b>CC.7.RP.3</b></p>	<p><b><u>Statistics and Probability:</u></b> <b>Investigate chance processes and develop, use, and evaluate probability models.</b></p> <p><b><u>Ratios and Proportional Relationships:</u></b> <b>Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p>	<p><b>Essential Questions:</b></p> <p>How do charts, tables, and graphs help you interpret data?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Design and investigate a simulation that will allow me to collect data to generate frequencies for compound events using sample spaces, organized lists, tables and tree diagrams.</b></li> <li>- <b>Solve the following types of multi-step and percent problems: simple interest, taxes, markups, gratuities and commissions, fees, percent increase and decrease and percent error.</b></li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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<p><b>Unit 10: Sampling, Inferences and Comparing Populations (12 Days)</b></p>			
<p><b><u>Statistics and Probability</u></b></p> <p><b>Use random sampling to draw inferences about a population.</b></p> <p>Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. <b>CC.7.SP.A.1</b></p> <p>Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i> <b>CC.7.SP.A.2</b></p> <p><b>Draw informal comparative inferences about two populations</b></p> <p>Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i> <b>CC.7.SP.B.3</b></p> <p>Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i> <b>CC.7.SP.B.4</b></p>	<p><b><u>Statistics and Probability:</u></b></p> <p><b>Use random sampling to draw inferences about a population.</b></p> <p><b>Draw informal comparative inferences about two populations</b></p>	<p><b>Essential Questions:</b></p> <p>In what ways can sets of data be represented by statistical measures?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Determine whether generalizations are valid by examining sample size and sampling methods.</b></li> <li>- <b>Use data from a random sample to draw conclusions and make reasonable arguments about a population.</b></li> <li>- <b>Describe sample size and sampling methods that will allow me to make more accurate conclusions and arguments.</b></li> <li>- <b>Compare and draw informal inferences about two populations using measure of center (median, mean) and measures of variations (range), visual overlap and mean absolute deviation.</b></li> <li>- <b>Compare the degree of visual overlap of the data plots from two different populations.</b></li> </ul>	<p><b><u>Formative Assessments:</u></b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b><u>Summative Assessments:</u></b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments          Performance Tasks          Rubrics</p>

Attachment 4: Math Scope and Sequence, 7<sup>th</sup> Grade

		<ul style="list-style-type: none"> <li>- Explain what the different between the two data plots means.</li> <li>- Use measures of center and measures of variability to draw informal inferences about two populations.</li> </ul>	
<b>Unit 11: 2-D Figures (12 Days)</b>			
<p><b>Geometry</b></p> <p><b>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p> <p><i>Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</i> <b>CC.7.G.B.4</b></p> <p><i>Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms</i> <b>CC.7.G.B.6</b></p>	<p><b>Geometry: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p>	<p><b>Essential Questions:</b>            What is the relationship between the circumference and area of a circle?            How do you find the circumferences of a two dimensional object?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Know the formulas for the area and circumference of a circle.</li> <li>- Use circle formulas to solve problems.</li> <li>- Explain the relationship between the circumference and area of a circle.</li> <li>- Solve real-world and mathematical problems involving 2-dimensional area (triangles, quadrilaterals, polygons).</li> </ul>	<p><b>Formative Assessments:</b>            Textbook Tasks            Workbook Exercises            Math Journal            Daily Problem            Vocabulary            Homework            Classwork            Participation            Learning Maps</p> <p><b>Summative Assessments:</b>            Lesson Quizzes            Chapter Tests            Cumulative Assessments            Performance Tasks            Rubrics</p>
<b>Unit 12: 3-D Figures (12 Days)</b>			
<p><b>Geometry</b></p> <p><b>Draw, construct, and describe geometrical figures and describe the relationships between them.</b></p>	<p><b>Geometry</b></p> <p><b>Draw, construct, and describe geometrical figures and describe the</b></p>	<p><b>Essential Questions:</b>            How can objects be represented and compared using geometric</p>	<p><b>Formative Assessments:</b>            Textbook Tasks            Workbook Exercises            Math Journal            Daily Problem</p>

