Third Grade Mathematics Planning Map
SY 2016-2017

Suggested Instructional Timeline: Quarter 1			
Unit 1		9/6/16 – 10/7/16 (5 WEEKS)	
Unit 2		10/11/16 – 11/3/16 (4 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Third Grade Mathematics	**Quarter 1 – Unit 1**
Common Core Domains and Clusters:	**Operations & Algebraic Thinking (OA)** - Represent and solve problems involving multiplication and division. - Understand properties of multiplication and the relationship between multiplication and division. - Multiply and divide within 100. - Solve problems involving the four operations, and identify and explain patterns in 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(s) by the end of the year:** **3.OA.7 –** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3,

	know from memory all products of two one-digit numbers. **3.NBT.2** - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS ONE – FIVE (9/6/16 – 10/7/16)		
3.OA.1	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.	• **Understand equal groups of as multiplication.** • **Relate multiplication to the array model.** • **Interpret the meaning of factors—the size of the group or the number of groups.** • **Understand the meaning of the unknown as the size of the group in division.** • **Understand the meaning of the unknown as the number of groups in division.** • **Interpret the unknown in division using the array model.** • **Demonstrate the commutativity of multiplication and practice related facts by skip-counting objects in array models.** • **Find related multiplication facts by adding and subtracting equal groups in array models.** • **Model the distributive property with arrays to decompose units as a strategy to multiply** • **Model division as the unknown factor in multiplication using arrays and tape diagrams.** • **Interpret the quotient as the number of groups or the number of objects in each group.** • **Skip-count objects in models to build fluency with**
3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*	
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	
3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?	
3.OA.5	Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by	

	3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	**multiplication facts.** • **Relate arrays to tape diagrams to model the commutative property of multiplication.** • **Use the distributive property as a strategy to find related multiplication facts.** • **Model the relationship between multiplication and division.** • **Solve two-step word problems involving multiplication and division and assess the reasonableness of answers.** • **Solve two-step word problems involving all four operations and assess the reasonableness of answers.**
3.OA.6	Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	
3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. **(3rd Grade Fluency Standard)**	
3.OA.8	Solve two-step word problems using the four operations. 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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)	
Unpacking: What do these standards mean a child will know and be able to do?		
3.OA.1	This standard interprets products of whole numbers. Students recognize multiplication as a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group or of an equal amount of objects were added or collected numerous times.. Multiplication requires students to think in terms of groups of things rather than individual things. Students learn that the multiplication symbol 'x' means "groups of" and problems such as 5 x 7 refer to 5 groups of 7.	
3.OA.2	This standard focuses on two distinct models of division: partition models and measurement (repeated subtraction) models. Partition models provide students with a total number and the number of groups. These models focus on the question, "How many objects are	

	in each group so that the groups are equal?" A context for partition models would be: There are 12 cookies on the counter. If you are sharing the cookies equally among three bags, how many cookies will go in each bag? Measurement (repeated subtraction) models provide students with a total number and the number of objects in each group. These models focus on the question, "How many equal groups can you make?"
3.OA.3	This standard references various problem solving context and strategies that students are expected to use while solving word problems involving multiplication & division. Students should use a variety of representations for creating and solving one-step word problems, such as: If you divide 4 packs of 9 brownies among 6 people, how many cookies does each person receive? (4 x 9 = 36, 36 ÷ 6 = 6). Students should be given ample experiences to explore all of the different problem structures. A student can also reason through the problem mentally or verbally, "I know 6 and 6 are 12. 12 and 12 are 24. Therefore, there are 4 groups of 6 giving a total of 24 desks in the classroom." A number line could also be used to show equal jumps. Students in third grade should use a variety of pictures, such as stars, boxes, flowers to represent unknown numbers (variables). Letters are also introduced to represent unknowns in third grade.
3.OA.4	This standard refers to equations for the different types of multiplication and division problem structures. The easiest problem structure includes Unknown Product (3 x 6 = ? or 18 ÷ 3 = 6). The more difficult problem structures include Group Size Unknown (3 x ? = 18 or 18 ÷ 3 = 6) or Number of Groups Unknown (? x 6 = 18, 18 ÷ 6 = 3). The focus of 3.OA.4 extends beyond the traditional notion of fact families, by having students explore the inverse relationship of multiplication and division. Students extend work from lower grades with their understanding of the meaning of the equal sign as "the same amount as" to interpret an equation with an unknown. When given 4 x ? = 40, they might think: • 4 groups of some number is the same as 40 • 4 times some number is the same as 40 • I know that 4 groups of 10 is 40 so the unknown number is 10 • The missing factor is 10 because 4 times 10 equals 40. Equations in the form of a x b = c and c = a x b should be used interchangeably, with the unknown in different positions.
3.OA.5	This standard references properties (rules about how numbers work) of multiplication. This extends past previous expectations, in which students were asked to identify properties. While students DO NOT need to not use the formal terms of these properties, student must understand that properties are rules about how numbers work, and they need to be flexibly and fluently applying each of them in various situations. Students represent expressions using various objects, pictures, words and symbols in order to develop their understanding of properties. They multiply by 1 and 0 and divide by 1. They change the order of numbers to determine that the

