Suggested Instructional Timeline: Quarter 1			
Unit 1		9/6/16 – 10/14/16 (6 WEEKS)	
Unit 2		10/17/16 – 11/3/16 (3 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Fourth Grade Mathematics	**Quarter 1 – Unit 1**
Common Core Domains and Clusters:	**Operations & Algebraic Thinking (OA)** - Use the four operations with whole numbers to solve problems. **Numbers & Operations in Base Ten (NBT)** - Generalize place value understanding for multi-digit whole numbers. (Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.) - Use place value understanding and properties of operations to perform multi-digit arithmetic.
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:** **SMP 1** – Making sense of problems and persevere in solving them ***** **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others ***** **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision ***** **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**
Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

NETWORK 12

Fourth Grade Mathematics Planning Map
SY 2016-2017

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS ONE – SIX (9/6/16 – 10/14/16)		
4.OA.3	Solve multistep 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 computation and estimation strategies including rounding.	• **Interpret a multiplication equation as a comparison.** • **Recognize a digit represents 10 times the value of what it represents in the place to its right.** • **Name numbers within 1 million by building understanding of the place value chart and placement of commas for naming base thousand units.** • **Read and write multi-digit numbers using base ten numerals, number names, and expanded form.** • **Compare numbers based on meanings of the digits, using >,<, or = to record the comparison.** • **Find 1, 10, and 100 thousand more and less than a given number.** • **Round multi-digit numbers to the thousands place using the vertical number line.** • **Round multi-digit numbers to any place using the vertical number line.** • **Use place value understanding to round multi-digit numbers to any place value.** • **Use place value understanding to round multi-digit numbers to any place value using real world applications** • **Use place value understanding to fluently add multi-digit whole numbers using the standard addition algorithm and apply the algorithm to solve word problems using tape diagrams.** • **Solve multi-step word problems using the standard addition algorithm modeled with tape diagrams and assess the reasonableness of answers using rounding.** • **Use place value understanding to decompose to smaller**
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 ÷ 70 = 10 by applying concepts of place value and division.	
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 >, =, and < symbols to record the results of comparisons.	
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.	
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm. **(4th Grade Fluency Standard)**	

NETWORK12

		units once using the standard subtraction algorithm, and apply the algorithm to solve word problems using tape diagrams. • **Use place value understanding to decompose to smaller units up to 3 times using the standard subtraction algorithm, and apply the algorithm to solve word problems using tape diagrams.** • **Use place value understanding to fluently decompose to smaller units multiple times in any place using the standard subtraction algorithm, and apply the algorithm to solve word problems using tape diagrams.** • **Solve two-step word problems using the standard subtraction algorithm fluently modeled with tape diagrams and assess the reasonableness of answers using rounding.** • **Create and solve multi-step word problems**
Unpacking: What do these standards mean a child will know and be able to do?		
4.OA.3	The focus in this standard is to have students use and discuss various strategies. It refers to estimation strategies, including using compatible numbers (numbers that sum to 10 or 100) or rounding. Problems should be structured so that all acceptable estimation strategies will arrive at a reasonable answer. Students need many opportunities solving multistep story problems using all four operations. This standard references interpreting remainders. Remainders should be put into context for interpretation. Ways to address remainders: • Remain as a left over • Partitioned into fractions or decimals • Discarded leaving only the whole number answer • Increase the whole number answer up one • Round to the nearest whole number for an approximate result Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies include, but are not limited to:	

	• front-end estimation with adjusting (using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts), • clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate), • rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values), • using friendly or compatible numbers such as factors (students seek to fit numbers together - e.g., rounding to factors and grouping numbers together that have round sums like 100 or 1000), • using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate).
4.NBT.1	This standard calls for students to extend their understanding of place value related to multiplying and dividing by multiples of 10. In this standard, students should reason about the magnitude of digits in a number. Students should be given opportunities to reason and analyze the relationships of numbers that they are working with. In the base-ten system, the value of each place is 10 times the value of the place to the immediate right. Because of this, multiplying by 10 yields a product in which each digit of the multiplicand is shifted one place to the left.
4.NBT.2	This standard refers to various ways to write numbers. Students should have flexibility with the different number forms. Traditional expanded form is 285 = 200 + 80 + 5. Written form or number name is two hundred eighty-five. However, students should have opportunities to explore the idea that 285 could also be 28 tens plus 5 ones or 1 hundred, 18 tens, and 5 ones. To read numerals between 1,000 and 1,000,000, students need to understand the role of commas. Each sequence of three digits made by commas is read as hundreds, tens, and ones, followed by the name of the appropriate base-thousand unit (thousand, million, billion, trillion, etc.). Thus, 457,000 is read “four hundred fifty seven thousand.” The same methods students used for comparing and rounding numbers in previous grades apply to these numbers, because of the uniformity of the base-ten system. Students should also be able to compare two multi-digit whole numbers using appropriate symbols.
4.NBT.3	This standard refers to place value understanding, which extends beyond an algorithm or procedure for rounding. The expectation is that students have a deep understanding of place value and number sense and can explain and reason about the answers they get when they round. Students should have numerous experiences using a number line and a hundreds chart as tools to support their work with rounding.
4.NBT.4	Students build on their understanding of addition and subtraction, their use of place value and their flexibility with multiple strategies to make sense of the standard algorithm. They continue to use place value in describing and justifying the processes they use to add and subtract. This standard refers to fluency, which means accuracy, efficiency (using a reasonable amount of steps and time), and flexibility (using a variety strategies such as the distributive property). This is the first grade level in which students are expected to be