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<p><i>Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. CC.7.G.A.3</i></p> <p><b>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p> <p><i>Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms CC.7.G.B.6</i></p>	<p><b>relationships between them.</b></p> <p><b>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p>	<p>attributes?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Describe the two-dimensional figures that result from slicing three-dimensional figures.</li> <li>- Solve real-world and mathematical problems involving 3-dimensional volume and surface area (cubes, right prisms).</li> </ul>	<p>Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 13: Scale Drawings (12 Days)</b></p>			
<p><u>Geometry</u></p> <p><b>Draw, construct and describe geometrical figures and describe the relationship between them.</b></p> <p>Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. <b>CC.7.G.A.1</b></p>	<p><b>Geometry: Draw, construct and describe geometrical figures and describe the relationship between them.</b></p>	<p><b>Essential Questions:</b> How does changing dimensions affect the perimeter, circumference, and area of common geometric figures?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Solve problems with scale drawings of geometric figures</li> <li>- Compute actual lengths and area from a scale drawing.</li> <li>- Reproduce a scale drawing using a different scale.</li> </ul>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 14: Geometric Constructions (11 Days)</b></p>			
<p><u>Geometry</u></p> <p><b>Draw, construct, and describe geometrical</b></p>	<p><b>Geometry: Draw, construct, and describe geometrical figures and</b></p>	<p><b>Essential Questions:</b> <b>How can you tell if an angle is</b></p>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises</p>

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<p><b>figures and describe the relationships between them.</b></p> <p><i>Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</i> <b>CC.7.G.A.2</b></p> <p><b>Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</b></p> <p><i>Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</i> <b>CC.7.G.B.5</b></p>	<p><b>describe the relationships between them. Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</b></p>	<p><b>supplementary, complementary, vertical, or adjacent? What tools would you use to do so?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Draw (freehand, with ruler and protractor, with technology) geometric shapes with given conditions.</b></li> <li>- <b>Construct triangles from three measures of angles or sides.</b></li> <li>- <b>Notice when the given conditions determine a unique triangle, more than one triangle or no triangle.</b></li> <li>- <b>Use facts about supplementary, complementary, vertical and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</b></li> </ul>	<p>Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
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## ***Curriculum Scope & Sequence***

**School: Pike Creek Charter Middle School Grade or Course: 8<sup>th</sup> Grade Math Teacher \_\_\_\_\_**

<b>Learning Targets</b>  Content Standards, Grade Level Expectations, Proficiency Level Expectations, or Grade Cluster Benchmarks	<b>Theme/Big Idea/Concept</b>	<b>Enduring Understandings and/or Essential Questions</b>	<b>Assessments</b>
<b>Unit 1: Introducing Transformations (10 Days)</b>			
<p><b>Geometry</b></p> <p><b>Understand congruence and similarity using physical models, transparencies, or geometry software.</b></p> <p>Verify experimentally the properties of rotations, reflections, and translations. <b>CC.8.G.A.1</b></p> <p>Lines are taken to lines, and line segments to line segments of the same length. <b>CC.8.G.A.1a</b></p> <p>Angles are taken to angles of the same measure. <b>CC.8.G.A.1b</b></p> <p>Parallel lines are taken to parallel lines. <b>CC.8.G.A.1c</b></p>	<p><b>Geometry: Understand congruence and similarity using physical models, transparencies, or geometry software.</b></p>	<p><b>Essential Questions:</b>  <b>How can you apply the properties and reflections of lines and angles?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Describe and apply the properties of translations, rotations, and reflections of lines, line segments, angles, parallel lines and geometric figures.</b></li> </ul>	<p><b><u>Formative Assessments:</u></b>                      Textbook Tasks                      Workbook Exercises                      Math Journal                      Daily Problem                      Vocabulary                      Homework                      Classwork                      Participation                      Learning Maps</p> <p><b><u>Summative Assessments:</u></b>                      Lesson Quizzes                      Chapter Tests                      Cumulative Assessments                      Performance Tasks                      Rubrics</p>