	order of numbers does not make a difference in multiplication (but does make a difference in division). Given three factors, they investigate changing the order of how they multiply the numbers to determine that changing the order does not change the product. They also decompose numbers to build fluency with multiplication. The associative property states that the sum or product stays the same when the grouping of addends or factors is changed. For example, when a student multiplies 7 x 5 x 2, a student could rearrange the numbers to first multiply 5 x 2 = 10 and then multiply 10 x 7 = 70. The commutative property (order property) states that the order of numbers does not matter when you are adding or multiplying numbers. For example, if a student knows that 5 x 4 = 20, then they also know that 4 x 5 = 20. The array below could be described as a 5 x 4 array for 5 columns and 4 rows, or a 4 x 5 array for 4 rows and 5 columns. There is no "fixed" way to write the dimensions of an array as rows x columns or columns x rows. Students should have flexibility in being able to describe both dimensions of an array. Students are introduced to the distributive property of multiplication over addition as a strategy for using products they know to solve products they don't know. Students would be using mental math to determine a product. Here are ways that students could use the distributive property to determine the product of 7 x 6. Again, students should use the distributive property, but can refer to this in informal language such as "breaking numbers apart". To further develop understanding of properties related to multiplication and division, students use different representations and their understanding of the relationship between multiplication and division to determine if the following types of equations are true or false.
3.OA.6	This standard refers to various problem structures. Since multiplication and division are inverse operations, students are expected to solve problems and explain their processes of solving division problems that can also be represented as unknown factor multiplication problems. Multiplication and division are inverse operations and that understanding can be used to find the unknown. Fact family triangles demonstrate the inverse operations of multiplication and division by showing the two factors and how those factors relate to the product and/or quotient.
3.OA.7	This standard uses the word fluently, which means accuracy, efficiency (using a reasonable amount of steps and time), and flexibility (using strategies such as the distributive property). "Know from memory" should not focus only on timed tests and repetitive practice, but ample experiences working with manipulatives, pictures, arrays, word problems, and numbers to internalize the basic facts (up to 9 x 9). By studying patterns and relationships in multiplication facts and relating multiplication and division, students build a foundation for fluency with multiplication and division facts. Students demonstrate fluency with multiplication facts through 10 and the related division facts. Multiplying and dividing fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Strategies students may use to attain fluency include:

	• Multiplication by zeros and ones • Doubles (2s facts), Doubling twice (4s), Doubling three times (8s) • Tens facts (relating to place value, 5 x 10 is 5 tens or 50) • Five facts (half of tens) • Skip counting (counting groups of __ and knowing how many groups have been counted) • Square numbers (ex: 3 x 3) • Nines (10 groups less one group, e.g., 9 x 3 is 10 groups of 3 minus one group of 3) • Decomposing into known facts (6 x 7 is 6 x 6 plus one more group of 6) • Turn-around facts (Commutative Property) • Fact families (Ex: 6 x 4 = 24; 24 ÷ 6 = 4; 24 ÷ 4 = 6; 4 x 6 = 24) • Missing factors Students should have exposure to multiplication and division problems presented in both vertical and horizontal forms. Note that mastering this material, and reaching fluency in single-digit multiplications and related divisions with understanding, may be quite time consuming because there are no general strategies for multiplying or dividing all single-digit numbers as there are for addition and subtraction. Instead, there are many patterns and strategies dependent upon specific numbers. So it is imperative that extra time and support be provided if needed. All of the understandings of multiplication and division situations, and the various levels of representation and solving, and of patterns need to culminate by the end of Grade 3 in fluent multiplying and dividing of all single-digit numbers and 10. Such fluency may be reached by becoming fluent for each number (e.g., the 2s, the 5s, etc.) and then extending the fluency to several, then all numbers mixed together. Organizing practice so that it focuses most heavily on understood but not yet fluent products and unknown factors can speed learning. To achieve this by the end of Grade 3, students must begin working toward fluency for the easy numbers as early as possible. Because an unknown factor (a division) can be found from the related multiplication, the emphasis at the end of the year is on knowing from memory all products of two one-digit numbers. As should be clear from the foregoing, this isn't a matter of instilling facts divorced from their meanings, but rather the outcome of a carefully designed learning process that heavily involves the interplay of practice and reasoning. All of the work on how different numbers fit with the base-ten numbers culminates in these "just know" products and is necessary for learning products. Fluent dividing for all single-digit numbers, which will combine just knows, knowing from a multiplication, patterns, and best strategy, is also part of this vital standard.

Third Grade Mathematics Planning Map
SY 2016-2017

3.OA.8	Students in third grade begin the step to formal algebraic language by using a letter for the unknown quantity in expressions or equations for one and two-step problems. But the symbols of arithmetic, x or * for multiplication and ÷ or / for division, continue to be used in Grades 3, 4, and 5. This standard refers to two-step word problems using the four operations. The size of the numbers should be limited to related 3rd grade standards (e.g., 3.OA.7 and 3.NBT.2). Adding and subtracting numbers should include numbers within 1,000, and multiplying and dividing numbers should include single-digit factors and products less than 100. This standard calls for students to represent problems using equations with a letter to represent unknown quantities.

Third Grade Mathematics	**Quarter 1 – Unit 2**
Common Core Domains and Clusters:	**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 estimation of intervals of time, liquid volumes, and masses of objects.
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(s) by the end of the year:**

	3.OA.7 – Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers**.** **3.NBT.2** - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS SIX – NINE (10/11/16 – 11/3/16)		
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.	• **Explore time as a continuous measurement using a stopwatch.** • **Relate skip-counting by 5 on the clock and telling time to a continuous measurement model, the number line.** • **Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.** • **Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.** • **Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.** • **Build and decompose a kilogram to reason about the size and weight of 1 kilogram, 100 grams, 10 grams, and 1 gram.** • **Develop estimation strategies by reasoning about the weight in kilograms of a series of familiar objects to establish mental benchmark measures.** • **Solve one-step word problems involving metric weights within 100 and estimate to reason about solutions.** • **Decompose a liter to reason about the size of 1 liter, 100 milliliters, 10 milliliters, and 1 milliliter.**
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **(3rd Grade Fluency Standard)**	
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	

		• **Estimate and measure liquid volume in liters and milliliters using the vertical number line.** • **Solve mixed word problems involving all four operations with grams, kilograms, liters, and milliliters given in the same units.** • **Round two-digit measurements to the nearest ten on the vertical number line.** • **Round two- and three-digit numbers to the nearest ten on the vertical number line.** • **Round to the nearest hundred on the vertical number line.** • **Add measurements using the standard algorithm to compose larger units once.** • **Add measurements using the standard algorithm to compose larger units twice.** • **Estimate sums by rounding and apply to solve measurement word problems.** • **Decompose once to subtract measurements including three-digit minuends with zeros in the tens or ones place.** • **Decompose twice to subtract measurements including three-digit minuends with zeros in the tens and ones places.** • **Estimate differences by rounding and apply to solve measurement word problems.** • **Estimate sums and differences of measurements by rounding, and then solve mixed word problems.**
Unpacking: What do these standards mean a child will know and be able to do?		
3.NBT.1	This standard refers to place value understanding, which extends beyond an algorithm or memorized 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.	