	proficient at using the standard algorithm to add and subtract. However, other previously learned strategies are still appropriate for students to use. Computation algorithm: A set of predefined steps applicable to a class of problems that gives the correct result in every case when the steps are carried out correctly. Computation strategy: Purposeful manipulations that may be chosen for specific problems, may not have a fixed order, and may be aimed at converting one problem into another. In mathematics, an algorithm is defined by its steps and not by the way those steps are recorded in writing. With this in mind, minor variations in methods of recording standard algorithms are acceptable. As with addition and subtraction, students should use methods they understand and can explain. Visual representations such as area and array diagrams that students draw and connect to equations and other written numerical work are useful for this purpose. By reasoning repeatedly about the connection between math drawings and written numerical work, students can come to see multiplication and division algorithms as abbreviations or summaries of their reasoning about quantities. Students can invent and use fast special strategies while also working towards understanding general methods and the standard algorithm. One component of understanding general methods for multiplication is understanding how to compute products of one-digit numbers and multiples of 10, 100, and 1000. This extends work in Grade 3 on products of one-digit numbers and multiples of 10. We can calculate 6 x 700 by calculating 6 x 7 and then shifting the result to the left two places (by placing two zeros at the end to show that these are hundreds) because 6 groups of 7 hundred is 6 x7 hundreds, which is 42 hundreds, or 4, 200. Students can use this place value reasoning, which can also be supported with diagrams of arrays or areas, as they develop and practice using the patterns in relationships among products such as 6 x 7, 6 x 70, 6 x 700, and 6 x 7000. Products of 5 and even numbers, such as 5 x 4, 5 x 40, 5 x 400, 5 x 4000 and 4 x 5, 4 x 50, 4 x 500, 4 x 5000 might be discussed and practiced separately afterwards because they may seem at first to violate the patterns by having an “extra” 0 that comes from the one-digit product. When students begin using the standard algorithm their explanation may be quite lengthy. After much practice with using place value to justify their steps, they will develop fluency with the algorithm. Students should be able to explain why the algorithm works. Students should know that it is mathematically possible to subtract a larger number from a smaller number but that their work with whole numbers does not allow this as the difference would result in a negative number.

Fourth Grade Mathematics	**Quarter 1 – Unit 2**
Common Core Domains and Clusters:	**Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:**

	SMP 1 – Making sense of problems and persevere in solving them * **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others * **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision * **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**
Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS SEVEN – NINE (10/17/16 – 11/3/16)		
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; 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. 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 conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …	• **Express metric length measurements in terms of a smaller unit; model and solve addition and subtraction word problems involving metric length.** • **Express metric mass measurements in terms of a smaller unit; model and solve addition and subtraction word problems involving metric mass.** • **Express metric capacity measurements in terms of a smaller unit; model and solve addition and subtraction word problems involving metric capacity.** • **Know and relate metric units to place value units in order to express measurements in different units.** • **Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity.**
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	
Unpacking: What do these standards mean a child will know and be able to do?		

NETWORK 12

4.MD.1	The units of measure that have not been addressed in prior years are cups, pints, quarts, gallons, pounds, ounces, kilometers, millimeter, milliliters, and seconds. Students' prior experiences were limited to measuring length, mass (metric and customary systems), liquid volume (metric only), and elapsed time. Students did not convert measurements. Students develop benchmarks and mental images about a meter (e.g., about the height of a tall chair) and a kilometer (e.g., the length of 10 football fields including the end zones, or the distance a person might walk in about 12 minutes), and they also understand that "kilo" means a thousand, so 3000 m is equivalent to 3 km. Expressing larger measurements in smaller units within the metric system is an opportunity to reinforce notions of place value. There are prefixes for multiples of the basic unit (meter or gram), although only a few (kilo-, centi-, and milli-) are in common use. Tables such as the one below are an opportunity to develop or reinforce place value concepts and skills in measurement activities. Relating units within the metric system is another opportunity to think about place value. For example, students might make a table that shows measurements of the same lengths in centimeters and meters. Relating units within the traditional system provides an opportunity to engage in mathematical practices, especially "look for and make use of structure" and "look for and express regularity in repeated reasoning" For example, students might make a table that shows measurements of the same lengths in feet and inches.
4.MD.2	This standard includes multi-step word problems related to expressing measurements from a larger unit in terms of a smaller unit (e.g., feet to inches, meters to centimeter, and dollars to cents). Students should have ample opportunities to use number line diagrams to solve word problems.

NETWORK

Fourth Grade Mathematics Planning Map
SY 2016-2017

Suggested Instructional Timeline: Quarter 2			
Unit 1		11/7/16 – 12/23/16 (6 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Fourth Grade Mathematics	**Quarter 2 – Unit 1**
Common Core Domains and Clusters:	**Operations & Algebraic Thinking (OA)** - Use the four operations with whole numbers to solve problems. - Gain familiarity with factors and multiples. **Numbers & Operations in Base Ten (NBT)** - Use place value understanding and properties of operations to perform multi-digit arithmetic. **Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:** **SMP 1** – Making sense of problems and persevere in solving them ***** **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others ***** **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision ***** **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**
Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

NETWORK 12

Fourth Grade Mathematics Planning Map
SY 2016-2017

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS ONE – SIX (11/7/16 – 12/23/16)		
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 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.	• **Investigate and use the formulas for area and perimeter of rectangles.** • **Solve multiplicative comparison word problems by applying the area and perimeter formulas.** • **Demonstrate understanding of area and perimeter formulas by solving multi-step real world problems.** • **Interpret and represent patterns when multiplying by 10, 100, and 1,000 in arrays and numerically.** • **Multiply and divide multiples of 10, 100, and 1,000 by single digits, recognizing patterns.** • **Multiply two-digit multiples of 10 by two-digit multiples of 10 with the area model.** • **Use place value to represent two-digit by one-digit multiplication.** • **Extend the use of place value disks to represent three- and four-digit by one-digit multiplication.** • **Multiply three- and four-digit numbers by one-digit numbers applying the standard algorithm.** • **Connect the area model and the partial products method to the standard algorithm.** • **Solve two-step word problems, including multiplicative comparison.** • **Use multiplication, addition, or subtraction to solve multi-step word problems.** • **Solve division word problems with remainders.** • **Understand and solve division problems with a remainder using the array and area models.** • **Understand and solve two-digit dividend division**
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. (See CCLS Glossary, Table 2.)	
4.OA.3	Solve multistep 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 computation and estimation strategies including rounding.	
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.	
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 calculation by using equations, rectangular arrays, and/or area models.	
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	