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<p><b>Unit 2: Understanding Congruence through Transformations (11 Days)</b></p>			
<p><b>Geometry</b></p> <p><b>Understand congruence and similarity using physical models, transparencies or geometry software.</b></p> <p>Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. <b>CC.8.G.A.2</b></p> <p>Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. <b>CC.8.G.A.3</b></p>	<p><b>Geometry: Understand congruence and similarity using physical models, transparencies or geometry software.</b></p>	<p><b>Essential Questions:</b> How do you describe and apply a two dimensional figure on a coordinate plane?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Describe how two figures are congruent if the first figure can be rotated, reflected, and/or translated to create the second figure.</li> <li>- Given two congruent figures, describe the transformations needed to create the second from the first.</li> <li>- Describe and apply dilation, translation, rotation, and reflection to two-dimensional figures in a coordinate plane.</li> </ul>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 3: Understanding Similarity (13 Days)</b></p>			
<p><b>Geometry</b></p> <p><b>Understand congruence and similarity using physical models, transparencies or geometry software.</b></p> <p>Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. <b>CC.8.G.A.3</b></p> <p>Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-</p>	<p><b>Geometry: Understand congruence and similarity using physical models, transparencies or geometry software.</b></p>	<p><b>Essential Questions:</b> How can you rotate, reflect, dilate, and translate a figure/ What is the angle sum theorem?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Describe and apply dilation, translation, rotation and reflection to two-dimensional figures in a coordinate plane.</li> <li>- Describe how two figures are similar if the first</li> </ul>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b></p>

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<p>dimensional figures, describe a sequence that exhibits the similarity between them.<b>CC.8.G.A.4</b></p> <p>Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.<b>CC.8.G.A.5</b></p>		<p><b>figure can be rotated, reflected, dilated and/or translated to create the second figure.</b></p> <ul style="list-style-type: none"> <li>- <b>Given two similar figures, describe the transformations needed to create the second from the first.</b></li> <li>- <b>Informally prove the angle-sum theorem.</b></li> <li>- <b>Informally prove the properties fo angles when parallel lines are cut by a transversal.</b></li> <li>- <b>Informally prove the angle-angle criterion for similar triangles.</b></li> </ul>	<p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 4: Rational and Irrational Numbers (7 Days)</b></p>			
<p><b><u>The Number System</u></b></p> <p><b>Know that there are numbers that are not rational and approximate them by rational numbers</b></p> <p>Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.<b>CC.8.NS.A.1</b></p> <p>Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., <math>\sqrt{2}</math>). <i>For example, by truncating the decimal expansion of <math>\sqrt{2}</math>, show that <math>\sqrt{2}</math> is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.</i> <b>CC.8.NS.A.2</b></p> <p><b><u>Expressions and Equations</u></b></p>	<p><b><u>The Number System:</u></b> <b>Know that there are numbers that are not rational and approximate them by rational numbers</b></p> <p><b><u>Expressions and Equations:</u></b> <b>Work with radicals and integer exponents.</b></p>	<p><b>Essential Questions:</b></p> <p><b>How would you analyze and interpret a rational and irrational number?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Identify whether a number is rational or irrational by whether its decimal form is exact, repeating, or does not repeat.</b></li> <li>- <b>Convert repeating decimal numbers into their fraction equivalents.</b></li> <li>- <b>Estimate rational and irrational numbers in order to compare their relative size and location</b></li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>

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<p><b>Work with radicals and integer exponents.</b></p> <p>Use square root and cube root symbols to represent solutions to equations of the form <math>x^2 = p</math> and <math>x^3 = p</math>, where <math>p</math> is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that <math>\sqrt{2}</math> is irrational. <b>CC.8.EE.A.2</b></p>		<p><b>on a number line.</b></p> <ul style="list-style-type: none"> <li>- <b>Solve one-step equations requiring square or cube roots and determine when the solution is rational or irrational.</b></li> <li>- <b>Evaluate square roots of small perfect squares and cube roots of small perfect cubes.</b></li> <li>- <b>Explain why <math>\sqrt{2}</math> is irrational.</b></li> </ul>	
<b>Unit 5: Pythagorean Theorem (13 Days)</b>			
<p><b>Geometry</b></p> <p><b>Understand and apply the Pythagorean Theorem</b></p> <p>Explain a proof of the Pythagorean Theorem and its converse. <b>CC.8.G.B.6</b></p> <p>Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. <b>CC.8.G.B.7</b></p> <p>Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. <b>CC.8.G.B.8</b></p>	<p><b>Geometry: Understand and apply the Pythagorean Theorem</b></p>	<p><b>Essential Questions:</b></p> <p><b>What is the Pythagorean Theorem?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Describe a proof of the Pythagorean Theorem and its converse.</b></li> <li>- <b>Determine the unknown side lengths in a right triangle problem using the Pythagorean Theorem.</b></li> <li>- <b>Determine the distance between two points in a coordinate plane using the Pythagorean Theorem.</b></li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<b>Unit 6: Functions ( 8 Days)</b>			
<p><b>Functions</b></p> <p><b>Define, evaluate and compare functions</b></p> <p>Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the</p>	<p><b>Functions: Define, evaluate and compare functions</b></p> <p><b>Use functions to model relationships between</b></p>	<p><b>Essential Questions:</b></p> <p><b>How can you tell if a function is linear or nonlinear?</b></p> <p><b>Learning Targets:</b></p>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary</p>