3.NBT.2	This standard refers to fluently, which means accuracy, efficiency (using a reasonable amount of steps and time), and flexibility (using strategies such as the distributive property). The word algorithm refers to a procedure or a series of steps. There are other algorithms other than the standard algorithm. Third grade students should have experiences beyond the standard algorithm. Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties. Students explain their thinking and show their work by using strategies and algorithms, and verify that their answer is reasonable. 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.
3.MD.1	This standard calls for students to solve elapsed time, including word problems. Students could use clock models or number lines to solve. On the number line, students should be given the opportunities to determine the intervals and size of jumps on their number line. Students could use pre-determined number lines (intervals every 5 or 15 minutes) or open number lines (intervals determined by students).
3.MD.2	This standard asks for students to reason about the units of mass and volume using units g, kg, and L. Students need multiple opportunities weighing classroom objects and filling containers to help them develop a basic understanding of the size and weight of a liter, a gram, and a kilogram. Milliliters may also be used to show amounts that are less than a liter emphasizing the relationship between smaller units to larger units in the same system. Word problems should only be one-step and include the same units. Students are not expected to do conversions between units, but reason as they estimate, using benchmarks to measure weight and capacity. Foundational understandings to help with measure concepts: Understand that larger units can be subdivided into equivalent units (partition). Understand that the same unit can be repeated to determine the measure (iteration). Understand the relationship between the size of a unit and the number of units needed (compensatory principal). Before learning to measure attributes, children need to recognize them, distinguishing them from other attributes. That is, the attribute to be measured has to “stand out” for the student and be discriminated from the undifferentiated sense of amount that young children often have, labeling greater lengths, areas, volumes, and so forth, as “big” or “bigger.” These standards do not differentiate between weight and mass. Technically, mass is the amount of matter in an object. Weight is the force exerted on the body by gravity. On the earth’s surface, the distinction is not important (on the moon, an object would have the same mass, would weigh less due to the lower gravity).

Third Grade Mathematics Planning Map
SY 2016-2017

Suggested Instructional Timeline: Quarter 2			
Unit 1		11/7/16 – 12/23/16 (6 WEEKS)	
Unit 2		1/9/17 – 2/2/17 (4 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Third Grade Mathematics	**Quarter 2 – Unit 1**
Common Core Domains and Clusters:	**Operations & Algebraic Thinking (OA)** - Represent and solve problems involving multiplication and division. - Understand properties of multiplication and the relationship between multiplication and division. - Multiply and divide within 100. - Solve problems involving the four operations, and identify and explain patterns in arithmetic. **Numbers & Operations in Base Ten (NBT)** - Use place value understanding and properties of operations to perform multi-digit arithmetic. (A range of algorithms may be used.)
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**

Third Grade Mathematics Planning Map
SY 2016-2017

Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard(s) by the end of the year:** **3.OA.7 –** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers**.** **3.NBT.2** - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE – SIX (11/7/16 – 12/23/16)		
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	• **Study commutativity to find known facts of 6, 7, 8, and 9.** • **Apply the distributive and commutative properties to relate multiplication facts 5 × n + n to 6 × n and n × 6 where n is the size of the unit.** • **Multiply and divide with familiar facts using a letter to represent the unknown.** • **Use the distributive property as a strategy to multiply and divide.** • **Interpret the unknown in multiplication and division to model and solve problems.** • **Understand the function of parentheses and apply to solving problems.** • **Model the associative property as a strategy to multiply.** • **Use the distributive property as a strategy to multiply and divide.** • **Interpret the unknown in multiplication and division to**
3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?.	
3.OA.5	Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	

3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. **(3rd Grade Fluency Standard)**	**model and solve problems.** • **Apply the distributive property and the fact 9 = 10 – 1 as a strategy to multiply.** • **Identify and use arithmetic patterns to multiply.** • **Interpret the unknown in multiplication and division to model and solve problems.** • **Reason about and explain arithmetic patterns using units of 0 and 1 as they relate to multiplication and division.** • **Identify patterns in multiplication and division facts using the multiplication table.** • **Solve two-step word problems involving all four operations and assess the reasonableness of solutions.** • **Multiply by multiples of 10 using the place value chart.** • **Use place value strategies and the associative property** • **n × (m × 10) = (n × m) × 10 (where n and m are less than 10) to multiply by multiples of 10.** • **Solve two-step word problems involving multiplying single-digit factors and multiples of 10.**
3.OA.8	Solve two-step word problems using the four operations. 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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)	
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	
3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	

Unpacking: What do these standards mean a child will know and be able to do?

3.OA.3	This standard references various problem solving context and strategies that students are expected to use while solving word problems involving multiplication & division. Students should use a variety of representations for creating and solving one-step word problems, such as: If you divide 4 packs of 9 brownies among 6 people, how many cookies does each person receive? (4 x 9 = 36, 36 ÷ 6 = 6). Students should be given ample experiences to explore all of the different problem structures. A student can also reason

