

Hillsborough Township Public Schools  
Mathematics Department  
Grade 4 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21st Century Connections
<b>Beginning of Year Assessment</b>								
<b>Pacing-1 day</b>								
<b>Unit 1 – Place Value: Multi-digit Addition and Subtraction</b>						Written Assessment, Open Response Question		
<b>Pacing-23 days</b>								
What makes a computational strategy both effective and efficient?	The magnitude of numbers affects the outcome of operations on them.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.  SMP 7 – Look for and make use of structure.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.1 - Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.	Record numbers in expanded form and compare numbers through the hundred-thousands.	Identify digits by place, value and describe the relationship between the places.  321,090  61,447		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
How can we compare and contrast numbers?	A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.  SMP 7 – Look for and make use of structure.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.2 - Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$ , $=$ , $<$ symbols to record the results of comparisons.	Record numbers in expanded form and compare numbers through the hundred-thousands.	Compare numbers through the hundred-thousands.		

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What makes a computational strategy both effective and efficient	Context is critical when using estimation.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.  SMP 7 – Look for and make use of structure.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.3 - Use place value understanding to round multi-digit whole numbers to any place.	Estimate sums of decimals and explain the estimation strategy.	Round numbers through the ten-thousands.		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  Operations and Algebraic Thinking  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model	Use Place value understanding and properties of operations to perform multi-digit arithmetic.  Use the four operations with whole numbers to solve problems.	4.NBT.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.  4.OA.3 - Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of	Solve multi-digit addition and subtraction problems.	Write a word problem for and solve the following problems:  785 + 659 965 – 248  Make an estimate and write a number model. Solve the problem.		9.1.4.A.5- Apply critical thinking and problem-solving skills in classroom and family settings.

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		with mathematics.		answers using mental computations and estimation strategies including rounding.				
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 5 – Use appropriate tools strategically.  SMP 6 – Attend to precision.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.5 - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculations by using equations, rectangular arrays and/or area models.	Convert between US Customary Units of Length.  Develop a formula for finding perimeter of a rectangle.	Find perimeter of objects.		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.
How can change be best represented mathematically?	The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.	Operations and Algebraic Thinking  SMP 7 – Look for and make use of structure.	Generate and analyze patterns.	4.OA.5 - Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.	Use mathematical patterns and structures based on place-value systems.	Decipher mathematical codes using place value.		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Draw and label lines, line segments, and rays.	Give an example of a line, line segment, and ray in the real world and explain the difference between the two.		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

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How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.  SMP 7 – Look for and make use of structure.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.2 - Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	Draw and name angles.	Draw and label two different quadrangles:  *with one pair of parallel sides.  *with two pairs of parallel sides.  Draw and label right angles.	SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grade 4 topics and texts</i> , building on others' ideas and expressing their own clearly.	9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	A quantity can be represented numerically in various ways.  Problem solving depends upon choosing wise ways.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 5 – Use appropriate tools strategically.  SMP 6 – Attend	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in.</i> <i>Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i>  MD.2 - Use the four	Convert US Customary measurements.	Solve conversion problems.		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.

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		to precision  SMP 7 – Look for and make use of structure.  SMP 8 – Look for and express regularity in repeated reasoning.		operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Measurement and Data  SMP 2 – Reason abstractly and quantitatively.  SMP 5 – Use appropriate tools strategically.  SMP 6 – Attend to precision.  SMP 7 – Look	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i>	Find the perimeter of a figure.	Find the perimeter of given classroom objects including student desk, math book, calculator, and name tag. Round each perimeter to the nearest centimeter.		9.1.4.C.1 - Practice collaborative skills in groups, and explain how these skills assist in completing tasks in different settings (at home, in school, and during play).

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		for and make use of structure.						
<b>Unit 2-Multiplication and Geometry</b>						Written Assessment		
<b>Pacing – 22 days</b>						Open Response Question		
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	<p>Numbers and Operations in Base Ten</p> <p>Measurement and Data</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 4 – Model with mathematics.</p> <p>SMP 6 – Attend to precision.</p>	<p>Use place value understanding and properties of operations to perform multi-digit arithmetic.</p> <p>Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p>	<p>4.NBT.5 - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculations by using equations, rectangular arrays and/or area models.</p> <p>4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i></p>	<p>Review rectangular arrays and explore patterns in square numbers.</p> <p>Develop a formula for area of a rectangle.</p> <p>Find factor pairs.</p> <p>Explore how factors and multiples are related.</p> <p>Classify numbers as prime or composite.</p> <p>Create and solve multiplicative comparison statements and equations.</p> <p>Use rules to complete “What’s My Rule?” tables.</p>	<p>Identify factor pairs in arrays.</p> <p>Identify patterns of square numbers.</p> <p>Write equations for arrays.</p> <p>For a given number, list factors and tell whether it is prime or composite.</p> <p>Write an equation to represent multiplicative comparisons.</p> <p>Create a “What’s My Rule” table and have a partner describe its pattern.</p>	<p>RI.4.7 - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.</p>	<p>9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.</p>