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<p>corresponding output.<b>CC.8.F.A.1</b></p> <p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.</i></p> <p><b>CC.8.F.A.2</b></p> <p>Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function <math>A = s^2</math> giving the area of a square as a function of its side length is not linear because its graph contains the points <math>(1, 1)</math>, <math>(2, 4)</math> and <math>(3, 9)</math>, which are not on a straight line.</i><b>CC.8.F.A.3</b></p> <p><b>Use functions to model relationships between quantities.</b></p> <p>Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.<b>CC.8.F.B.5</b></p>	<p><b>quantities.</b></p>	<ul style="list-style-type: none"> <li>- <b>Determine if a relation is a function using a table, graph, or set of ordered pairs.</b></li> <li>- <b>Compare and contrast multiple representations of (tables, graphs, equations and verbal models) of two functions</b></li> <li>- <b>Determine whether the relationship is a function</b></li> <li>- <b>Identify the rate of change and y-intercept for a linear function.</b></li> <li>- <b>Determine if a function is linear or nonlinear from a table, equation, graph or verbal model.</b></li> <li>- <b>Describe the relationship between two quantities when given a graph</b></li> <li>- <b>Sketch a graph from a verbal description of a function.</b></li> </ul>	<p>Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 7: Introduction to Linearity (11 Days)</b></p>			
<p><b><u>Expressions and Equations</u></b></p> <p><b>Understand the connections between proportional relationships, lines and linear equations.</b></p> <p>Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. <i>For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.</i><b>CC.8.EE.B.5</b></p> <p>Use similar triangles to explain why the slope <math>m</math> is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the</p>	<p><b><u>Expressions and Equations:</u> Understand the connections between proportional relationships, lines and linear equations.</b></p> <p><b><u>Functions:</u> Use functions to model relationships between quantities.</b></p>	<p><b>Essential Questions:</b> <b>What is a proportional relationship?</b> <b>What is the equation to determine slope- intercept?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Compare, contrast, and interpret multiple representations of proportional relationships (graphs, tables, equations, and verbal models).</b></li> <li>- <b>Graph proportional</b></li> </ul>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes Chapter Tests</p>