	through the problem mentally or verbally, "I know 6 and 6 are 12. 12 and 12 are 24. Therefore, there are 4 groups of 6 giving a total of 24 desks in the classroom." A number line could also be used to show equal jumps. Students in third grade should use a variety of pictures, such as stars, boxes, flowers to represent unknown numbers (variables). Letters are also introduced to represent unknowns in third grade.
3.OA.4	This standard refers to equations for the different types of multiplication and division problem structures. The easiest problem structure includes Unknown Product (3 x 6 = ? or 18 ÷ 3 = 6). The more difficult problem structures include Group Size Unknown (3 x ? = 18 or 18 ÷ 3 = 6) or Number of Groups Unknown (? x 6 = 18, 18 ÷ 6 = 3). The focus of 3.OA.4 extends beyond the traditional notion of fact families, by having students explore the inverse relationship of multiplication and division. Students extend work from lower grades with their understanding of the meaning of the equal sign as "the same amount as" to interpret an equation with an unknown. When given 4 x ? = 40, they might think: • 4 groups of some number is the same as 40 • 4 times some number is the same as 40 • I know that 4 groups of 10 is 40 so the unknown number is 10 • The missing factor is 10 because 4 times 10 equals 40. Equations in the form of a x b = c and c = a x b should be used interchangeably, with the unknown in different positions.
3.OA.5	This standard references properties (rules about how numbers work) of multiplication. This extends past previous expectations, in which students were asked to identify properties. While students DO NOT need to not use the formal terms of these properties, student must understand that properties are rules about how numbers work, and they need to be flexibly and fluently applying each of them in various situations. Students represent expressions using various objects, pictures, words and symbols in order to develop their understanding of properties. They multiply by 1 and 0 and divide by 1. They change the order of numbers to determine that the order of numbers does not make a difference in multiplication (but does make a difference in division). Given three factors, they investigate changing the order of how they multiply the numbers to determine that changing the order does not change the product. They also decompose numbers to build fluency with multiplication. The associative property states that the sum or product stays the same when the grouping of addends or factors is changed. For example, when a student multiplies 7 x 5 x 2, a student could rearrange the numbers to first multiply 5 x 2 = 10 and then multiply 10 x 7 = 70. The commutative property (order property) states that the order of numbers does not matter when you are adding or multiplying numbers. For example, if a student knows that 5 x 4 = 20, then they also know that 4 x 5 = 20. The array below could be described as a 5 x 4 array for 5 columns and 4 rows, or a 4 x 5 array for 4 rows and 5 columns. There is no "fixed" way to write the dimensions of an array as rows x columns or columns x rows. Students should have

	flexibility in being able to describe both dimensions of an array. Students are introduced to the distributive property of multiplication over addition as a strategy for using products they know to solve products they don't know. Students would be using mental math to determine a product. Here are ways that students could use the distributive property to determine the product of 7 x 6. Again, students should use the distributive property, but can refer to this in informal language such as "breaking numbers apart". To further develop understanding of properties related to multiplication and division, students use different representations and their understanding of the relationship between multiplication and division to determine if the following types of equations are true or false.
3.OA.7	This standard uses the word fluently, which means accuracy, efficiency (using a reasonable amount of steps and time), and flexibility (using strategies such as the distributive property). "Know from memory" should not focus only on timed tests and repetitive practice, but ample experiences working with manipulatives, pictures, arrays, word problems, and numbers to internalize the basic facts (up to 9 x 9). By studying patterns and relationships in multiplication facts and relating multiplication and division, students build a foundation for fluency with multiplication and division facts. Students demonstrate fluency with multiplication facts through 10 and the related division facts. Multiplying and dividing fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Strategies students may use to attain fluency include: • Multiplication by zeros and ones • Doubles (2s facts), Doubling twice (4s), Doubling three times (8s) • Tens facts (relating to place value, 5 x 10 is 5 tens or 50) • Five facts (half of tens) • Skip counting (counting groups of __ and knowing how many groups have been counted) • Square numbers (ex: 3 x 3) • Nines (10 groups less one group, e.g., 9 x 3 is 10 groups of 3 minus one group of 3) • Decomposing into known facts (6 x 7 is 6 x 6 plus one more group of 6) • Turn-around facts (Commutative Property) • Fact families (Ex: 6 x 4 = 24; 24 ÷ 6 = 4; 24 ÷ 4 = 6; 4 x 6 = 24) • Missing factors Students should have exposure to multiplication and division problems presented in both vertical and horizontal forms. Note that mastering this material, and reaching fluency in single-digit multiplications and related divisions with understanding, may be quite time consuming because there are no general strategies for multiplying or dividing all single-digit numbers as there are for addition

	and subtraction. Instead, there are many patterns and strategies dependent upon specific numbers. So it is imperative that extra time and support be provided if needed. All of the understandings of multiplication and division situations, and the various levels of representation and solving, and of patterns need to culminate by the end of Grade 3 in fluent multiplying and dividing of all single-digit numbers and 10. Such fluency may be reached by becoming fluent for each number (e.g., the 2s, the 5s, etc.) and then extending the fluency to several, then all numbers mixed together. Organizing practice so that it focuses most heavily on understood but not yet fluent products and unknown factors can speed learning. To achieve this by the end of Grade 3, students must begin working toward fluency for the easy numbers as early as possible. Because an unknown factor (a division) can be found from the related multiplication, the emphasis at the end of the year is on knowing from memory all products of two one-digit numbers. As should be clear from the foregoing, this isn't a matter of instilling facts divorced from their meanings, but rather the outcome of a carefully designed learning process that heavily involves the interplay of practice and reasoning. All of the work on how different numbers fit with the base-ten numbers culminates in these "just know" products and is necessary for learning products. Fluent dividing for all single-digit numbers, which will combine just knows, knowing from a multiplication, patterns, and best strategy, is also part of this vital standard.
3.OA.8	Students in third grade begin the step to formal algebraic language by using a letter for the unknown quantity in expressions or equations for one and two-step problems. But the symbols of arithmetic, x or * for multiplication and ÷ or / for division, continue to be used in Grades 3, 4, and 5. This standard refers to two-step word problems using the four operations. The size of the numbers should be limited to related 3rd grade standards (e.g., 3.OA.7 and 3.NBT.2). Adding and subtracting numbers should include numbers within 1,000, and multiplying and dividing numbers should include single-digit factors and products less than 100. This standard calls for students to represent problems using equations with a letter to represent unknown quantities.
3.OA.9	This standard calls for students to examine arithmetic patterns involving both addition and multiplication. Arithmetic patterns are patterns that change by the same rate, such as adding the same number. For example, the series 2, 4, 6, 8, 10 is an arithmetic pattern that increases by 2 between each term. This standards also mentions identifying patterns related to the properties of operations. Examples: • Even numbers are always divisible by 2. Even numbers can always be decomposed into 2 equal addends (14 = 7 + 7). • Multiples of even numbers (2, 4, 6, and 8) are always even numbers. • On a multiplication chart, the products in each row and column increase by the same amount (skip counting).