NETWORK12

	calculation by using equations, rectangular arrays, and/or area models.	**problems with a remainder in the ones place by using number disks.** • **Represent and solve division problems requiring decomposing a remainder in the tens.** • **Find whole number quotients and remainders.** • **Explain remainders by using place value understanding and models.** • **Solve division problems without remainders using the area model.** • **Solve division problems with remainders using the area model.** • **Find factor pairs for numbers to 100 and use understanding of factors to define prime and composite.** • **Use division and the associative property to test for factors and observe patterns.** • **Determine whether a whole number is a multiple of another number.** • **Explore properties of prime and composite numbers to 100 by using multiples.**
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.	
Unpacking: What do these standards mean a child will know and be able to do?		
4.OA.1	A multiplicative comparison is a situation in which one quantity is multiplied by a specified number to get another quantity (e.g., "a is n times as much as b"). Students should be able to identify and verbalize which quantity is being multiplied and which number tells how many times. Students should be given opportunities to write and identify equations and statements for multiplicative comparisons.	
4.OA.2	This standard calls for students to translate comparative situations into equations with an unknown and solve. Students need many opportunities to solve contextual problems. In a multiplicative comparison, the underling question is what amount would be added to one quantity in order to result in the other. In a multiplicative comparison, the underlying question is what factor would multiply one quantity in order to result in the other. When distinguishing multiplicative comparison from additive comparison, students should note that	

	• additive comparisons focus on the difference between two quantities (e.g., Deb has 3 apples and Karen has 5 apples. How many more apples does Karen have?). A simple way to remember this is, "How many more?" • multiplicative comparisons focus on comparing two quantities by showing that one quantity is a specified number of times larger or smaller than the other (e.g., Deb ran 3 miles. Karen ran 5 times as many miles as Deb. How many miles did Karen run?). A simple way to remember this is "How many times as much?" or "How many times as many?"
4.OA.3	The focus in this standard is to have students use and discuss various strategies. It refers to estimation strategies, including using compatible numbers (numbers that sum to 10 or 100) or rounding. Problems should be structured so that all acceptable estimation strategies will arrive at a reasonable answer. Students need many opportunities solving multistep story problems using all four operations. This standard references interpreting remainders. Remainders should be put into context for interpretation. Ways to address remainders: • Remain as a left over • Partitioned into fractions or decimals • Discarded leaving only the whole number answer • Increase the whole number answer up one • Round to the nearest whole number for an approximate result • Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies include, but are not limited to: • front-end estimation with adjusting (using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts), • clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate), • rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values), • using friendly or compatible numbers such as factors (students seek to fit numbers together - e.g., rounding to factors and grouping numbers together that have round sums like 100 or 1000), • using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate).
4.OA.4	This standard requires students to demonstrate understanding of factors and multiples of whole numbers. This standard also refers to prime and composite numbers. Prime numbers have exactly two factors, the number one and their own number. For example, the

	number 17 has the factors of 1 and 17. Composite numbers have more than two factors. For example, 8 has the factors 1, 2, 4, and 8. A common misconception is that the number 1 is prime, when in fact; it is neither prime nor composite. Another common misconception is that all prime numbers are odd numbers. This is not true, since the number 2 has only2 factors, 1 and 2, and is also an even number. Prime vs. Composite: A prime number is a number greater than 1 that has only 2 factors, 1 and itself. Composite numbers have more than 2 factors. Students investigate whether numbers are prime or composite by: • building rectangles (arrays) with the given area and finding which numbers have more than two rectangles (e.g. 7 can be made into only 2 rectangles, 1 x 7 and 7 x 1, therefore it is a prime number) • finding factors of the number • Students should understand the process of finding factor pairs so they can do this for any number 1 -100, Multiples can be thought of as the result of skip counting by each of the factors. When skip counting, students should be able to identify the number of factors counted e.g., 5, 10, 15, 20 (there are 4 fives in20). To
4.NBT.5	Students who develop flexibility in breaking numbers apart have a better understanding of the importance of place value and the distributive property in multi-digit multiplication. Students use base ten blocks, area models, partitioning, compensation strategies, etc. when multiplying whole numbers and use words and diagrams to explain their thinking. They use the terms factor and product when communicating their reasoning. Multiple strategies enable students to develop fluency with multiplication and transfer that understanding to division. Use of the standard algorithm for multiplication is an expectation in the 5th grade. Another part of understanding general base-ten methods for multi-digit multiplication is understanding the role played by the distributive property. This allows numbers to be decomposed into base-ten units, products of the units to be computed, and then combined. By decomposing the factors into like base-ten units and applying the distributive property, multiplication computations are reduced to single-digit multiplications and products of numbers with multiples of 10, of 100, and of 1000. Students can connect diagrams of areas or arrays to numerical work to develop understanding of general base-ten multiplication methods. Computing products of two two-digit numbers requires using the distributive property several times when the factors are decomposed into base-ten units.
4.NBT.6	In fourth grade, students build on their third grade work with division within 100. Students need opportunities to develop their understandings by using problems in and out of context. General methods for computing quotients of multi-digit numbers and one-digit numbers rely on the same understandings as for multiplication, but cast in terms of division. One component is quotients of multiples of 10, 100, or 1000 and one-digit numbers. For example, 42 ÷ 6 is related to 420 ÷ 6 and 4200 ÷ 6. Students can draw on their work with multiplication and they can also reason that 4200 6 means partitioning 42 hundreds into 6 equal groups, so there are 7 hundreds in each group. Another component of understanding general methods for multi-digit division computation is the idea of decomposing the dividend into like base-ten units and finding the quotient unit by unit, starting with the largest unit and continuing

