Suggested Instructional Timeline: Quarter 1			
Unit 1	9/6/17 – 10/7/16 (5 WEEKS)		
Unit 2	10/11/16 – 11/2/16 (4 WEEKS)		
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Sixth Grade Mathematics	**Quarter 1 – Unit 1**
Common Core Domains and Clusters:	**The Number System (NS)** - Apply and extend previous understandings of multiplication and division to divide fractions by fractions. - Compute fluently with multi-digit numbers and find common factors and multiples
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE - FIVE (9/6/17 – 10/7/16)		
6. NS.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a*	• **Use visual models such as fraction bars, number lines, and are models to show the quotient of whole numbers and**

	story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	**fractions. Students use the models to show the connection between those models and the multiplication of fractions.** • **Understand the difference between a whole number being divided by a fraction and a fraction being divided by a whole number.** • **Make connections between visual models and multiplication of fractions.** • **Connect estimations with place value in order to determine the standard algorithm for division.** • **Use the algorithm to divide multi-digit numbers with and without remainders. Students compare their answer to estimates to justify reasonable quotients.** • **Students understand that when they "bring down" the next digit in the algorithm, they are distributing, recording, and shifting to the next place value.** • **Find the least common multiple and greatest common factor to the distributive property.**
6. NS.2	Fluently divide multi-digit numbers using the standard algorithm. **(6th Grade Fluency Standard)**	
6. NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **(6th Grade Fluency Standard)**	
6.NS.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express36 + 8 as 4 (9 + 2).	

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

6. NS.1	In 5th grade students divided whole numbers by unit fractions and divided unit fractions by whole numbers. Students continue to develop this concept by using visual models and equations to divide whole numbers by fractions and fractions by fractions to solve word problems. Students develop an understanding of the relationship between multiplication and division. Students also write contextual problems for fraction division problems.
6. NS.2	In the elementary grades, students were introduced to division through concrete models and various strategies to develop an understanding of this mathematical operation (limited to 4-digit numbers divided by 2-digit numbers). In 6th grade, students become fluent in the use of the standard division algorithm, continuing to use their understanding of place value to describe what they are doing. Place value has been a major emphasis in the elementary standards. This standard is the end of this progression to address students' understanding of place value.
6. NS.3	Procedural fluency is defined by the Common Core as "skill in carrying out procedures flexibly, accurately, efficiently and appropriately". In 4th and 5th grades, students added and subtracted decimals. Multiplication and division of decimals were introduced in 5th grade (decimals to the hundredth place). At the elementary level, these operations were based on concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. In 6th grade, students become fluent in the use of the standard algorithms of each of these operations. The use of estimation strategies supports student understanding of decimal operations.
6.NS.4	In elementary school, students identified primes, composites and factor pairs (4.OA.4). In 6th grade students will find the greatest common factor of two whole numbers less than or equal to 100. Students also understand that the greatest common factor of two prime numbers is 1. Given various pairs of addends using whole numbers from 1-100, students should be able to identify if the two numbers have a common factor. If they do, they identify the common factor and use the distributive property to rewrite the expression. They prove that they are correct by simplifying

	both expressions. Students find the least common multiple of two whole numbers less than or equal to twelve.

Sixth Grade Mathematics	**Quarter 1 – Unit 2**
Common Core Domains and Clusters:	**Ratios & Proportional Relationships (RP)** - Understand ratio concepts and use ratio reasoning to solve problems
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS SIX - NINE (10/11/16 – 11/2/16)		
6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	• **Understand a ratio is an ordered pair of non-negative numbers, which are not both zero. Students understand that a ratio is often used instead of describing the first number as a multiple of the second.** • **Use the precise language and notation of ratios (e.g., 3:2, 3 to 2). Students understand that the order of the pair of numbers in a ratio matters and that the description of the**
6.RP.2	Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar,*	