	• On an addition chart, the sums in each row and column increase by the same amount. Students need ample opportunities to observe and identify important numerical patterns related to operations. They should build on their previous experiences with properties related to addition and subtraction. Students investigate addition and multiplication tables in search of patterns and explain why these patterns make sense mathematically. Example: • Any sum of two even numbers is even. • Any sum of two odd numbers is even. • Any sum of an even number and an odd number is odd. • The multiples of 4, 6, 8, and 10 are all even because they can all be decomposed into two equal groups. • The doubles (2 addends the same) in an addition table fall on a diagonal while the doubles (multiples of 2) in a multiplication table fall on horizontal and vertical lines. • The multiples of any number fall on a horizontal and a vertical line due to the commutative property. • All the multiples of 5 end in a 0 or 5 while all the multiples of 10 end with 0. Every other multiple of 5 is a multiple of 10.
3.NBT.3	This standard extends students' work in multiplication by having them apply their understanding of place value. This standard expects that students go beyond tricks that hinder understanding such as "just adding zeros" and explain and reason about their products. For example, for the problem 50 x 4, students should think of this as 4 groups of 5 tens or 20 tens, and that twenty tens equals 200. The special role of 10 in the base-ten system is important in understanding multiplication of one-digit numbers with multiples of 10. For example, the product 3 x 50 can be represented as 3 groups of 5 tens, which is 15 tens, which is 150. This reasoning relies on the associative property of multiplication: 3 x 50 = 3 x (5 x 10) = (3 x 5) x 10 = 15 x10 = 150. It is an example of how to explain an instance of a calculation pattern for these products: calculate the product of the non-zero digits, and then shift the product one place to the left to make the result ten times as large

Third Grade Mathematics	**Quarter 2 – Unit 2**
Common Core Domains and Clusters:	**Measurement & Data (MD)** - Geometric Measurement: understand concepts of area and relate area to multiplication and to addition.
Standards for Mathematical Practice	**The following highlighted practices are the minimally required practices students must demonstrate throughout the instructional unit:**

(SMP):	**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(s) by the end of the year:** **3.OA.7 –** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers**.** **3.NBT.2** - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS SEVEN – TEN (1/9/17 – 2/2/17)		
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement: a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.	• **Understand area as an attribute of plane figures.** • **Decompose and recompose shapes to compare areas.** • **Model tiling with centimeter and inch unit squares as a strategy to measure area.** • **Relate side lengths with the number of tiles on a side.** • **Form rectangles by tiling with unit squares to make arrays.**

3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	• **Draw rows and columns to determine the area of a rectangle, given an incomplete array.** • **Interpret area models to form rectangular arrays.** • **Find the area of a rectangle through multiplication of the side lengths** • **Analyze different rectangles and reason about their area.** • **Apply the distributive property as a strategy to find the total area of a large rectangle by adding two products.** • **Demonstrate the possible whole number side lengths of rectangles with areas of 24, 36, 48, or 72 square units using the associative property** • **Solve word problems involving area.** • **Find areas by decomposing into rectangles or completing composite figures to form rectangles.**
3.MD.7	Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.	

Unpacking: What do these standards mean a child will know and be able to do?

3.MD.5	These standards call for students to explore the concept of covering a region with "unit squares," which could include square tiles or shading on grid or graph paper. Based on students' development, they should have ample experiences filling a region with square tiles before transitioning to pictorial representations on graph paper.
3.MD.6	Students should be counting the square units to find the area could be done in metric, customary, or non-standard square units. Using different sized graph paper, students can explore the areas measured in square centimeters and square inches.
3.MD.7	Students can learn how to multiply length measurements to find the area of a rectangular region. But, in order that they make sense of these quantities, they must first learn to interpret measurement of rectangular regions as a multiplicative relationship of the number of square units in a row and the number of rows. This relies on the development of spatial structuring. To build from spatial structuring to understanding the number of area-units as the product of number of units in a row and number of rows, students might draw rectangular arrays of squares and learn to determine the number of squares in each row with increasingly sophisticated strategies, such as skip-counting the number in each row and eventually multiplying the number in

	each row by the number of rows. They learn to partition a rectangle into identical squares by anticipating the final structure and forming the array by drawing line segments to form rows and columns. They use skip counting and multiplication to determine the number of squares in the array. Students should solve real world and mathematical problems. Students might solve problems such as finding all the rectangular regions with whole-number side lengths that have an area of 12 area-units, doing this for larger rectangles (e.g., enclosing 24, 48, 72 area-units), making sketches rather than drawing each square. Students learn to justify their belief they have found all possible solutions. Using concrete objects or drawings students build competence with composition and decomposition of shapes, spatial structuring, and addition of area measurements, students learn to investigate arithmetic properties using area models. For example, they learn to rotate rectangular arrays physically and mentally, understanding that their areas are preserved under rotation, and thus, for example, 4 x 7 = 7 x 4, illustrating the commutative property of multiplication. Students also learn to understand and explain that the area of a rectangular region of, for example, 12 length-units by 5 length-units can be found either by multiplying 12 x 5, or by adding two products, e.g., 10 x5 and 2 x 5, illustrating the distributive property. This standard uses the word rectilinear. A rectilinear figure is a polygon that has all right angles. With strong and distinct concepts of both perimeter and area established, students can work on problems to differentiate their measures. For example, they can find and sketch rectangles with the same perimeter and different areas or with the same area and different perimeters and justify their claims Differentiating perimeter from area is facilitated by having students draw congruent rectangles and measure, mark off, and label the unit lengths all around the perimeter on one rectangle, then do the same on the other rectangle but also draw the square units. This enables students to see the units involved in length and area and find patterns in finding the lengths and areas of non-square and square rectangles. Students can continue to describe and show the units involved in perimeter and area after they no longer need these.