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<p>What makes a computational strategy both effective and efficient?</p> <p>How do operations affect numbers?</p>	<p>Computational fluency includes understanding the meaning and the appropriate use of numerical operations.</p>	<p>Number and Operations in Base Ten</p> <p>SMP 2 – Reason abstractly and quantitatively.</p>	<p>Use Place value understanding and properties of operations to perform multi-digit arithmetic.</p>	<p>4.NBT.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p>	<p>Solve multi-digit addition and subtraction problems.</p>	<p>Solve the following problems:</p> <p><math>785 + 659 = \underline{\quad}</math></p> <p><math>965 - 248 = \underline{\quad}</math></p>		<p>9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.</p>
<p>What makes a computational strategy both effective and efficient?</p> <p>How do operations affect numbers?</p>	<p>Computational fluency includes understanding the meaning and the appropriate use of numerical operations.</p>	<p>Number and Operations in Base Ten</p> <p>SMP 2- Reason abstractly and quantitatively.</p> <p>SMP 7 – Look for and make use of structure.</p>	<p>Use Place value understanding and properties of operations to perform multi-digit arithmetic.</p>	<p>4.NBT.6 - Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculations by using equations, rectangular arrays, and/or area models.</p>	<p>Identify prime and composite numbers using division.</p>	<p>Determine whether numbers are Prime or Composite using division:</p> <p>29, 25, 17, 15</p>		
<p>How are patterns of change related to the behavior of functions?</p>	<p>Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.</p>	<p>Operations and Algebraic Thinking</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct</p>	<p>Generate and Analyze patterns.</p>	<p>4.OA.5 - Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p>	<p>Identify a mathematical rule and continue a given pattern.</p>	<p>Write the rule and continue the pattern for the following:</p> <p>12, 24, 36, <math>\underline{\quad}</math>, 60, <math>\underline{\quad}</math></p> <p>31, 44, 57, <math>\underline{\quad}</math>, <math>\underline{\quad}</math></p>	<p>W.4.2. - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p>	<p>9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.</p>

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		viable arguments and critique the reasoning of others.						
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	A quantity can be represented numerically in various ways.	Operations and Algebraic Thinking  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Gain familiarity with factors and multiples.	4.OA.4 - Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	Find factors and multiples of numbers, identify prime and composite numbers.	List 5 multiples of each of the following numbers: 5, 3, 8.  List all the factors of the following numbers: 18, 32, 12.  Tell whether multiples and factors are prime or composite.		
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	Problem solving depends upon choosing wise ways.	Number and Operations in Base Ten  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 3 –	Use the four operations with whole numbers to solve problems.	4.OA.1 - Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.  4.OA.2 - Multiply or	Interpret, explain, and solve multiplicative reasoning problems.	Solve, write an equation and explain your work:  Suzie had 3 balloons. Fred had 4 times as many. How many balloons does Fred have?		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

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		Construct viable arguments and critique the reasoning of others.  SMP 4 – Model with mathematics.		divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.				
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Measurement and Data  SMP 6 – Attend to precision.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i>  4.MD.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes,	Converts larger units of time to smaller units of time and solve number stories involving time.	Pose following problems to students:  9 hours= ___ min.  10 min.= ___ sec.		9.1.4.A.1- Recognize a problem and brainstorm ways to solve the problem individually or collaboratively .

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				masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.2 - Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angle of a specified size. Recognize right triangles as a category, and identify right triangles.	Students classify triangles and quadrilaterals by their properties.	Identify properties of different triangles and quadrilaterals using vocabulary such as: parallel right acute obtuse equilateral scalene adjacent	W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.	9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
What situations can be analyzed using transformations and symmetries?	Shape and area can be conserved during mathematical transformations.	Geometry  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.3 - Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and	Identify and draw lines of symmetry in polygons.	How many lines of symmetry do the following polygons have: regular hexagon; rectangle; regular pentagon; square?		

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				draw lines of symmetry.				
<b>Unit 3-Fractions and Decimals</b>						Written Assessment		
<b>Pacing – 22 days</b>						Open Response Question		
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	<p>Measurement and Data</p> <p>SMP 1 – Make sense of problems and persevere in solving them.</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p> <p>SMP 6 – Attend to precision.</p> <p>SMP 7 – Look for and make use of structure.</p>	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	<p>4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i></p> <p>4.MD.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in</p>	<p>Solve number stories involving equal sharing.</p> <p>Convert from a larger unit of measurement to a smaller unit and from a smaller unit of measurement to a larger unit.</p> <p>Compare decimals.</p>	<p>Solve and explain answer:</p> <p>Four friends shared five apples equally. How much of the apples would each friend get?</p> <p>1 cm= ___ mm. 5 cm= ___ mm</p>	W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

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				a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				
How can we compare and contrast numbers?	A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.	<p>Number and Operations - Fractions</p> <p>SMP 1 - Make sense of problems and persevere in solving them.</p> <p>SMP 2 - Reason abstractly and quantitatively.</p> <p>SMP 3 - Construct viable arguments and critique the reasoning of others.</p> <p>SMP 4 - Model with mathematics. strategically.</p> <p>SMP 6 – Attend to precision.</p>	Extend understanding of fraction equivalence and ordering.	4.NF.1 - Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{nxa}{nxb}$ by using visual fraction models, with attention to how the number and the size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Describe a method for determining fraction equivalency	Explain why $\frac{1}{4} = \frac{3}{12}$ . Use pictures, words, or manipulatives to help.	<p>W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <p>SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.</p>	<p>9.1.4.A.2 - Evaluate available resources that can assist in solving problems.</p> <p>9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.</p>

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How can we compare and contrast numbers?	A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.	Number and Operations - Fractions  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.  SMP 4 – Model with mathematics.	Extend understanding of fraction equivalence and ordering.	4.NF.2 - Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$ . Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , $<$ , and justify the conclusions, e.g., by using a visual fraction model.	Use understanding of fraction equivalencies to order fractions.  Draw conclusions from visual representations.	Create a number line using the following fraction cards.  $\frac{1}{4}$ , $\frac{2}{5}$ , $\frac{9}{10}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $\frac{4}{5}$  Explain why you placed each number on the line.  The fourth graders were surveyed to determine their favorite color. $\frac{1}{3}$ of the students chose yellow as their favorite color. $\frac{1}{4}$ of the students chose purple as their favorite color. Did more students choose yellow or purple as their favorite color? How do you know?	RI.4.7 - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.  9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	Number and Operations - Fractions  SMP 2 - Reason abstractly and quantitatively.  SMP 3 – Construct viable	Understand decimal notation for fractions, and compare decimal fractions.	4.NF.5 - Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.	Find equivalent fractions with denominators of 10 and 100.	Solve:  $\frac{7}{10} = \frac{?}{100}$  $\frac{50}{100} = \frac{?}{10}$		