	so there is ¾ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."	**ratio relationship determines the correct order of the numbers.** • **Create multiple ratios from a context in which more that two quantities are given** • **Understand the relationship between ratios and fractions. Students describe the fraction A/B associated with the ratio A:B as the value of the ratio A to B.** • **Use tape diagrams to solve problems when the part-to-part ratio is given and the value of one of the quantities is given.** • **Identify the additive and multiplicative structure of a ratio table and use the structure to make additional entries in the table.** • **Solve problems by comparing different ratios using two or more ratio tables.** • **Create equivalent ratios using a ratio table and represent these ratios on a double line diagram.** • **Precisely identify the associated rate, given a ratio. Students identify the unit rate and the rate unit.** • **Recognize that all ratios associated to a given rate are equivalent because they have the same value.** • **Solve problems by analyzing different unit rates given in tables, equations, and graphs.**
6.RP.3a	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **a.** Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	
6.RP.3b	**b.** Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*	
6.RP.3c	**c.** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	
6.RP.3d	**d.** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	

Unpacking: What do these standards mean a child will know and be able to do?	
6.RP.1	A ratio is the comparison of two quantities or measures. The comparison can be part-to-whole (ratio of guppies to all fish in an aquarium) or part-to-part (ratio of guppies to goldfish).
6.RP.2	A unit rate expresses a ratio as part-to-one, comparing a quantity in terms of one unit of another quantity. Common unit rates are cost per item or distance per time. Students are able to name the amount of either quantity in terms of the other quantity. Students will begin to notice that related unit rates (i.e. miles / hour and hours / mile) are reciprocals as in the second example below. At this level, students should use reasoning to find these unit rates instead of an algorithm or rule. In 6th grade, students are not expected to work with unit rates expressed as complex fractions. Both the numerator and denominator of the original ratio will be whole numbers.
6.RP.3a	Ratios and rates can be used in ratio tables and graphs to solve problems. Previously, students have used additive reasoning in tables to solve problems. To begin the shift to proportional reasoning, students need to begin using multiplicative reasoning. To aid in the development of proportional reasoning the cross-product algorithm is ***not*** expected at this level. When working with ratio tables and graphs, ***whole number*** measurements are the expectation for this standard. Students use tables to compare ratios. Students are able to plot ratios as ordered pairs.

6.RP.3b	Students recognize the use of ratios, unit rate and multiplication in solving problems, which could allow for the use of fractions and decimals
6.RP.3c	This is the students' first introduction to percent. Percentages are a rate per 100. Models, such as percent bars or10 x 10 grids should be used to model percent. Students use ratios to identify percent. Students use percentages to find the part when given the percent, by recognizing that the whole is being divided into 100 parts and then taking a part of them (the percent). Students also determine the whole amount, given a part and the percent.
6.RP.3d	A ratio can be used to compare measures of two different types, such as inches per foot, milliliters per liter and centimeters per inch. Students recognize that a conversion factor is a fraction equal to 1 since the numerator and denominator describe the same quantity. Students use ratios as conversion factors and the identity property for multiplication to convert ratio units.

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

Sixth Grade Mathematics	**Quarter 2 – Unit 1**
Common Core Domains and Clusters:	**The Number System (NS)** - Apply and extend previous understandings of numbers to the system of rational numbers.
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE - FOUR (11/7/16 – 12/9/16)		
6. NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts,	• **Understand that the set of integers includes the set of positive whole number and their opposites, as well as zero.** • **Use vocabulary precisely when describing and representing situations involving integers; e.g., an elevation of -19 feet is**