Third Grade Mathematics Planning Map
SY 2016-2017

Suggested Instructional Timeline: Quarter 3			
Unit 1		2/6/17 – 4/6/17 (9 WEEKS)	
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Third Grade Mathematics	**Quarter 3 – Unit 1**
Common Core Domains and Clusters:	**Numbers & Operations - Fractions (NF)** - Develop understanding of fractions as numbers. **Geometry (G)** - Reason with shapes and their attributes.
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(s) by the end of the year:** **3.OA.7 –** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers**.**

	3.NBT.2 - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS ONE – NINE (2/6/17 – 4/6/17)		
3.NF.1	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	• **Specify and partition a whole into equal parts, identifying and counting unit fractions using concrete models.** • **Specify and partition a whole into equal parts, identifying and counting unit fractions by folding fraction strips.** • **Specify and partition a whole into equal parts, identifying and counting unit fractions by drawing pictorial area models.** • **Represent and identify fractional parts of different wholes.** • **Partition a whole into equal parts and define the equal parts to identify the unit fraction numerically.** • **Build non-unit fractions less than one whole from unit fractions.** • **Identify and represent shaded and non-shaded parts of one whole as fractions.** • **Represent parts of one whole as fractions with number bonds.** • **Build and write fractions greater than one whole using unit fractions.** • **Compare unit fractions by reasoning about their size**
3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	
3.NF.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the	

	same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form of 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	**using fraction strips.** • **Compare unit fractions with different sized models representing the whole.** • **Specify the corresponding whole when presented with one equal part.** • **Identify a shaded fractional part in different ways depending on the designation of the whole.** • **Place unit fractions on a number line with endpoints 0 and 1.** • **Place any fraction on a number line with endpoints 0 and 1.** • **Place whole number fractions and unit fractions between whole numbers on the number line.** • **Practice placing various fractions on the number line.** • **Compare fractions and whole numbers on the number line by reasoning about their distance from 0.** • **Understand distance and position on the number line as strategies for comparing fractions.** • **Recognize and show that equivalent fractions have the same size, though not necessarily the same shape.** • **Recognize and show that equivalent fractions refer to the same point on the number line.** • **Generate simple equivalent fractions by using visual fraction models and the number line.** • **Express whole numbers as fractions and recognize equivalence with different units.** • **Express whole number fractions on the number line when the unit interval is 1.**
3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area and describe the area of each part as 1/4 of the area of the shape.	

		• **Decompose whole number fractions greater than 1 using whole number equivalence with various models.** • **Explain equivalence by manipulating units and reasoning about their size.** • **Compare fractions with the same numerator pictorially.** • **Compare fractions with the same numerator using <, >, or = and use a model to reason about their size.** • **Partition various wholes precisely into equal parts using a number line method.**

Unpacking: What do these standards mean a child will know and be able to do?

3.NF.1	This standard refers to the sharing of a whole being partitioned. Fraction models in third grade include only area (parts of a whole) models (circles, rectangles, squares) and number lines. Set models (parts of a group) are not addressed in Third Grade. In 3.NF.1 students start with unit fractions (fractions with numerator 1), which are formed by partitioning a whole into equal parts and reasoning about one part of the whole, e.g., if a whole is partitioned into 4 equal parts then each part is . of the whole, and 4 copies of that part make the whole. Next, students build fractions from unit fractions, seeing the numerator 3 of . as saying that . is the quantity you get by putting 3 of the .'s together. There is no need to introduce "improper fractions" initially. Some important concepts related to developing understanding of fractions include: • Understand fractional parts must be equal-sized. • The number of equal parts tell how many make a whole. • As the number of equal pieces in the whole increases, the size of the fractional pieces decreases. • The size of the fractional part is relative to the whole. • One-half of a small pizza is relatively smaller than one-half of a large pizza. • When a whole is cut into equal parts, the denominator represents the number of equal parts. • The numerator of a fraction is the count of the number of equal parts. •Students can count one fourth, two fourths, three fourths. Students express fractions as fair sharing or, parts of a whole. They use various contexts (candy bars, fruit, and cakes) and a variety of models (circles, squares, rectangles, fraction bars, and number lines) to develop understanding of fractions and represent fractions.

	Students need many opportunities to solve word problems that require them to create and reason about fair share. Initially, students can use an intuitive notion of "same size and same shape" (congruence) to explain why the parts are equal, e.g., when they divide a square into four equal squares or four equal rectangles. Students come to understand a more precise meaning for "equal parts" as "parts with equal measurements." For example, when a ruler is partitioned into halves or quarters of an inch, they see that each subdivision has the same length. In area models they reason about the area of a shaded region to decide what fraction of the whole it represents.
3.NF.2	The number line diagram is the first time students work with a number line for numbers that are between whole numbers (e.g., that . is between 0 and 1). Students need ample experiences folding linear models (e.g., string, sentence strips) to help them reason about and justify the location of fractions that lies exactly halfway between 0 and 1. In the number line diagram below, the space between 0 and 1 is divided (partitioned) into 4 equal regions. The distance from 0 to the first segment is 1 of the 4 segments from 0 to 1 or . (3.NF.2a). Similarly, the distance from 0 to the third segment is 3 segments that are each one-fourth long. Therefore, the distance of 3 segments from 0 is the fraction . (3.NF.2b).
3.NF.3	An important concept when comparing fractions is to look at the size of the parts and the number of the parts. 3.NF.3a and 3.NF.3b These standards call for students to use visual fraction models (area models) and number lines to explore the idea of equivalent fractions. Students should only explore equivalent fractions using models, rather than using algorithms or procedures. This standard includes writing whole numbers as fractions. The concept relates to fractions as division problems, where the fraction 3/1 is 3 wholes divided into one group. This standard is the building block for later work where students divide a set of objects into a specific number of groups. Students must understand the meaning of a/1. This standard involves comparing fractions with or without visual fraction models including number lines. In this standard, students should also reason that comparisons are only valid if the wholes are identical. Previously, in second grade, students compared lengths using a standard measurement unit. In third grade they build on this idea to compare fractions with the same denominator. They see that for fractions that have the same denominator, the underlying unit fractions are the same size, so the fraction with the greater numerator is greater because it is made of more unit fractions. Students also see that for unit fractions, the one with the larger denominator is smaller, by reasoning, for example, that in order for more (identical) pieces to make the same whole, the pieces must be smaller. From this they reason that for fractions that have the same numerator, the fraction with the smaller denominator is greater.
3.G.2	In second grade, students identify and draw triangles, quadrilaterals, pentagons, and hexagons. Third graders build on this experience and further investigate quadrilaterals (technology may be used during this exploration). Students recognize shapes that are and are not quadrilaterals by examining the properties of the geometric figures. They conceptualize that a quadrilateral must be a closed