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<p>equation <math>y = mx</math> for a line through the origin and the equation <math>y = mx + b</math> for a line intercepting the vertical axis at <math>b</math>. <b>CC.8.EE.B.6</b></p> <p><b><u>Functions</u></b></p> <p><b>Use functions to model relationships between quantities.</b></p> <p>Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two <math>(x, y)</math> values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. <b>CC.8.F.B.4</b></p> <p>Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. <b>CC.8.F.B.5</b></p>		<p><b>relationships by using unit rate as the slope of the graph.</b></p> <ul style="list-style-type: none"> <li>- <b>Compare and contrast two different proportional relationships that are represented in different ways, i.e. an equation with a graph.</b></li> <li>- <b>Write and interpret an equation for a line in slope-intercept form and determine the relationship is linear using similar triangles to show the slope is the same between any two points.</b></li> <li>- <b>Write, graph and interpret linear functions</b></li> <li>- <b>Construct a function to model a linear relationship form a table of values, two points or verbal description.</b></li> <li>- <b>Determine the rate of change(slope_ and initial value (y-intercept) from a table and graph.</b></li> <li>- <b>Explain the meaning of the rate of change and initial value of a linear function in terms of the situation it models.</b></li> <li>- <b>Describe the relationship between two quantities when given a graph.</b></li> <li>- <b>Sketch a graph from a verbal description of a function.</b></li> </ul>	<p>Cumulative Assessments Performance Tasks Rubrics</p>
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<b>Unit 8: Patterns of Association in Bivariate Data (15 Days)</b>			
<p><b>Statistics and Probability</b></p> <p><b>Investigate patterns of association in bivariate data.</b></p> <p>Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.<b>CC.8.SP.A.1</b></p> <p>Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.<b>CC.8.SP.A.2</b></p> <p>Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. <i>For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.</i><b>CC.8.SP.A.3</b></p> <p>Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.<b>CC.8.SP.A.4</b></p>	<p><b>Statistics and Probability:</b>  <b>Investigate patterns of association in bivariate data.</b></p>	<p><b>Essential Questions:</b></p> <p><b>How can you use data to predict an event?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Construct and interpret scatter plots.</b></li> <li>- <b>Describe the relationships shown in a scatter plot by identifying patterns such as clustering, outliers, positive or negative association, linear and nonlinear association.</b></li> <li>- <b>Sketch a line of best fit on a scatter plot, justify the location of the line; and explain why or why not a given line is a good fit.</b></li> <li>- <b>Write the equation of a line of best fit and use it to make predictions</b></li> <li>- <b>Use the slope and y-intercept to describe the relationship represented in a data set.</b></li> <li>- <b>Construct two-way frequency and relative frequency tables to summarize categorical data.</b></li> <li>- <b>Use relative frequencies to</b></li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks          Workbook Exercises          Math Journal          Daily Problem          Vocabulary          Homework          Classwork          Participation          Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes          Chapter Tests          Cumulative Assessments          Performance Tasks          Rubrics</p>

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		describe the possible association between two variables of categorical data.	
<b>Unit 9: Nonlinear Functions (10 Days)</b>			
<p><b>Functions</b></p> <p><b>Define, evaluate, and compare functions.</b></p> <p>Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function <math>A = s^2</math> giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.</i> <b>CC.8.F.A.3</b></p> <p><b>Use functions to model relationships between quantities</b></p> <p>Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. <b>CC.8.F.B.5</b></p>	<p><b>Functions: Define, evaluate, and compare functions.</b></p> <p><b>Use functions to model relationships between quantities</b></p>	<p><b>Essential Questions:</b> What are the necessary steps to create a graph and how can you interpret the data?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Determine if a function is linear or nonlinear from a table, equation, graph, or verbal model.</li> <li>- Describe the relationship between two quantities when give a graph.</li> <li>- Sketch a graph from a verbal description of a function.</li> </ul>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<b>Unit 10: Solving Linear Equations ( 11 Days)</b>			
<p><b>Expressions and Equations</b></p> <p><b>Analyze and solve linear equations and pairs of simultaneous linear equations.</b></p> <p>Solve linear equations in one variable. <b>CC.8.EE.C.7</b></p> <p>Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form <math>x = a</math>, <math>a = a</math>, or <math>a = b</math> results (where <math>a</math> and <math>b</math> are different numbers). <b>CC.8.EE.C.7a</b></p> <p>Solve linear equations with rational number coefficients, including equations whose solutions require expanding</p>	<p><b>Expressions and Equations: Analyze and solve linear equations and pairs of simultaneous linear equations.</b></p>	<p><b>Essential Questions:</b> How do you manipulate equations?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- Write, solve, and interpret the solution set of multi-step linear equations in one variable.</li> <li>- Determine when a solution gives one solution, infinitely many solutions, or no solutions.</li> <li>- Apply the distributive</li> </ul>	<p><b>Formative Assessments:</b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b> Lesson Quizzes</p>