	explaining the meaning of 0 in each situation.	**the same as 10 feet below the fixed reference point.** • **Locate and position opposite numbers on a number line.** • **Write, interpret, and explain statements of order for rational numbers in the real-world.** • **Relate integers and other rational numbers to real world situations and problems.** • **Understand the absolute value of a number as its distance from zero on the number line.** • **Use absolute value to fine the magnitude of a positive or negative quantity in a real-world situation.** • **Locate points in the coordinate plane that correspond to given ordered pairs of integers and other rational numbers.** • **Use the coordinate plane to graph points, line segments and geometric shapes in the various quadrants and the use the absolute value to find the related distances.**
6. NS.6a	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **a.** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., – (–3) = 3, and that 0 is its own opposite	
6. NS.6b	**b.** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	
6. NS.6c	**c.** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	
6. NS.7a	Understand ordering and absolute value of rational numbers. **a.** Interpret statements of inequality as statements about the relative position of two numbers on a number line. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.*	
6. NS.7b	**b.** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 degrees Celsius > –7 degrees Celsius to express the fact that –3 degrees Celsius is warmer than –7 degrees Celsius.*	
6. NS.7c	**c.** Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*	
6. NS.7d	**d.** Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –*	

	30 dollars represents a debt greater than 30 dollars	
6. NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	
Unpacking: What do these standards mean a child will know and be able to do?		
6. NS.5	Students use rational numbers (fractions, decimals, and integers) to represent real-world contexts and understand the meaning of 0 in each situation.	
6. NS.6a **6. NS.6b** **6. NS.6c**	In elementary school, students worked with positive fractions, decimals and whole numbers on the number line and in quadrant 1 of the coordinate plane. In 6th grade, students extend the number line to represent all rational numbers and recognize that number lines may be either horizontal or vertical (i.e. thermometer) which facilitates the movement from number lines to coordinate grids. Students recognize that a number and its opposite are equidistance from zero (reflections about the zero). The opposite sign (–) shifts the number to the opposite side of 0. Students worked with Quadrant I in elementary school. As the x-axis and y-axis are extending to include negatives, students begin to with the Cartesian Coordinate system. Students recognize the point where the x-axis and y-axis intersect as the origin. Students identify the four quadrants and are able to identify the quadrant for an ordered pair based on the signs of the coordinates. For example, students recognize that in Quadrant II, the signs of all ordered pairs would be (–, +). Students understand the relationship between two ordered pairs differing only by signs as reflections across one or both axes. For example, in the ordered pairs (-2, 4) and (-2, -4), the y-coordinates differ only by signs, which represents a reflection across the x-axis. A change is the x-coordinates from (-2, 4) to (2, 4), represents a reflection across the y-axis. When the signs of both coordinates change, [(2, -4) changes to (-2, 4)], the ordered pair has been reflected across both axes.	
6. NS.7a	Students use inequalities to express the relationship between two rational numbers, understanding that the value of numbers is smaller moving to the left on a number line. Common models to represent and compare integers include number line models, temperature models and the profit/loss model. On a number line model, the number is represented by an arrow drawn from zero to the location of the number on the number line; the absolute value is the length of this arrow. The number line can also be viewed as a thermometer where each point of on the number line is a specific temperature. In the profit-loss model, a positive number corresponds to profit and the negative number corresponds to a loss. Each of these models is useful for examining values but can also be used in later grades when students begin to perform operations on integers. Operations with integers are not the expectation at this level. In working with number line models, students internalize the order of the numbers; larger numbers on the right (horizontal) or top (vertical) of the number line and smaller numbers to the left (horizontal) or bottom (vertical) of the number line. They use the order to correctly locate integers and other rational numbers on the number line. By placing two numbers on the same number line, they are able to write inequalities and make statements about the relationships between two numbers. Students recognize the distance from zero as the absolute value or magnitude of a rational number. Students need multiple experiences to understand the relationships between numbers, absolute value, and statements about order.	
6. NS.7b	Students write statements using < or > to compare rational number in context. However, explanations should reference the context rather than "less than" or "greater than". Although 6.NS.7a is limited to two numbers, this part of the standard expands the ordering of rational numbers to more than two numbers in context.	