	figure with four straight sides and begin to notice characteristics of the angles and the relationship between opposite sides. Students should be encouraged to provide details and use proper vocabulary when describing the properties of quadrilaterals. They sort geometric figures and identify squares, rectangles, and rhombuses as quadrilaterals. Fourth grade students have built a firm foundation of several shape categories, these categories can be the raw material for thinking about the relationships between classes. Students should classify shapes by attributes and drawing shapes that fit specific categories. Example: students can form larger, categories, such as the class of all shapes with four sides, or quadrilaterals, and recognize that it includes other categories, such as squares, rectangles, rhombuses, parallelograms, and trapezoids. They also recognize that there are quadrilaterals that are not in any of those subcategories. Parallelograms include: squares, rectangles, rhombi, or other shapes that have two pairs of parallel sides. Also, the broad category quadrilaterals include all types of parallelograms, trapezoids and other four-sided figures. Example: Draw a picture of a quadrilateral. Draw a picture of a rhombus. How are they alike? How are they different? Is a quadrilateral a rhombus? Is a rhombus a quadrilateral? Justify your thinking. A kite is a quadrilateral whose four sides can be grouped into two pairs of equal-length sides that are beside each other. The notion of congruence (“same size and same shape”) may be part of classroom conversation but the concepts of congruence and similarity do not appear until middle school.

Third Grade Mathematics Planning Map
SY 2016-2017

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**

Third Grade Mathematics	**Quarter 4 – Unit 1**
Common Core Domains and Clusters:	**Operations & Algebraic Thinking (OA)** - Solve problems involving the four operations, and identify and explain patterns in arithmetic. **Measurement & Data (MD)** - Represent and interpret data. - Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. **Geometry (G)** - Reason with shapes and their attributes.
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**

Third Grade Mathematics Planning Map
SY 2016-2017

Fluency Standard(s):	**Students must fluently demonstrate mastery within the following standard(s) by the end of the year:** **3.OA.7 –** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers**.** **3.NBT.2** - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE – FIVE (4/17/17 – 5/19/17)		
3.OA.8	Solve two-step word problems using the four operations. 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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order [Order of Operations].)	• **Solve word problems in varied contexts using a letter to represent the unknown.** • **Share and critique peer solution strategies to varied word problems** • **Compare and classify quadrilaterals.** • **Compare and classify other polygons.** • **Draw polygons with specified attributes to solve problems.** • **Create a tangram puzzle and observe relationships among the shapes.** • **Reason about composing and decomposing polygons using tangrams.** • **Decompose quadrilaterals to understand perimeter as the boundary of a shape.** • **Tessellate to understand perimeter as the boundary of a shape.** • **Measure side lengths in whole number units to determine the perimeter of polygons.** • **Explore perimeter as an attribute of plane figures and solve**
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.	
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and	

	exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	**problems.** • **Determine the perimeter of regular polygons and rectangles when whole number measurements are missing.** • **Solve word problems to determine perimeter with given side lengths.** • **Use string to measure the perimeter of various circles to the nearest quarter inch.** • **Use all four operations to solve problems involving perimeter and missing measurements** • **Construct rectangles from a given number of unit squares and determine the perimeters.** • **Use a line plot to record the number of rectangles constructed from a given number of unit squares.** • **Construct rectangles with a given perimeter using unit squares and determine their areas.** • **Use a line plot to record the number of rectangles constructed in Lessons 20 and 21.** • **Solve a variety of word problems with perimeter.** • **Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.** • **Solve a variety of word problems involving area and perimeter using all four operations.** • **Share and critique peer strategies for problem solving.**
3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	
Unpacking: What do these standards mean a child will know and be able to do?		
3.OA.8	Students in third grade begin the step to formal algebraic language by using a letter for the unknown quantity in expressions or equations for one and two-step problems. But the symbols of arithmetic, x or * for multiplication and ÷ or / for division, continue to be used in Grades 3, 4, and 5. This standard refers to two-step word problems using the four operations. The size of the numbers	

	should be limited to related 3rd grade standards (e.g., 3.OA.7 and 3.NBT.2). Adding and subtracting numbers should include numbers within 1,000, and multiplying and dividing numbers should include single-digit factors and products less than 100. This standard calls for students to represent problems using equations with a letter to represent unknown quantities.
3.MD.4	Students in second grade measured length in whole units using both metric and U.S. customary systems. It's important to review with students how to read and use a standard ruler including details about halves and quarter marks on the ruler. Students should connect their understanding of fractions to measuring to one-half and one quarter inch. Third graders need many opportunities measuring the length of various objects in their environment. This standard provides a context for students to work with fractions by measuring objects to a quarter of an inch. In Grade 3, students are beginning to learn fraction concepts (3.NF). They understand fraction equivalence in simple cases, and they use visual fraction models to represent and order fractions. Grade 3 students also measure lengths using rulers marked with halves and fourths of an inch. They use their developing knowledge of fractions and number lines to extend their work from the previous grade by working with measurement data involving fractional measurement values.
3.MD.8	Students develop an understanding of the concept of perimeter through various experiences, such as walking around the perimeter of a room, using rubber bands to represent the perimeter of a plane figure on a geoboard, or tracing around a shape on an interactive whiteboard. They find the perimeter of objects; use addition to find perimeters; and recognize the patterns that exist when finding the sum of the lengths and widths of rectangles. Students should also strategically use tools, such as geoboards, tiles, and graph paper to find all the possible rectangles that have a given perimeter (e.g., find the rectangles with a perimeter of 14 cm.) They record all the possibilities using dot or graph paper, compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles. Following this experience, students can reason about connections between their representations, side lengths, and the perimeter of the rectangles. Given a perimeter and a length or width, students use objects or pictures to find the missing length or width. They justify and communicate their solutions using words, diagrams, pictures, numbers, and an interactive whiteboard. Students use geoboards, tiles, graph paper, or technology to find all the possible rectangles with a given area (e.g. find the rectangles that have an area of 12 square units.) They record all the possibilities using dot or graph paper, compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles. Students then investigate the perimeter of the rectangles with an area of 12. The patterns in the chart allow the students to identify the factors of 12, connect the results to the commutative property, and discuss the differences in perimeter within the same area. This chart can also be used to investigate rectangles with the same perimeter. It is important to include squares in the investigation. A perimeter is the boundary of a two-dimensional shape. For a polygon, the length of the perimeter is the sum of the lengths of the sides. Initially, it is useful to have sides marked with unit length marks, allowing students to count the unit lengths. Later, the lengths of the sides can be labeled with