	on to smaller units. As with multiplication, this relies on the distributive property. This can be viewed as finding the side length of a rectangle (the divisor is the length of the other side) or as allocating objects (the divisor is the number of groups). Multi-digit division requires working with remainders. In preparation for working with remainders, students can compute sums of a product and a number, such as 4 x 8 + 3. In multi-digit division, students will need to find the greatest multiple less than a given number. For example, when dividing by 6, the greatest multiple of6 less than 50 is 6 x 8 = 48. Students can think of these "greatest multiples" in terms of putting objects into groups. For example, when 50 objects are shared among 6 groups, the largest whole number of objects that can be put in each group is 8, and 2 objects are left over. (Or when 50 objects are allocated into groups of 6, the largest whole number of groups that can be made is 8, and 2 objects are left over.) The equation 6 x 8 + 2 = 50 (or8 x 6 + 2 = 50) corresponds with this situation. Cases involving 0 in division may require special attention.
4.MD.3	Based on work in third grade students learn to consider perimeter and area of rectangles. Fourth graders multiplication, spatially structuring arrays, and area, they abstract the formula for the area of a rectangle A = l x w. • The formula is a generalization of the understanding, that, given a unit of length, a rectangle whose sides have length w units and l units, can be partitioned into w rows of unit squares with l squares in each row. The product l x w gives the number of unit squares in the partition, thus the area measurement is l x w square units. These square units are derived from the length unit. Students generate and discuss advantages and disadvantages of various formulas for the perimeter length of a rectangle that is l units by w units. • For example, P = 2l + 2w has two multiplications and one addition, but P = 2(l + w), which has one addition and one multiplication, involves fewer calculations. The latter formula is also useful when generating all possible rectangles with a given perimeter. The length and width vary across all possible pairs whose sum is half of the perimeter (e.g., for a perimeter of 20, the length and width are all of the pairs of numbers with sum 10). Giving verbal summaries of these formulas is also helpful. For example, a verbal summary of the basic formula, A= l + w + l + w, is "add the lengths of all four sides." Specific numerical instances of other formulas or mental calculations for the perimeter of a rectangle can be seen as examples of the properties of operations, e.g., 2l + 2w =2(l + w) illustrates the distributive property. Perimeter problems often give only one length and one width, thus remembering the basic formula can help to prevent the usual error of only adding one length and one width. The formula P = 2 (l x w) emphasizes the step of multiplying the total of the given lengths by 2. Students can make a transition from showing all length units along the sides of a rectangle or all area units within by drawing a rectangle showing just parts of these as a reminder of which kind of unit is being used. Writing all of the lengths around a rectangle can also be useful. Discussions of formulas such as P = 2l + 2w, can note that unlike area formulas, perimeter formulas combine length measurements to yield a length measurement. Such abstraction and use of formulas underscores the importance of distinguishing between area and perimeter in Grade 3 and maintaining the distinction in Grade 4 and later grades, where rectangle perimeter and area problems may get more complex and problem solving can benefit from knowing or being able to rapidly remind oneself of how

	to find an area or perimeter. By repeatedly reasoning about how to calculate areas and perimeters of rectangles, students can come to see area and perimeter formulas as summaries of all such calculations.

NETWORK 12

Fourth Grade Mathematics Planning Map
SY 2016-2017

Suggested Instructional Timeline: Quarter 2 & 3			
Crossover Unit		1/9/17 – 3/17/17 (10 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Fourth Grade Mathematics	**Quarter 2 & 3 – Crossover Unit**
Common Core Domains and Clusters:	**Numbers & Operations - Fractions (NF)** - Extend understanding of fraction equivalence and ordering. - Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. - Understand decimal notations for fractions, and compare decimal fractions. **Measurement & Data (MD)** - Represent and interpret data.
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:** **SMP 1** – Making sense of problems and persevere in solving them ***** **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others ***** **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision ***** **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**
Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

NETWORK 12

Common Core Standards		Skill Focus: Students will understand how to...
QUARTER 2 [WEEKS FIVE – NINE] & QUARTER 3 [WEEKS ONE – SIX] (1/9/17 – 3/17/17)		
4.NF.1	Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	• **Decompose fractions as a sum of unit fractions using tape diagrams.** • **Decompose non-unit fractions and represent them as a whole number times a unit fraction using tape diagrams.** • **Decompose fractions into sums of smaller unit fractions using tape diagrams.** • **Decompose unit fractions using area models to show equivalence.** • **Decompose fractions using area models to show equivalence.** • **Use the area model and multiplication to show the equivalence of two fractions.** • **Use the area model and division to show the equivalence of two fractions.** • **Explain fraction equivalence using a tape diagram and the number line, and relate that to the use of multiplication and division.** • **Reason using benchmarks to compare two fractions on the number line.** • **Find common units or number of units to compare two fractions.** • **Use visual models to add and subtract two fractions with the same units.** • **Use visual models to add and subtract two fractions with the same units, including subtracting from one whole.**
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 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	
4.NF.3	Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8. c. 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. d. 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.	