6. NS.7c	Students understand absolute value as the distance from zero and recognize the symbols | | as representing absolute value. In real-world contexts, the absolute value can be used to describe size or magnitude.
6. NS.7d	When working with positive numbers, the absolute value (distance from zero) of the number and the value of the number is the same; therefore, ordering is not problematic. However, negative numbers have a distinction that students need to understand. As the negative number increases (moves to the left on a number line), the value of the number decreases. For example, –24 is less than –14 because –24 is located to the left of –14 on the number line. However, absolute value is the distance from zero. In terms of absolute value (or distance) the absolute value of –24 is greater than the absolute value of –14. For negative numbers, as the absolute value increases, the value of the negative number decreases. Students graph coordinates for polygons and find missing vertices based on properties of triangles and quadrilaterals.
6. NS.8	Students find the distance between points when ordered pairs have the same x-coordinate (vertical) or same y-coordinate (horizontal).

Sixth Grade Mathematics	**Quarter 2 – Unit 2**
Common Core Domains and Clusters:	**Expressions & Equations (EE)** - Apply and extend previous understandings of arithmetic to algebraic expressions. - Reason about and solve one-variable equations and inequalities. - Represent and analyze quantitative relationships between dependent and independent variables.
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS FIVE- TEN (12/12/16 – 2/2/17)		
6. EE.1	Write and evaluate numerical expressions involving whole-number exponents.	• **Evaluate numerical expressions. They recognize that in the absence of parentheses, exponents are evaluated first.** • **Understand that a letter represents one number in an expression. When that number replaces the letter, the expressions can be evaluated to one number.** • **Write expressions that record addition and subtraction operations with numbers.** • **Identify parts of an expression using mathematical terms for multiplication. They view one or more parts of an expression as a single entity.** • **Model and write equivalent expressions using the distributive property.** • **Identify parts of an algebraic expression using mathematical terms for all operations.** • **Write algebraic expressions that record all operations with numbers and letters standing for the numbers.** • **Use variable to write expression involving addition and subtraction from real-world problems.** • **Develop expressions involving multiplication and division from real-world problems.** • **Identify values for the variables in a equation and inequality that result in true number sentences.** • **Identify values for the variables in an equation and inequality that result in false number sentences.** • **Analyze an equation in two variable to choose an independent variable and dependent variable.** • **Recognize the inequalities of the form x<c and x>c, where x is a variable and c is a fixed number have many solutions when the values of x come from a set of rational numbers.**
6. EE.2a	Write, read, and evaluate expressions in which letters stand for numbers. **a.** Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 – y.	
6. EE.2b	**b.** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*	
6. EE.2c	**c.** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole- number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = ½.*	
6. EE.3	Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	
6. EE.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	

6. EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	
6. EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	
6. EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers	
6. EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x< c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	
6. EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	
Unpacking: What do these standards mean a child will know and be able to do?		
6. EE.1	Students demonstrate the meaning of exponents to write and evaluate numerical expressions with whole number exponents. The base can be a whole number, positive decimal or a positive fraction. Students recognize that an expression with a variable represents the same mathematics and write algebraic expressions from verbal expressions. Order of operations is introduced throughout elementary grades, including the use of grouping symbols, ( ), { }, and[ ] in 5th grade. Order of operations with exponents is the focus in 6th grade.	