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		arguments and critique the reasoning of others.  SMP 7 – Look for and make use of structure.		4.NF.6 - Use decimal notation for fractions with denominators 10 or 100.  4.NF.7 - Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , $<$ , and justify the conclusions, e.g., by using a visual model.	Correctly represent decimals for fractions with denominators of 10 and 100.  Compare decimals through hundredths.	For example, rewrite 0.62 as $\frac{62}{100}$ ; describe a length as 0.62 meters; locate 0.62 on a number line diagram.		
How do operations affect numbers?	In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.	Operations and Algebraic Thinking  SMP 1 – Make sense of problems and persevere in solving them.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Use the four operations with whole numbers to solve problems.	4.OA.2 - Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	Solve number stories.	What is half of six?  Jenny is 6 years old. Her brother, John, is 3 times as old as Jenny. How old is John?		9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

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How do operations affect numbers?	The magnitude of numbers affects the outcome of operations on them.	Operations and Algebraic Thinking  SMP 2 – Reason abstractly and quantitatively.  SMP 7 – Look for and make use of structure.	Generate and analyze patterns.	4.OA.5 - Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	Identify, describe and use a rule for a pattern to create equivalent fractions.	Find missing numerators and denominators:  $4/5 = \_ / 20$  $3/4 = 18 / \_$		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
<b>Unit 4 – Multi-digit Multiplication</b>						Written Assessment		
<b>Pacing – 22 days</b>						Open Response Question		
What makes a computational strategy both effective and efficient?	The magnitude of numbers affects the outcome of operations on them.	Operations and Algebraic Thinking  SMP 4 – Model with mathematics.  SMP 7 – Look for and make use of structure.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.1 - Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	Identify places in whole numbers and the value of the digits in those places. Use this information to compute fact extensions.	Solve and explain the pattern in your answers.  $4 * 8 =$ $40 * 8 =$ $80 * 4 =$ $40 * 80 =$		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
What makes a computational strategy both	Computational fluency includes understanding	Number and Operations in Base Ten	Generalize place value understanding for	4.NBT.5 - Multiply a whole number of up to four digits by a one-	Use the partial products algorithm to	Solve the following using the partial products algorithm:	W.4.2 - Write informative/explanatory texts	

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effective and efficient?	the meaning and the appropriate use of numerical operations.	SMP 2 – Reason abstractly and quantitatively.	multi-digit whole numbers.	digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculations by using equations, rectangular arrays and/or area models.	multiply a 1-digit number by a 2-digit number. Multiply multi-digit numbers.	54 * 62 96 * 23  Solve the following and explain the method you used:  87*4 98*52	to examine a topic and convey ideas and information clearly.	
How can we decide when to use an exact answer and when to use an estimate?	Context is critical when using estimation.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others. structure.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.3 - Use place value understanding to round multi-digit whole numbers to any place.	Explain how estimation is used to solve word problems that involve all four operations.	Use estimation to solve the following and explain your thinking:  Find the sum of 437, 261, and 698.  Find the product of 78 * 32.	W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively .
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.	Use Place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Solve multi-digit addition and subtraction problems.	Solve the following problems:  785 + 659  965 - 248		

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How can we compare and contrast numbers?	Numeric fluency includes both the understanding of and the ability to appropriately use numbers.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.2 - Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form.  Compare two multi-digit numbers based on meanings of the digits in each place, using $>$ , $=$ , $<$ symbols to record the results of comparisons.	Solve multi-digit multiplication problems using the distributive property.	Solve this problem: $6 \times 392$  Explain how 6 is distributed over the 300,90, and 2.	SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.	
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in.</i> <i>Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i>  4.MD.2 - Use the four	Use multiplication/division to convert between units of measurement.  Solve number stories involving time and money.	Convert:  $5\text{kg} = \underline{\hspace{1cm}} \text{grams}$ $8,300 \text{ grams} = \underline{\hspace{1cm}} \text{kg}$ $20 \text{ L} = \underline{\hspace{1cm}} \text{ml}$ $6,000\text{ml} = \underline{\hspace{1cm}} \text{L}$  Solve:  Colleen, Joe, and John are going home to California. They buy three train tickets using two one-hundred dollar bills. How much change should they receive?		9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

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				operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				
How can measurements be used to solve problems?	What we measure affects how we measure it.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	Describe and find a strategy for finding area and perimeter of a rectangle.	Find the area and perimeter for the following polygons:  <u>Square</u> : Sides are each 3 cm.  <u>Rectangle</u> : Parallel sides are 4 cm, 2 cm		

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		arguments and critique the reasoning of others.						
How do operations affect numbers?	In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.	<p>Operations and Algebraic Thinking</p> <p>SMP 1 – Make sense of problems and persevere in solving them.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p> <p>SMP 4 – Model with mathematics.</p>	Use the four operations with whole numbers to solve problems.	<p>4.OA.2 - Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</p> <p>4.OA.3 - Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computations and estimation strategies</p>	Write number models to represent comparative number stories. Solve problems and determine reasonableness of answers using estimation.	Lunch tables can each seat 8 students. How many tables are needed to seat 255 students? Estimate first and then write a number model and solve. Draw a picture to illustrate your thinking and explain.	W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively .

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				including rounding.				
<b>Mid- Year Assessment Pacing – 1 day</b>								
<b>Unit 5-Fraction and Mixed-Number Computation; Measurement Pacing - 22 days</b>						Written Assessment Open Response Question		
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	Number and Operations – Fractions  SMP 3 – Construct viable arguments and critique the reasoning of others.  SMP 4 – Model with mathematics.  SMP 5 – Use appropriate tools strategically.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.3 - Understand a fraction $a/b$ with $a > 1$ as a sum of fractions $1/b$ .  4.NF.3a - Understand addition and subtractions of fractions as joining and separating parts referring to the same whole.  4.NF.3b - Decompose a fraction into a sum of fractions with the same denominator in more than one way, recoding each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.	Identify fractions as equal parts of a whole and solve problems involving fractional parts of a whole.  Explain the relationship between a whole and its fractional parts.	Have students solve the following problem:  The blue circle is the whole. Use the yellow fraction circle pieces to show $2/3$ . What equation can you write to show $2/3$ as the sum of the yellow fraction circle pieces?		
How do operations affect numbers?	The magnitude of numbers affects the outcome of operations on them.	Number and Operations - Fractions  SMP 1 – Make sense of problems and persevere in	Build fractions from unit fractions by applying and extending previous understandings of operations on	4.NF.3c - Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using	Use a number line and/or circles to solve fraction addition and subtraction problems, including word problems.	Use a number line and/or circles to solve the following problem:  John’s goal is to read one book by Friday. On	SL.4.1.C-Pose and respond to specific questions to clarify or follow up on information, and make	9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

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		<p>solving them.</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 4 – Model with mathematics.</p>	whole numbers.	<p>properties of operations and the relationship between addition and subtraction.</p> <p>4.NF.3d - Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p>		<p>Wednesday, he had finished 8/12 of the book. How much does he still need to read to reach his goal?</p>	<p>comments that contribute to the discussion and link to the remarks of others.</p>	
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	<p>Number and Operations - Fractions</p> <p>SMP 1 – Make sense of problems and persevere in solving them.</p> <p>SMP 2 – Reason abstractly and quantitatively.</p>	Understand decimal notation for fractions, and compare decimal fractions.	4.NF.5 - Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.	Find equivalent fractions with denominators of 10 and 100.	<p>Solve:</p> <p><math>7/10 = ?/100</math></p> <p><math>50/100 = ?/10</math></p>	SL.4.1.D - Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.	9.1.4.B.1 - Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
How do mathematical ideas interconnect and build on one another to	One representation may sometimes be more helpful than another; used together,	<p>Number and Operations - Fractions</p> <p>SMP 2 – Reason</p>	Understand decimal notation for fractions, and compare decimal fractions.	4.NF.6 - Use decimal notation for fractions with denominators 10 or 100.	Find equivalent fraction with denominators of 10 or 100 and represent it as a decimal.	Complete the following equivalent fractions and represent them as decimals:		

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produce a coherent whole?	multiple representations give a fuller understanding of a problem.	abstractly and quantitatively.				$1/4 = x/100$ $2/5 = x/10$ $1/2 = x/100$ $8/10 = x/100$		
How do operations affect numbers?	The magnitude of numbers affects the outcome of operations on them.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.	Understand decimal notation for fractions, and compare decimal fractions.	4.MD.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Write equations to solve addition problems with unlike denominators.	Have students solve the following problem and explain their answer:  Melanie shaded 0.7 of a hundreds grid. Joanna shaded 0.46 of the same grid. How much did they shade in all?		9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
How can attributes be used to classify data/objects?	Algorithms can effectively and efficiently be used to quantify and interpret discrete information.	Measurement and Data  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.	Represent and interpret data.	4.MD.4 - Make a line plot to display a data set of measurements in fractions of a unit ( $1/2$ , $1/4$ , $1/8$ ). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	Construct a line plot to display and describe data and answer questions based on the data.	A student's science grades consist of:  86, 98, 75, 100, 82, 98, 92  Construct a line plot using this data and create two questions based on the data.	RI.4.7 - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines,	9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

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							<p>animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.</p>	
<p>How can measurements be used to solve problems?</p>	<p>What we measure affects how we measure it.</p>	<p>Measurement and Data</p> <p>SMP 5 – Use appropriate tools strategically.</p> <p>SMP 6 – Attend to precision.</p>	<p>Geometric measurement: understand concepts of angle and measure angles.</p>	<p>4.MD.5 - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:</p> <p>4.MD.5a - An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through <math>\frac{1}{360}</math> of a circle is called a "one-degree angle," and can be used to measure</p>	<p>Estimate to identify angle types and produce estimates that fall within the corresponding range for that angle type.</p>	<p>Using knowledge of angle classifications:</p> <p>Show a <math>90^\circ</math> angle.</p> <p>Show a <math>120^\circ</math> angle.</p> <p>Show a <math>60^\circ</math> angle.</p>		

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				angles.  4.MD.5b - An angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.				
How can we decide when to use an exact answer and when to use an estimate?	Context is critical when using estimation.	Number and Operations in Base Ten  Operations and Algebraic Thinking  SMP 1 – Make sense of problems and persevere in solving them.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Generalize place value understanding for multi-digit whole numbers.  Use the four operations with whole numbers to solve problems.	4.NBT.3 - Use place value understanding to round multi-digit whole numbers to any place.  4.OA.3 - Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computations and estimation strategies including rounding.	Estimate and solve number stories using the four operations.	Estimate, solve, and explain:  Missy hires two painters to paint the walls of her living room. The painters each make \$42/hour for an 8 hour work day. If the work takes 3 days, how much will Missy pay the painters?		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.
How can spatial relationships be described by careful use	Geometric properties can be used to construct geometric figures.	Geometry  SMP 6 – Attend to precision.	Draw and identify lines and angles, and classify shapes by properties of their	4.G.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and	Identify and name different types of angles, draw points, rays, lines, and	Draw angle SEM. Name the vertex and identify any rays.		