NETWORK 12

4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4). b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.) c. 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. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?	• **Add and subtract more than two fractions.** • **Solve word problems involving addition and subtraction of fractions.** • **Use visual models to add two fractions with related units** • **Add a fraction less than 1 to, or subtract a fraction less than 1 from, a whole number using decomposition and visual models.** • **Add and multiply unit fractions to build fractions greater than 1 using visual models.** • **Decompose and compose fractions greater than 1 to express them in various forms.** • **Compare fractions greater than 1 by reasoning using benchmark fractions.** • **Compare fractions greater than 1 by creating common numerators or denominators.** • **Solve word problems with line plots.** • **Estimate sums and differences using benchmark numbers.** • **Add a mixed number and a fraction.** • **Add mixed numbers.** • **Subtract a fraction from a mixed number** • **Subtract a mixed number from a mixed number.** • **Represent the multiplication of n times a/b as (n × a)/b using the associative property and visual models.** • **Find the product of a whole number and a mixed number using the distributive property.** • **Solve multiplicative comparison word problems involving fractions.** • **Solve word problems involving the multiplication of a**
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. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.)	
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 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	

NETWORK12

	refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	**whole number and a fraction including those involving line plots.** • **Represent mixed numbers with units of tens, ones, and tenths with number disks, on the number line, and in expanded form** • **Model the equivalence of tenths and hundredths using the area model** • **Use the area model and number line to represent mixed numbers with units of ones, tenths, and hundredths in fraction and decimal forms.** • **Model mixed numbers with units of hundreds, tens, ones, tenths, and hundredths in expanded form and on the place value chart.** • **Use understanding of fraction equivalence to investigate decimal numbers on the place value chart expressed in different units** • **Use area models and the number line to compare decimal numbers, and record comparisons using <, >, and =.** • **Compare and order mixed numbers in various forms.** • **Apply understanding of fraction equivalence to add tenths and hundredths.** • **Add decimal numbers by converting to fraction form.**
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. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.	
Unpacking: What do these standards mean a child will know and be able to do?		
4.NF.1	This standard refers to visual fraction models. This includes area models, number lines or it could be a collection/set model. This standard extends the work in third grade by using additional denominators. (5, 10, 12 and 100) This standard addresses equivalent fractions by examining the idea that equivalent fractions can be created by multiplying both the numerator and denominator by the same number or by dividing a shaded region into various parts. Students should begin to notice connections between the models and fractions in the way both the parts and wholes are counted and begin to generate a rule for writing equivalent fractions. There is NO mathematical reason why fractions must be written in simplified form, although it may be convenient to do so in some cases.	

4.NF.2	This standard calls students to compare fractions by creating visual fraction models or finding common denominators or numerators. Students' experiences should focus on visual fraction models rather than algorithms. When tested, models may or may not be included. Students should learn to draw fraction models to help them compare. Students must also recognize that they must consider the size of the whole when comparing fractions (ie, . and 1/8 of two medium pizzas is very different from . of one medium and 1/8 of one large). In fifth grade students who have learned about fraction multiplication can see equivalence as "multiplying by 1". However, although a useful mnemonic device, this does not constitute a valid argument at fourth grade, since students have not yet learned fraction multiplication.
4.NF.3	A fraction with a numerator of one is called a unit fraction. When students investigate fractions other than unit fractions, such as 2/3, they should be able to join (compose) or separate (decompose) the fractions of the same whole. Students should justify their breaking apart (decomposing) of fractions using visual fraction models. The concept of turning mixed numbers into improper fractions needs to be emphasized using visual fraction models. Similarly, converting an improper fraction to a mixed number is a matter of decomposing the fraction into a sum of a whole number and a number less than 1. Students can draw on their knowledge from third grade of whole numbers as fractions. A separate algorithm for mixed numbers in addition and subtraction is not necessary. Students will tend to add or subtract the whole numbers first and then work with the fractions using the same strategies they have applied to problems that contained only fractions. Mixed numbers are introduced for the first time in Fourth Grade. Students should have ample experiences of adding and subtracting mixed numbers where they work with mixed numbers or convert mixed numbers so that the numerator is equal to or greater than the denominator. Fourth Grade students should be able to decompose and compose fractions with the same denominator. They add fractions with the same denominator. Using the understanding gained from work with whole numbers of the relationship between addition and subtraction, they also subtract fractions with the same denominator. Students also compute sums of whole numbers and fractions, by representing the whole number as an equivalent fraction with the same denominator as the fraction. Students use this method to add mixed numbers with like denominators. Converting a mixed number to a fraction should not be viewed as a separate technique to be learned by rote, but simply as a case of fraction addition. Students solve word problems involving addition and subtraction of a fraction by a whole number. Students will use different visuals to represent what the problem is asking of them.
4.NF.4	This standard builds on students' work of adding fractions and extending that work into multiplication. Students should see a fraction as the numerator times the unit fraction with the same denominator. This standard extended the idea of multiplication as repeated addition. Students are expected to use and create visual fraction models to multiply a whole number by a fraction. The same thinking, based on the analogy between fractions and whole numbers, allows students to give meaning to the product of whole number and a fraction. When introducing this standard make sure student use visual fraction models to solve word problems related to multiplying a whole number by a fraction. Students solve word problems involving multiplication of a fraction by a whole number.

4.NF.5	This standard continues the work of equivalent fractions by having students change fractions with a 10 in the denominator into equivalent fractions that have a 100 in the denominator. In order to prepare for work with decimals (4.NF.6 and 4.NF.7), experiences that allow students to shade decimal grids (10x10 grids) can support this work. Student experiences should focus on working with grids rather than algorithms. Students can also use base ten blocks and other place value models to explore the relationship between fractions with denominators of 10 and denominators of 100. Students in fourth grade work with fractions having denominators 10 and 100. Because it involves partitioning into 10 equal parts and treating the parts as numbers called one tenth and one hundredth, work with these fractions can be used as preparation to extend the base-ten system to non-whole numbers.
4.NF.6	Decimals are introduced for the first time. Students should have ample opportunities to explore and reason about the idea that a number can be represented as both a fraction and a decimal. Students make connections between fractions with denominators of 10 and 100 and the place value chart. Students use the representations explored in 4.NF.5 to understand 32/100 can be expanded to 3/10 and 2/100.
4.NF.7	Students should reason that comparisons are only valid when they refer to the same whole. Visual models include area models, decimal grids, decimal circles, number lines, and meter sticks. The decimal point is used to signify the location of the ones place, but its location may suggest there should be a “oneths” place to its right in order to create symmetry with respect to the decimal point. However, because one is the basic unit from which the other base ten units are derived, the symmetry occurs instead with respect to the ones place. Ways of reading decimals aloud vary. Mathematicians and scientists often read 0.15 aloud as “zero point one five” or “point one five.” (Decimals smaller than one may be written with or without a zero before the decimal point.) Decimals with many non-zero digits are more easily read aloud in this manner. (For example, the number π, which has infinitely many non-zero digits, begins
4.MD.4	This standard provides a context for students to work with fractions by measuring objects to an eighth of an inch. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot.