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expressions using the distributive property and collecting like terms. <b>CC.8.EE.C.7b</b>		<p><b>property to algebraic expressions.</b></p> <ul style="list-style-type: none"> <li>- <b>Combine like terms to simplify expressions and equations.</b></li> </ul>	Chapter Tests Cumulative Assessments Performance Tasks Rubrics
<b>Unit 11: Systems of Linear Equations (17 Days)</b>			
<p><b>Expressions and Equations</b></p> <p><b>Analyze and solve linear equations and pairs of simultaneous linear equations.</b></p> <p>Analyze and solve pairs of simultaneous linear equations. <b>CC.8.EE.C.8</b></p> <p>Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. <b>CC.8.EE.C.8a</b></p> <p>Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. <i>For example, <math>3x + 2y = 5</math> and <math>3x + 2y = 6</math> have no solution because <math>3x + 2y</math> cannot simultaneously be 5 and 6.</i> <b>CC.8.EE.C.8b</b></p> <p>Solve real-world and mathematical problems leading to two linear equations in two variables. <i>For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.</i> <b>CC.8.EE.C.8c</b></p>	<p><b>Expressions and Equations: Analyze and solve linear equations and pairs of simultaneous linear equations.</b></p>	<p><b>Essential Questions:</b></p> <p><b>How do we understand and represent linear relationships</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Write, solve, and interpret the solutions to systems of linear equations with two variables graphically and algebraically.</b></li> <li>- <b>Recognize and explain the solution to a system of linear equations graphically (as a point of intersection)</b></li> <li>- <b>Describe instances when a system of equations will yield one solution, no solutions or infinitely many solutions.</b></li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<b>Unit 12: Exponents and Scientific Notation (11 Days)</b>			
<p><b>Expressions and Equations</b></p> <p><b>Work with radicals and integer exponents.</b></p>	<p><b>Expressions and Equations: Work with radicals and integer</b></p>	<p><b>Essential Questions:</b></p> <p><b>How do we simplify expressions</b></p>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises</p>

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<p>Know and apply the properties of integer exponents to generate equivalent numerical expressions. <i>For example, <math>32 \times 3^{-5} = 3^{-3} = 1/33 = 1/27</math>.</i> <b>CC.8.EE.A.1</b></p> <p>Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. <i>For example, estimate the population of the United States as <math>3 \times 10^8</math> and the population of the world as <math>7 \times 10^9</math>, and determine that the world population is more than 20 times larger.</i> <b>CC.8.EE.A.3</b></p> <p>Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. <b>CC.8.EE.A.4</b></p>	<p><b>exponents.</b></p>	<p><b>involving exponents?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Describe and apply the properties of integer exponents to expressions.</b></li> <li>- <b>Estimate and compare very large and very small quantities using scientific notation.</b></li> <li>- <b>Determine how many times bigger one number is than another using scientific notation.</b></li> <li>- <b>Describe when and where to use scientific notation and choose appropriate units for very large and very small numbers.</b></li> <li>- <b>Compare, interpret and calculate values using scientific notation and decimal equivalents in the same problem.</b></li> </ul>	<p>Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>
<p><b>Unit 13: Geometric Relationships (11 Days)</b></p>			
<p><b>Geometry</b></p> <p><b>Understand congruence and similarity using physical models, transparencies, or geometry software.</b></p> <p>Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. <b>CC.8.G.A.5</b></p>	<p><b>Geometry: Understand congruence and similarity using physical models, transparencies, or geometry software.</b></p>	<p><b>Essential Questions:</b></p> <p>What can you conclude about the angles formed by parallel lines that are cut by a transversal?</p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Informally prove angle-sum theory</b></li> <li>- <b>Informally prove the properties of angles when parallel lines are cut by a transversal.</b></li> <li>- <b>Informally prove the angle-angle criterion for</b></li> </ul>	<p><b><u>Formative Assessments:</u></b> Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b><u>Summative Assessments:</u></b> Lesson Quizzes Chapter Tests</p>

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		<b>similar triangles.</b>	Cumulative Assessments Performance Tasks Rubrics
<b>Unit 14: Volume of cones, spheres and cylinders. (12 Days)</b>			
<p><b>Geometry</b></p> <p><b>Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.</b></p> <p>Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. <b>CC.8.G.C.9</b></p>	<p><b>Geometry:</b> Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.</p>	<p><b>Essential Questions:</b></p> <p><b>What is the formula for the volume of a cone, cylinder and sphere?</b></p> <p><b>Learning Targets:</b></p> <ul style="list-style-type: none"> <li>- <b>Know and apply the formulas for volumes of cones, cylinders and spheres.</b></li> </ul>	<p><b>Formative Assessments:</b></p> <p>Textbook Tasks Workbook Exercises Math Journal Daily Problem Vocabulary Homework Classwork Participation Learning Maps</p> <p><b>Summative Assessments:</b></p> <p>Lesson Quizzes Chapter Tests Cumulative Assessments Performance Tasks Rubrics</p>