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of geometric language?			lines and angles.	parallel lines. Identify these in two-dimensional figures.	line segments.			
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry  SMP 6 – Attend to precision.  SMP 7 – Look for and make use of structure.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.3 - Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Create a symmetrical shape when given one part of the shape.	Create a part of a shape using a geoboard and have partners create the other part.		
<b>Unit 6-Division; Angles; Fraction Operations</b>						Written Assessment		
<b>Pacing – 22 days</b>						Open Response Question		
What makes a computational strategy both effective and efficient?	The magnitude of numbers affects the outcome of operations on them.	Numbers and Operations in Base Ten  SMP 7 – Look for and make use of structure.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.1 - Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.  4.OA.1 - Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5	Explain how to use basic facts to compute fact extensions.	Write and solve a basic division fact and an extended division fact. Explain strategy used to solve problems.  Ex: $27/9=$ $270/9=$		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

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				times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.				
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Use place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.5 - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculations by using equations, rectangular arrays and/or area models.	Use knowledge of multiplication to solve basic and extended division facts and to convert units of weight.	Fill in the missing number:  $7 \times 70 = \underline{\quad}$ $450 \div 9 = \underline{\quad}$  Solve the conversion:  $4,000 \text{ lbs.} = \underline{\quad} \text{ tons}$	SL.4.1.D - Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.	
How do operations affect numbers?	The magnitude of numbers affects the outcome of operations on them.	Number and Operations in Base Ten  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.	Use place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.6 - Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculations by using	Estimate and solve division number stories and interpret remainder.	Estimate and solve the following problem. Interpret the remainder.  The school committee is throwing a Halloween party. They need 250 cans of soda. How many 6-packs of soda do they need to purchase?		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.

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		SMP 3 – Construct viable arguments and critique the reasoning of others.		equations, rectangular arrays, and/or area models.				
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.  SMP 4 – Model with mathematics.	Use Place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Use addition and subtraction to find missing angle measurements, side lengths of rectangles and to aide in solving multiplication problems.	If a rectangle has an area of 40 sq. meters and one side measures 5 meters, what is the measure of the other side?		9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
How can we decide when to use an exact answer and when to use an estimate?	Context is critical when using estimation.	Number and Operations in Base Ten  SMP 2 – Reason abstractly quantitatively.	Generalize place value understanding for multi-digit whole numbers.	4.NBT.3 - Use place value understanding to round multi-digit whole numbers to any place.	Use estimation to solve division problems and determine reasonableness of the answer.	Estimate and solve:  $2,711/9 = \underline{\quad}$		
How can change be best	The symbolic language of	Operations and Algebraic	Generate and analyze patterns.	4.OA.5 - Generate a number or shape	Use rules to complete	Create a “What’s My Rule” table and		

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represented mathematically?	algebra is used to communicate and generalize the patterns in mathematics.	Thinking  SMP 2 – Reason abstractly quantitatively.  SMP 7 – Look for and make use of structure.		pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.	“What’s My Rule?” tables.	have a partner describe its pattern.		
How do operations affect numbers?	The magnitude of numbers affects the outcome of operations on them.	Operations and Algebraic Thinking  SMP 2 – Reason abstractly and quantitatively.	Gain familiarity with factors and multiples.	4.OA.4 - Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	Solve division problems using multiples.	Create a list of multiples of 3 to solve division problem:  42/3=		
How can measurements be used to solve problems?	What we measure affects how we measure it.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 3 – Construct	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems.	Solve division problems involving area of a rectangle.	Solve: The art club is making a rectangular mural for the gym wall. They have 98 square-foot tiles. If the club members want the mural to be 7 feet long, how tall will it be?		9.1.4.B.1 - Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.

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		viable arguments and critique the reasoning of others.						
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Measurement and Data  SMP 3 – Construct viable arguments and critique the reasoning of others.  SMP 4 – Model with mathematics.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i>  4.MD.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms	Use the four operations to convert US Customary units of weight and fraction number stories.	Solve:  Stephanie had a piece of string that was $\frac{4}{12}$ in. long. Joanna gave her a piece of string to tie to hers that was $\frac{8}{12}$ in. long. What is the combined length of the two strings?	RI.4.7 - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.

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				of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				
How can measurements be used to solve problems?	What we measure affects how we measure it.	<p>Measurement and Data</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p> <p>SMP 4 – Model with mathematics.</p> <p>SMP 5 – Use appropriate tools strategically.</p> <p>SMP 6 – Attend to precision.</p>	Geometric measurement: understand concepts of angle and measure angles.	<p>4.MD.5 - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.</p> <p>4.MD.5a - An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through <math>\frac{1}{360}</math> of a circle is called a "one-degree angle," and can be used to measure angles.</p> <p>4.MD.5b - An angle that turns through <math>n</math> one-degree angles is</p>	<p>Measure angles using full or half circle protractor.</p> <p>Use equations to find unknown angle measures.</p> <p>Draw and measure angles.</p> <p>Find the missing part of larger angles.</p>	<p>Draw a right or straight angle. Give students the measurement for a part of the angle and have them solve for the unknown angle measure.</p> <p>Solve: If an angle that measures <math>120^\circ</math> is created of two smaller angles, one of which measures <math>85^\circ</math>, what is the measure of the second angle? How do you know?</p>		

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				<p>said to have an angle measure of <math>n</math> degrees.</p> <p>4.MD.6 - Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</p> <p>4.MD.7 - Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</p>				
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry SMP 3 – Construct viable arguments and critique the reasoning of	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Identify and draw acute, obtuse, and straight angles.	<p>Give an example of an acute, obtuse, or straight angle in the classroom.</p> <p>Point out angles in the classroom and have students</p>		