Suggested Instructional Timeline: Quarter 3			
Unit 2		3/20/17 – 4/6/17 (3 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Fourth Grade Mathematics	**Quarter 3– Unit 1**
Common Core Domains and Clusters:	**Operations & Algebraic Thinking (OA)** - Generate and analyze patterns. **Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:** **SMP 1** – Making sense of problems and persevere in solving them ***** **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others ***** **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision ***** **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**
Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

NETWORK 12

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS SEVEN – NINE (3/20/17 – 4/6/17)		
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.	• **Use metric measurement to model the decomposition of one whole into tenths.** • **Use metric measurement and area models to represent tenths as fractions greater than 1 and decimal numbers.** • **Use meters to model the decomposition of one whole into hundredths. Represent and count hundredths.** • **Use the place value chart and metric measurement to compare decimals and answer comparison questions.** • **Solve word problems involving the addition of measurements in decimal form.** • **Use addition properties and subtraction rules to add and subtract**
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.	
Unpacking: What do these standards mean a child will know and be able to do?		
4.MD.2	This standard includes multi-step word problems related to expressing measurements from a larger unit in terms of a smaller unit (e.g., feet to inches, meters to centimeter, and dollars to cents). Students should have ample opportunities to use number line diagrams to solve word problems.	
4.OA.5	Patterns involving numbers or symbols either repeat or grow. Students need multiple opportunities creating and extending number and shape patterns. Numerical patterns allow students to reinforce facts and develop fluency with operations. Patterns and rules are related. A pattern is a sequence that repeats the same process over and over. A rule dictates what that process will look like. Students investigate different patterns to find rules, identify features in the patterns, and justify the reason for those features. After students have identified rules and features from patterns, they need to generate a numerical or shape pattern from a given rule. This standard calls for students to describe features of an arithmetic number pattern or shape pattern by identifying the rule, and features that are not explicit in the rule. A t-chart is a tool to help students see number patterns. This standard begins with a small focus on reasoning about a number or shape pattern, connecting a rule for a given pattern with its sequence of numbers or shapes. Patterns that consist of repeated sequences of shapes or growing sequences of designs can be appropriate for the grade. For example, students could examine a sequence of dot designs in which each design has 4 more dots than the previous one and they could reason about how the	

	dots are organized in the design to determine the total number of dots in the 100th design. In examining numerical sequences, fourth graders can explore rules of repeatedly adding the same whole number or repeatedly multiplying by the same whole number. Properties of repeating patterns of shapes can be explored with division. For example, to determine the 100th shape in a pattern that consists of repetitions of the sequence “square, circle, triangle,” the fact that when we divide 100 by3 the whole number quotient is 33 with remainder 1 tells us that after 33 full repeats, the 99th shape will be a triangle (the last shape in the repeating pattern), so the 100th shape is the first shape in the pattern, which is a square. Notice that the Standards do not require students to infer or guess the underlying rule for a pattern, but rather ask them to generate a pattern from a given rule and identify features of the given pattern

NETWORK

Suggested Instructional Timeline: Quarter 4			
Unit 1		4/17/17 – 5/19/17 (5 WEEKS)	
Unit 2		5/22/17 – 6/16/17 (4 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Fourth Grade Mathematics	**Quarter 4– Unit 1**
Common Core Domains and Clusters:	**Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.1 - Geometric measurement: understand concepts of angle and measure angles. **Geometry (G)** - Draw and identify lines and angles, and classify shapes by properties of their lines and angles. **Operations & Algebraic Thinking (OA)** - Use the four operations with whole numbers to solve problems. **Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.1
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:** **SMP 1** – Making sense of problems and persevere in solving them ***** **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others ***** **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision ***** **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**

Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE - FIVE (4/17/17 – 5/19/17)		
4.MD.5	Recognize angles as geometric shapes that are formed whenever two rays share a common endpoint, and understand concepts of angle measurement: a. 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 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	• **Identify and draw points, lines, line segments, rays, and angles and recognize them in various contexts and familiar figures.** • **Use right angles to determine whether angles are equal to, greater than, or less than right angles. Draw right, obtuse, and acute angles.** • **Identify, define, and draw perpendicular lines.** • **Identify, define, and draw parallel lines.** • **Use varied protractors to distinguish angle measure from length measurement.** • **Measure and draw angles. Sketch given angle measures and verify with a protractor.** • **Identify and measure angles as turns and recognize them in various contexts.** • **Decompose angles using pattern blocks.** • **Use the addition of adjacent angle measures to solve problems using a symbol for the unknown angle measure** • **Recognize lines of symmetry for given two-dimensional figures; identify line-symmetric figures and draw lines of symmetry.** • **Analyze and classify triangles based on side length, angle measure, or both.** • **Define and construct triangles from given criteria. Explore symmetry in triangles.**
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	
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.	
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify 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	