	numerals. As with all length tasks, students need to count the length-units and not the end-points. Next, students learn to mark off unit lengths with a ruler and label the length of each side of the polygon. For rectangles, parallelograms, and regular polygons, students can discuss and justify faster ways to find the perimeter length than just adding all of the lengths. Rectangles and parallelograms have opposite sides of equal length, so students can double the lengths of adjacent sides and add those numbers or add lengths of two adjacent sides and double that number. A regular polygon has all sides of equal length, so its perimeter length is the product of one side length and the number of sides. Perimeter problems for rectangles and parallelograms often give only the lengths of two adjacent sides or only show numbers for these sides in a drawing of the shape. The common error is to add just those two numbers. Having students first label the lengths of the other two sides as a reminder is helpful. Students then find unknown side lengths in more difficult "missing measurements" problems and other types of perimeter problems.
3.G.1	In second grade, students identify and draw triangles, quadrilaterals, pentagons, and hexagons. Third graders build on this experience and further investigate quadrilaterals (technology may be used during this exploration). Students recognize shapes that are and are not quadrilaterals by examining the properties of the geometric figures. They conceptualize that a quadrilateral must be a closed figure with four straight sides and begin to notice characteristics of the angles and the relationship between opposite sides. Students should be encouraged to provide details and use proper vocabulary when describing the properties of quadrilaterals. They sort geometric figures and identify squares, rectangles, and rhombuses as quadrilaterals. Fourth grade students have built a firm foundation of several shape categories, these categories can be the raw material for thinking about the relationships between classes. Students should classify shapes by attributes and drawing shapes that fit specific categories. Example: students can form larger, categories, such as the class of all shapes with four sides, or quadrilaterals, and recognize that it includes other categories, such as squares, rectangles, rhombuses, parallelograms, and trapezoids. They also recognize that there are quadrilaterals that are not in any of those subcategories. Parallelograms include: squares, rectangles, rhombi, or other shapes that have two pairs of parallel sides. Also, the broad category quadrilaterals include all types of parallelograms, trapezoids and other four-sided figures. Example: Draw a picture of a quadrilateral. Draw a picture of a rhombus. How are they alike? How are they different? Is a quadrilateral a rhombus? Is a rhombus a quadrilateral? Justify your thinking. A kite is a quadrilateral whose four sides can be grouped into two pairs of equal-length sides that are beside each other. The notion of congruence ("same size and same shape") may be part of classroom conversation but the concepts of congruence and similarity do not appear until middle school.

Third Grade Mathematics	Quarter 4 – Unit 2
Common Core Domains and Clusters:	**Measurement & Data (MD** - Represent and interpret data. **Operations & Algebraic Thinking (OA)** - Solve problems involving the four operations, and identify and explain patterns in arithmetic. **Measurement & Data (MD)** - Represent and interpret data. - Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. **Geometry (G)** - Reason with shapes and their attributes.
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(s) by the end of the year:** **3.OA.7 –** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By

	the end of Grade 3, know from memory all products of two one-digit numbers**.** **3.NBT.2** - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS SIX – NINE (5/22/17 – 6/16/17)		
3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	• **Generate and organize data.** • **Rotate tape diagrams vertically.** • **Create scaled bar graphs.** • **Solve one- and two-step problems involving graphs**. • **Create ruler with 1-inch, 1/2-inch, and 1/4-inch intervals and generate measurement data.** • **Interpret measurement data from various line plots.** • **Represent measurement data with line plots.** • **Analyze data to problem solve.**
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.	
Unpacking: What do these standards mean a child will know and be able to do?		
3.MD.3	Students should have opportunities reading and solving problems using scaled graphs before being asked to draw one. Work with scaled graphs builds on students' understanding of multiplication and division. The following graphs provided below all use five as the scale interval, but students should experience different intervals to further develop their understanding of scale graphs and number facts. While exploring data concepts, students should Pose a question, Collect data, Analyze data, and Interpret data. Students should be graphing data that is relevant to their lives. Pictographs: Scaled pictographs include symbols that represent multiple units. Graphs should include a title, categories, category label, key, and data. Single Bar Graphs: Students use both horizontal and vertical bar graphs. Bar graphs include a title, scale, scale label, categories, category label, and data. Analyze and Interpret data: • How many more nonfiction books where read than fantasy books? • Did more people read biography and mystery books or fiction and fantasy books?	

	• About how many books in all genres were read? • Using the data from the graphs, what type of book was read more often than a mystery but less often than a fairytale? • What interval was used for this scale? • What can we say about types of books read? What is a typical type of book read? (beyond standard) • If you were to purchase a book for the class library which would be the best genre? Why? (beyond standard)
3.MD.4	Students in second grade measured length in whole units using both metric and U.S. customary systems. It's important to review with students how to read and use a standard ruler including details about halves and quarter marks on the ruler. Students should connect their understanding of fractions to measuring to one-half and one quarter inch. Third graders need many opportunities measuring the length of various objects in their environment. This standard provides a context for students to work with fractions by measuring objects to a quarter of an inch. In Grade 3, students are beginning to learn fraction concepts (3.NF). They understand fraction equivalence in simple cases, and they use visual fraction models to represent and order fractions. Grade 3 students also measure lengths using rulers marked with halves and fourths of an inch. They use their developing knowledge of fractions and number lines to extend their work from the previous grade by working with measurement data involving fractional measurement values.