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		others.				identify their type.		
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	<p>Number and Operations - Fractions</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p>	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	<p>4.NF.3 - Understand a fraction <math>a/b</math> with <math>a &gt; 1</math> as a sum of fractions <math>1/b</math>.</p> <p>4.NF.3a - Understand addition and subtractions of fractions as joining and separating parts referring to the same whole.</p> <p>4.NF.3b - Decompose a fraction into a sum of fractions with the same denominator in more than one way, recoding each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: <math>3/8 = 1/8 + 1/8 + 1/8</math>; <math>3/8 = 1/8 + 2/8</math>; <math>2/8 = 1/8 + 1/8</math>.</p> <p>4.NF.3c - Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using</p>	Decompose fractions into fractional parts	<p>Decompose the following fractions:</p> <p><math>6/8</math> <math>4/12</math></p> <p>Melanie had some leftover fruit from making fruit salad. She had <math>3/12</math> pound of strawberries and <math>1/12</math> pound of blueberries. How many pounds did Melanie have left? How much more did the strawberries weight than the blueberries?</p>		

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				<p>properties of operations and the relationship between addition and subtraction.</p> <p>4.NF.3d - Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p>				
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	<p>Number and Operations - Fractions</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p>	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	<p>4.NF.4b - Understand a multiple of <math>a/b</math> as a multiple of <math>1/b</math>, and use this understanding to multiply a fraction by a whole number.</p> <p>4.NF.4c - Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.</p>	<p>Multiply a whole number by a fraction.</p> <p>Write equations to model and solve number stories.</p>	<p>Solve the following:</p> <p><math>7 * 1/4 =</math></p> <p><math>1/3 * 6 =</math></p> <p>Use drawings to explain your thinking.</p> <p>A recipe calls for <math>2/3</math> cups honey. You decide to double the recipe. How much honey will you need? How do you know?</p>	W.4.2. - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.
<b>Unit 7-Multiplication of a Fraction by a Whole Number; Measurement</b>						Written Assessment Open Response Question		
<b>Pacing - 22 days</b>								

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How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i>  4.MD.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as	Describe the relationships among US customary units of measurement, including solving word problems requiring conversions.	Complete the following conversion problems:  3lbs. = ___ oz. 5 pints= ___ cups  Solve the following problem:  Sue and her sister, Cindy have a lemonade stand. They want to make 6 gallons of lemonade. They only have 1 quart containers. How many 1 quart containers will they need to make the 6 gallons of lemonade?		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.

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				number line diagrams that feature a measurement scale.				
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Measurement and Data  SMP 7 – Look for and make use of structure.  SMP 8 – Look for and express regularity in repeated reasoning.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	Find a rule for rectangular numbers using arrays.	What arrays can be represented by these multiplication equations?  $1*2=2$ $2*3=6$ $3*4=12$	SL.4.1.D - Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.	9.1.4.B.1 - Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
How can attributes be used to classify data/objects?	Algorithms can effectively and efficiently be used to quantify and interpret discrete information.	Measurement and Data  SMP 2 – Reason abstractly and quantitatively.  SMP 6 – Attend to precision.	Represent and interpret data.	4.MD.4 - Make a line plot to display a data set of measurements in fractions of a unit ( $1/2$ , $1/4$ , $1/8$ ). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	Record data on a line plot.	Construct a line plot using this data and describe its characteristics:  $1/8$ , $2 \frac{1}{4}$ , $1/2$ , $5 \frac{1}{2}$ , $3$	W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	
What makes a computational strategy both effective and efficient?  How do operations	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 1 – Make sense of problems and persevere in	Generalize place value understanding for multi-digit whole numbers.  Use place value understanding and	4.NBT.3 - Use place value understanding to round multi-digit whole numbers to any place.  4.NBT.4 - Fluently add and subtract multi-	Estimate and solve a multistep number story using the four operations.	Estimate and solve:  Melanie earned \$5.00 for every driveway she shoveled. If she earned \$120, how many driveways did	SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and	9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively

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<p>affect numbers?</p> <p>How can we decide when to use an exact answer and when to use an estimate?</p>	<p>Context is critical when using estimation.</p>	<p>solving them.</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 4 – Model with mathematics.</p>	<p>properties of operations to perform multi-digit arithmetic.</p>	<p>digit whole numbers using the standard algorithm.</p> <p>4.NBT.5 - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculations by using equations, rectangular arrays and/or area models.</p> <p>4.NBT.6 - Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculations by using equations, rectangular arrays, and/or area models.</p>		<p>she shovel?</p>	<p>teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.</p>	<p>.</p>

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How can we compare and contrast numbers?	A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.	<p>Number and Operations - Fractions</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p> <p>SMP 4 – Model with mathematics.</p>	Extend understanding of fraction equivalence and ordering.	<p>4.NF.1 - Explain why a fraction <math>a/b</math> is equivalent to a fraction <math>(nxa)/(nxb)</math> by using visual fraction models, with attention to how the number and the size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</p> <p>4.NF.2 - Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as <math>1/2</math>. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <math>&gt;</math>, <math>=</math>, <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</p>	Multiply mixed numbers by whole numbers and compare fractions.	<p>Solve:</p> <p><math>2 * 1/8 = \underline{\quad}</math></p> <p><math>3 * 2/6 = \underline{\quad}</math></p> <p>Name a fraction that is larger than <math>3/8</math>, but smaller than <math>7/8</math>.</p>		

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How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	Number and Operations - Fractions  SMP 2 – Reason abstractly and quantitatively.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.3 - Understand a fraction $a/b$ with $a > 1$ as a sum of fractions $1/b$ . 4.NF.3a - Understand addition and subtractions of fractions as joining and separating parts referring to the same whole.	Add and subtract fractions.	Add or subtract fractions:  $\frac{1}{4} + \frac{2}{4} = \underline{\quad}$  $\frac{7}{8} - \frac{2}{8} = \underline{\quad}$		
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations - Fractions  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.3c - Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.  4.NF.3d - Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Solve addition and subtraction fraction number stories.	Solve:  What is the combined weight of two $6 \frac{1}{2}$ lb. pandas and two $7 \frac{1}{2}$ lb. pelicans?		