NETWORK 12

	absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	• **Classify quadrilaterals based on parallel and perpendicular lines and the presence or absence of angles of a specified size.**
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.	
Unpacking: What do these standards mean a child will know and be able to do?		
4.MD.5	This standard brings up a connection between angles and circular measurement (360 degrees). Angle measure is a "turning point" in the study of geometry. Students often find angles and angle measure to be difficult concepts to learn, but that learning allows them to engage in interesting and important mathematics. An angle is the union of two rays, a and b, with the same initial point P. The rays can be made to coincide by rotating one to the other about P; this rotation determines the size of the angle between a and b. The rays are sometimes called the sides of the angles. Another way of saying this is that each ray determines a direction and the angle size measures the change from one direction to the other. Angles are 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 1/360 of a circle is called a "one-degree angle," and degrees are the unit used to measure angles in elementary school. A full rotation is thus 360º. Two angles are called complementary if their measurements have the sum of 90º. Two angles are called supplementary if their measurements have the sum of 180º. Two angles with the same vertex that overlap only at a boundary (i.e., share a side) are called adjacent angles. These terms may come up in classroom discussion, they will not be tested. This concept is developed thoroughly in middle school (7th grade). Like length, area, and volume, angle measure is additive: The sum of the measurements of adjacent angles is the measurement of the angle formed by their union. This leads to other important properties. If a right angle is decomposed into two adjacent angles, the sum is 90º, thus they are complementary. Two adjacent angles that compose a "straight angle" of 180º must be supplementary.	
4.MD.6	Before students begin measuring angles with protractors, they need to have some experiences with benchmark angles. They transfer their understanding that a 360º rotation about a point makes a complete circle to recognize and sketch angles that measure approximately 90º and 180º. They extend this understanding and recognize and sketch angles that measure approximately 45º and 30º. They use appropriate terminology (acute, right, and obtuse) to describe angles and rays (perpendicular). As with all measureable attributes, students must first recognize the attribute of angle measure, and distinguish it from other attributes. As with other concepts students need varied examples and explicit discussions to avoid learning limited ideas about measuring angles (e.g., misconceptions that a right angle is an angle that points to the right, or two right angles represented with different orientations are not equal in measure). If examples and tasks are not varied, students can develop incomplete and inaccurate notions. For example, some come to associate all slanted lines with 45º measures and horizontal and vertical lines with measures of 90º. Others believe	

	angles can be “read off” a protractor in “standard” position, that is, a base is horizontal, even if neither ray of the angle is horizontal. Measuring and then sketching many angles with no horizontal or vertical ray perhaps initially using circular 360º protractors can help students avoid such limited conceptions.
4.MD.7	This standard addresses the idea of decomposing (breaking apart) an angle into smaller parts. Students can develop more accurate and useful angle and angle measure concepts if presented with angles in a variety of situations. They learn to find the common features of superficially different situations such as turns in navigation, slopes, bends, corners, and openings. With guidance, they learn to represent an angle in any of these contexts as two rays, even when both rays are not explicitly represented in the context; for example, the horizontal or vertical in situations that involve slope (e.g., roads or ramps), or the angle determined by looking up from the horizon to a tree or mountain-top. Eventually they abstract the common attributes of the situations as angles (which are represented with rays and a vertex,) and angle measurements. Students with an accurate conception of angle can recognize that angle measure is additive. As with length, area, and volume, 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. Students can then solve interesting and challenging addition and subtraction problems to find the measurements of unknown angles on a diagram in real world and mathematical problems. For example, they can find the measurements of angles formed a pair of intersecting lines, as illustrated above, or given a diagram showing the measurement of one angle, find the measurement of its complement. They can use a protractor to check, not to check their reasoning, but to ensure that they develop full understanding of the mathematics and mental images for important benchmark angles (e.g., 30º, 45º, 60º, and 90º).
4.G.1	This standard asks students to draw two-dimensional geometric objects and to also identify them in two dimensional figures. This is the first time that students are exposed to rays, angles, and perpendicular and parallel lines. Examples of points, line segments, lines, angles, parallelism, and perpendicularity can be seen daily. Students may not easily identify lines and rays because they are more abstract. Student should be able to use side length to classify triangles as equilateral, equiangular, isosceles, or scalene; and can use angle size to classify them as acute, right, or obtuse. They then learn to cross-classify, for example, naming a shape as a right isosceles triangle. Thus, students develop explicit awareness of and vocabulary for many concepts they have been developing, including points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Such mathematical terms are useful in communicating geometric ideas, but more important is that constructing examples of these concepts, such as drawing angles and triangles that are acute, obtuse, and right, help students form richer concept images connected to verbal definitions. That is, students have more complete and accurate mental images and associated vocabulary for geometric ideas (e.g., they understand that angles can be larger than 90 and their concept images for angles include many images of such obtuse angles). Similarly, students see points and lines as abstract objects: Lines are infinite in extent and points have location but no dimension. Grids are made of points and lines and do not end at the edge of the paper. Students also learn to apply these concepts in varied contexts. For example, they learn to represent angles that occur in various contexts as two rays, explicitly including the reference line, e.g., a horizontal or vertical line

	when considering slope or a "line of sight" in turn contexts. They understand the size of the angle as a rotation of a ray on the reference line to a line depicting slope or as the "line of sight" in computer environments. Analyzing the shapes in order to construct them requires students to explicitly formulate their ideas about the shapes. For instance, what series of commands would produce a square? How many degrees are the angles? What is the measure of the resulting angle? What would be the commands for an equilateral triangle? How many degrees are the angles? What is the measure of the resulting angle? Such experiences help students connect what are often initially isolated ideas about the concept of angle.
4.G.2	Two-dimensional figures may be classified using different characteristics such as, parallel or perpendicular lines or by angle measurement. Parallel or Perpendicular Lines: Students should become familiar with the concept of parallel and perpendicular lines. Two lines are parallel if they never intersect and are always equidistant. Two lines are perpendicular if they intersect in right angles (90º). Students may use transparencies with lines to arrange two lines in different ways to determine that the 2 lines might intersect in one point or may never intersect. Further investigations may be initiated using geometry software. These types of explorations may lead to a discussion on angles. A kite is a quadrilateral whose four sides can be grouped into two pairs of equal-length sides that are beside (adjacent to) each other. This standard calls for students to sort objects based on parallelism, perpendicularity and angle types. Angle Measurement: This expectation is closely connected to 4.MD.5, 4.MD.6, and 4.G.1. Students' experiences with drawing and identifying right, acute, and obtuse angles support them in classifying two-dimensional figures based on specified angle measurements. They use the benchmark angles of 90°, 180°, and 360° to approximate the measurement of angles. Right triangles can be a category for classification. A right triangle has one right angle. There are different types of right triangles. An isosceles right triangle has two or more congruent sides and a scalene right triangle has no congruent sides.
4.G.3	Students need experiences with figures which are symmetrical and non-symmetrical. Figures include both regular and non-regular polygons. Folding cut-out figures will help students determine whether a figure has one or more lines of symmetry. This standard only includes line symmetry not rotational symmetry.