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How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations - Fractions  SMP 1 – Make sense of problems and persevere in solving them  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.4 - Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.  4.NF.4a - Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a fraction $a/b$ as a multiple of $1/b$ .  4.NF.4b - Understand a multiple of $a/b$ as a multiple of $1/b$ , and use this understanding to multiply a fraction by a whole number.  4.NF.4c - Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	Multiply fractions by whole numbers in number stories.	Solve:  The sugar content of a can of soda is $\frac{1}{4}$ of a cup. If Missy drinks one 12-oz can every day, how much sugar is that in one week?		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.
How do mathematical ideas interconnect and build on one another to	One representation may sometimes be more helpful than another; used together,	Number and Operations - Fractions  SMP 1 – Make sense of	Understand decimal notation for fractions, and compare decimal fractions.	4.NF.6 - Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$ ; describe a length as	Convert between fractions and decimals.	Solve:  An eraser costs \$0.69. If Joanna buys 7 erasers, how much money will		

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produce a coherent whole?	multiple representations give a fuller understanding of a problem.	problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.		0.62 meters; locate 0.62 on a number line diagram.  4.NF.7 - Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , $<$ , and justify the conclusions, e.g., by using a visual model.		she spend?		
How do operations affect numbers?	The magnitude of numbers affects the outcome of operations on them.	Operations and Algebraic Thinking  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.	Use the four operations with whole numbers to solve problems.	4.OA.1 - Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.  4.OA.2 - Multiply or divide to solve word problems involving multiplicative	Use division strategies to solve word problems.	Solve:  Pat and Joan raced each other to see who could skate farther in 6 seconds. Pat went 5 meters, while Joan went 7,500 mm. Who went further, how much further, and how do you know?		9.1.4.A.5 - Apply critical thinking and problem-solving skills in classroom and family settings.

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				comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.				
How do operations affect numbers?	In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.	Operations and Algebraic Thinking  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Use the four operations with whole numbers to solve problems.	4.OA.3 - Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computations and estimation strategies including rounding.	Solve multi-step number stories using any of the four operations.	Solve:  Stephanie wants to put 72 pictures in an album. A square album fits 4 pictures per page. A rectangular album fits 5 pictures per page. How many more pages will she need to fit all the pictures if she uses the square album rather than the rectangular album?		9.1.4.D.1 - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
How can change be best represented mathematically?	The symbolic language of algebra is used to communicate and generalize the patterns in	Operations and Algebraic Thinking  SMP 4 – Model with	Generate and analyze patterns.	4.OA.5 - Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were	Generate and identify patterns in rectangular numbers.	Continue the pattern for the following rectangular numbers: 2, 6, 12, 20, __, __		

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	mathematics.	mathematics.  SMP 7 – Look for and make use of structure.		not explicit in the rule itself.				
<b>Unit 8-Fraction Operations; Applications</b>						Written Assessment Open Response Question		
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.	Use Place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Add and subtract multi-digit numbers.	Add or subtract:  $329-57=$ ____ $5791+76=$ ____		
What makes a computational strategy both effective and efficient?  How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and quantitatively.	Use Place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.5 - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculations by using equations, rectangular arrays and/or area models.	Multiply multi-digit numbers.	Multiply:  $423*5=$ ____  $79*6=$ ____		
What makes a computational strategy both effective and efficient?  How do	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations in Base Ten  SMP 2 – Reason abstractly and	Use Place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.6 - Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the	Divide multi-digit numbers.	Divide:  $8711/5=$ ____  $324/3=$ ____		

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operations affect numbers?		quantitatively.		properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculations by using equations, rectangular arrays, and/or area models.				
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Operations and Algebraic Thinking  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.	Use the four operations with whole numbers to solve problems.	4.OA.3 - Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computations and estimation strategies including rounding.	Solve multi-step word problems using any of the four operations.	Solve:  It takes $\frac{2}{3}$ of a yard of fabric to make a small shirt. How many yards of fabric will it take to make 4 small shirts? If they sell each shirt for \$3.50, how much money would she earn selling all four shirts?		9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively .
How can spatial relationships be described by careful use of geometric	Geometric properties can be used to construct geometric figures.	Geometry  SMP 2 – Reason abstractly and quantitatively.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify	Draw and classify lines, line segments, and rays in angles and other polygons.	Draw a line and label it X,Z. Plot point Y on the line. Create a 45 degree angle using point Y and the vertex.	W.4.2.D - Use precise language and domain-specific vocabulary to	

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language?		SMP 5 – Use appropriate tools strategically.		these in two-dimensional figures.  4.G.2 - Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angle of a specified size. Recognize right triangles as a category, and identify right triangles.	Identify parallel and perpendicular lines.		inform about or explain the topic.	
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry  SMP 6 – Attend to precision.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.3 - Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Identify lines of symmetry in a shape.	Draw figures with one, two, three, and more than three lines of symmetry. Identify the lines of symmetry.		
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Measurement and Data  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 – Reason	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	Solve word problems related to measurement.	Solve:  Missy’s sewing machine needle lasts for 6 ½ hours of sewing time before it needs to be replaced. Missy bought three packages of needles. Each package		9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

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		abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.		<i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversation table for feet and inches listing the number pairs (1, 12), (2, 24), 3, 36), ...</i>  4.MD.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.		contains five needles. If Missy sews for about 2 ½ hours each day, will her needles will her needles last more or less than three weeks?		
How can measurements be used to solve problems?	What we measure affects how we measure it.	Measurement and Data  SMP 2 – Reason abstractly and quantitatively.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems.	Know and apply area and perimeter formulas for rectangles.	Find the length of the missing side:  The perimeter of a rectangle is 8.8cm. One side of the rectangle is 3.8 cm. What are the lengths		

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		SMP 3 – Construct viable arguments and critique the reasoning of others.				of the other three sides?		
How can attributes be used to classify data/objects?	Algorithms can effectively and efficiently be used to quantify and interpret discrete information.	Measurement and Data  SMP 6 – Attend to precision.	Represent and interpret data.	4.MD.4 - Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{8}$ ). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.	Make a line plot and use it to complete addition and subtraction problems involving fractions.	Plot the following fractions on a line plot. $6\frac{1}{2}$ , $9\frac{1}{4}$ , $7\frac{1}{8}$ , $7\frac{1}{2}$ , $8$ , $6\frac{7}{8}$ , $9\frac{1}{4}$ , $9\frac{1}{4}$ , $6\frac{1}{2}$ , $8\frac{3}{8}$  What is the difference between the largest and smallest fraction?	W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	
How can measurements be used to solve problems?	What we measure affects how we measure it.	Measurement and Data  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.  SMP 6 – Attend	Geometric measurement: understand concepts of angle and measure angles.	4.MD.5 - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.  4.MD.5a - An angle is measured with reference to a circle with its center at the	Find unknown angle measures.	Solve:  A circle measures 360 degrees. If the circle were divided into four equal parts, what would be the angle measurement of each part? Explain how you know.	W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.	9.1.4.A.1 - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

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		to precision.  SMP 7 – Look for and make use of structure.		common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles.  4.MD.5b - An angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.				
How can measurements be used to solve problems?	What we measure affects how we measure it.	Measurement and Data  SMP 2 – Reason abstractly and quantitatively.  SMP 4 – Model with mathematics.  SMP 6 – Attend to precision.  SMP 7 – Look for and make use of structure.	Geometric measurement: understand concepts of angle and measure angles.	4.MD.7 - Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle	Find the missing part of larger angles	Solve:  If an angle that measures $120^\circ$ is created of two smaller angles one of which measures $85^\circ$ , what is the measure of the second angle? How do you know?		

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				measure.				
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	<p>Number and Operations - Fractions</p> <p>SMP 2 – Reason abstractly and quantitatively.</p> <p>SMP 3 – Construct viable arguments and critique the reasoning.</p> <p>SMP 4 – Model with mathematics.</p> <p>SMP 5 – Use appropriate tools strategically.</p>	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	<p>4.NF.3 - Understand a fraction <math>a/b</math> with <math>a &gt; 1</math> as a sum of fractions <math>1/b</math>.</p> <p>4.NF.3a - Understand addition and subtractions of fractions as joining and separating parts referring to the same whole.</p> <p>4.NF.3b - Decompose a fraction into a sum of fractions with the same denominator in more than one way, recoding each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples  <math>3/8 = 1/8 + 1/8 + 1/8</math>;  <math>3/8 = 1/8 + 2/8</math>; 2  <math>1/8 = 8/8 + 1/8</math>.</p>	Explain the relationship between a whole and its fractional parts	<p>Use pattern blocks to answer and explain the following:</p> <p>A triangle is what fraction of a hexagon? A trapezoid is what fraction of a double hexagon?</p> <p>Two rhombuses and a triangle is what fraction of a hexagon?</p>	SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.	

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How can we compare and contrast numbers?	A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.	Number and Operations - Fractions  SMP 3 – Construct viable arguments and critique the reasoning.	Extend understanding of fraction equivalence and ordering.	4.NF.2 - Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$ . Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , $<$ , and justify the conclusions, e.g., by using a visual fraction model.	Compare fractions and explain strategies.	Create a number line using the following fraction cards.  $\frac{1}{4}$ , $\frac{2}{5}$ , $\frac{9}{10}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $\frac{4}{5}$  Explain why you placed each number on the line.		
How can we compare and contrast numbers	A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.	Number and Operations - Fractions  SMP 2 – Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning.	Extend understanding of fraction equivalence and ordering.	4.NF.1 - Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{na}{nb}$ by using visual fraction models, with attention to how the number and the size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Describe a method for determining fraction equivalency.	Explain why $\frac{1}{4} = \frac{3}{12}$ . Use pictures, words, or manipulatives to help.	SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing	

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							their own clearly.	
What makes a computational strategy both effective and efficient?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations - Fractions  SMP 1 – Make sense of problems and persevere in solving them.  SMP 2 - Reason abstractly and quantitatively.  SMP 3 – Construct viable arguments and critique the reasoning of others.  SMP 4 – Model with mathematics.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.3c - Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.  4.NF.3d - Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Solve word problems involving addition and subtraction of fractions having like denominators.	Solve:  Melanie had $4\frac{1}{4}$ lbs. of apples at home. She bought $2\frac{1}{4}$ more lbs. at the store. How many pounds does she have altogether?		
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations.	Number and Operations - Fractions  SMP 1 – Make sense of problems and persevere in solving them.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.4 - Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.  4.NF.4b - Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$ , and	Solve multiplication word problems involving fractions.	Solve the following:  $7 * \frac{1}{4} =$  $\frac{1}{3} * 6 =$  Draw and label a number line to solve and explain your thinking.		

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		SMP 2 – Reason abstractly and quantitatively.		use this understanding to multiply a fraction by a whole number.  4.NF.4c - Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.		A recipe calls for $\frac{2}{3}$ cups honey. You decide to double the recipe. How much honey will you need? How do you know?		
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.	Number and Operations - Fractions  SMP 2 – Reason abstractly and quantitatively.  SMP 7 – Look for and make use of structure.	Understand decimal notation for fractions, and compare decimal fractions.	4.NF.5 - Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.  4.NF.6 - Use decimal notation for fractions with denominators 10 or 100.	Convert fractions with denominators of 10 or 100.  Add fractions with denominators of 10 or 100.	Convert: $\frac{2}{10} = \frac{\quad}{100}$ $\frac{40}{100} = \frac{\quad}{10}$  Add fractions: $\frac{3}{10} + \frac{4}{100} = \frac{\quad}{\quad}$ $\frac{5}{10} + \frac{62}{100} = \frac{\quad}{\quad}$		
<b>End-of-Year Assessment Pacing – 1 Day</b>								