Fourth Grade Mathematics	Quarter 4– Unit 2
Common Core Domains and Clusters:	**Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.1 - Geometric measurement: understand concepts of angle and measure angles. **Geometry (G)** - Draw and identify lines and angles, and classify shapes by properties of their lines and angles. **Operations & Algebraic Thinking (OA)** - Use the four operations with whole numbers to solve problems. **Measurement & Data (MD)** - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.1
Standards for Mathematical Practice (SMP):	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:** **SMP 1** – Making sense of problems and persevere in solving them ***** **SMP 2** – Reason Abstractly and quantitatively **SMP 3** – Constructing viable arguments and critique the reasoning of others ***** **SMP 4** – Model with Mathematics **SMP 5** – Use appropriate tools strategically **SMP 6** – Attend to precision ***** **SMP 7** –Look for and make use of structure **SMP 8** – Look for and express regularity in repeated reasoning *** The District's required SMPs**
Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard by the end of the year:** **4.NBT.4 -** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

NETWORK 12

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS SIX – NINE (5/22/17 – 6/16/17)		
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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.	• **Create conversion tables for length, weight, and capacity units using measurement tools, and use the tables to solve problems.** • **Create conversion tables for units of time, and use the tables to solve problems.** • **Solve multiplicative comparison word problems using measurement conversion tables.** • **Solve Problems involving mixed units of capacity.** • **Solve problems involving mixed units of length.** • **Solve problems involving mixed units of weight.** • **Solve problem involving mixed units of time.** • **Solve multi-step measurement word problems.** • **Use measurement tools to convert mixed number measurements to smaller units.** • **Solve multi-step word problems involving converting mixed number measurements to a single unit.** • **Create and determine the area of composite figures.**
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. (See CCSS Glossary, Table 2.)	
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 computation and estimation strategies including rounding.	
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; 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. For example, know that 1 ft is 12 times as long as 1 in. Express length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ….	
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	

NETWORK 12

	measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	
Unpacking: What do these standards mean a child will know and be able to do?		
4.OA.1	A multiplicative comparison is a situation in which one quantity is multiplied by a specified number to get another quantity (e.g., "a is n times as much as b"). Students should be able to identify and verbalize which quantity is being multiplied and which number tells how many times. Students should be given opportunities to write and identify equations and statements for multiplicative comparisons.	
4.OA.2	This standard calls for students to translate comparative situations into equations with an unknown and solve. Students need many opportunities to solve contextual problems. In a multiplicative comparison, the underling question is what amount would be added to one quantity in order to result in the other. In a multiplicative comparison, the underlying question is what factor would multiply one quantity in order to result in the other. When distinguishing multiplicative comparison from additive comparison, students should note that • additive comparisons focus on the difference between two quantities (e.g., Deb has 3 apples and Karen has 5 apples. How many more apples does Karen have?). A simple way to remember this is, "How many more?" • multiplicative comparisons focus on comparing two quantities by showing that one quantity is a specified number of times larger or smaller than the other (e.g., Deb ran 3 miles. Karen ran 5 times as many miles as Deb. How many miles did Karen run?). A simple way to remember this is "How many times as much?" or "How many times as many?"	
4.OA.3	The focus in this standard is to have students use and discuss various strategies. It refers to estimation strategies, including using compatible numbers (numbers that sum to 10 or 100) or rounding. Problems should be structured so that all acceptable estimation strategies will arrive at a reasonable answer. Students need many opportunities solving multistep story problems using all four operations. This standard references interpreting remainders. Remainders should be put into context for interpretation. Ways to address remainders: • Remain as a left over • Partitioned into fractions or decimals • Discarded leaving only the whole number answer • Increase the whole number answer up one • Round to the nearest whole number for an approximate result • Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies include, but are not limited to:	

	• front-end estimation with adjusting (using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts), • clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate), • rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values), • using friendly or compatible numbers such as factors (students seek to fit numbers together - e.g., rounding to factors and grouping numbers together that have round sums like 100 or 1000), • using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate).
4.MD.1	The units of measure that have not been addressed in prior years are cups, pints, quarts, gallons, pounds, ounces, kilometers, millimeter, milliliters, and seconds. Students' prior experiences were limited to measuring length, mass (metric and customary systems), liquid volume (metric only), and elapsed time. Students did not convert measurements. Students develop benchmarks and mental images about a meter (e.g., about the height of a tall chair) and a kilometer (e.g., the length of 10 football fields including the end zones, or the distance a person might walk in about 12 minutes), and they also understand that "kilo" means a thousand, so 3000 m is equivalent to 3 km. Expressing larger measurements in smaller units within the metric system is an opportunity to reinforce notions of place value. There are prefixes for multiples of the basic unit (meter or gram), although only a few (kilo-, centi-, and milli-) are in common use. Tables such as the one below are an opportunity to develop or reinforce place value concepts and skills in measurement activities. Relating units within the metric system is another opportunity to think about place value. For example, students might make a table that shows measurements of the same lengths in centimeters and meters. Relating units within the traditional system provides an opportunity to engage in mathematical practices, especially "look for and make use of structure" and "look for and express regularity in repeated reasoning" For example, students might make a table that shows measurements of the same lengths in feet and inches.
4.MD.2	This standard includes multi-step word problems related to expressing measurements from a larger unit in terms of a smaller unit (e.g., feet to inches, meters to centimeter, and dollars to cents). Students should have ample opportunities to use number line diagrams to solve word problems.