6. EE.2a	Students write expressions from verbal descriptions using letters and numbers, understanding order is important in writing subtraction and division problems. Students understand that the expression "5 times any number, *n*" could be represented with 5*n* and that a number and letter written together means to multiply. All rational numbers may be used in writing expressions when operations are not expected. Students use appropriate mathematical language to write verbal expressions from algebraic expressions. It is ***important*** for students to read algebraic expressions in a manner that reinforces that the variable represents a number. Students can describe expressions such as 3 (2 + 6) as the product
6. EE.2b	of two factors: 3 and (2 + 6). The quantity (2 + 6) is viewed as one factor consisting of two terms. Terms are the parts of a sum. When the term is an explicit number, it is called a constant. When the term is a product of a number and a variable, the number is called the coefficient of the variable. Students should identify the parts of an algebraic expression including variables, coefficients, constants, and the names of operations (sum, difference, product, and quotient). Variables are letters that represent numbers. There are various possibilities for the number they can represent.
6. EE.2c	Students evaluate algebraic expressions, using order of operations as needed. Problems such as example 1 below require students to understand that multiplication is understood when numbers and variables are written together and to use the order of operations to evaluate. Order of operations is introduced throughout elementary grades, including the use of grouping symbols, ( ), { }, and [ ] in 5th grade. Order of operations with exponents is the focus in 6th grade. In 5th grade students worked with the grouping symbols ( ), [ ], and { }. Students understand that the fraction bar can also serve as a grouping symbol (treats numerator operations as one group and denominator operations as another group) as well as a division symbol. Given a context and the formula arising from the context, students could write an expression and then evaluate for any number.
6. EE.3	Students use the distributive property to write equivalent expressions. Using their understanding of area models from elementary students illustrate the distributive property with variables. Properties are introduced throughout elementary grades (3.OA.5); however, there has not been an emphasis on recognizing and naming the property. In 6th grade students are able to use the properties and identify by name as used when justifying solution methods. When given an expression representing area, students need to find the factors. Students interpret *y* as referring to one *y.* Thus, they can reason that one *y* plus one *y* plus one *y* ***must be*** *3y.* They also use the distributive property, the multiplicative identity property of 1, and the commutative property for multiplication to prove that $y + y + y = 3y$:
6. EE.4	Students demonstrate an understanding of like terms as quantities being added or subtracted with the same variables and exponents. Students can also generate equivalent expressions using the associative, commutative, and distributive properties. They can prove that the expressions are equivalent by simplifying each expression into the same form.
6. EE.5	In elementary grades, students explored the concept of equality. In 6th grade, students explore equations as expressions being set equal to a specific value. The solution is the value of the variable that will make the equation or inequality true. Students use various processes to identify the value(s) that when substituted for the variable will make the equation true
6. EE.6	Students write expressions to represent various real-world situations. Given a contextual situation, students define variables and write an expression to represent the situation. No solving is expected with this standard; however, 6.EE.2c does address the evaluating of the expressions. Students understand the inverse relationships that can exist between two variables. Connecting writing expressions with story problems and/or drawing pictures will give students a context for this work. It is important for students to read algebraic expressions in a manner that reinforces that the variable represents a number.
6. EE.7	Students have used algebraic expressions to generate answers given values for the variable. This understanding is now expanded to equations

	where the value of the variable is unknown but the outcome is known. For example, in the expression, $x + 4$, any value can be substituted for the x to generate a numerical answer; however, in the equation $x + 4 = 6$, there is only one value that can be used to get a 6. Problems should be in context when possible and use only one variable. Students write equations from real-world problems and then use inverse operations to solve one-step equations based on real world situations. Equations may include fractions and decimals with non-negative solutions. Beginning experiences in solving equations require students to understand the meaning of the equation and the solution in the context of the problem.
6. EE.8	Many real-world situations are represented by inequalities. Students write inequalities to represent real world and mathematical situations. Students use the number line to represent inequalities from various contextual and mathematical situations.
6. EE.9	The purpose of this standard is for students to understand the relationship between two variables, which begins with the distinction between dependent and independent variables. The independent variable is the variable that can be changed; the dependent variable is the variable that is affected by the change in the independent variable. Students recognize that the independent variable is graphed on the *x*-axis; the dependent variable is graphed on the *y*-axis. Students recognize that not all data should be graphed with a line. Data that is discrete would be graphed with coordinates only. Discrete data is data that would not be represented with fractional parts such as people, tents, records, etc. For example, a graph illustrating the cost per person would be graphed with points since part of a person would not be considered. A line is drawn when both variables could be represented with fractional parts. Students are expected to recognize and explain the impact on the dependent variable when the independent variable changes (As the *x* variable increases, how does the *y* variable change?) *Relationships should be proportional with the line passing through the origin*. Additionally, students should be able to write an equation from a word problem and understand how the coefficient of the dependent variable is related to the graph and /or a table of values. Students can use many forms to represent relationships between quantities. Multiple representations include describing the relationship using language, a table, an equation, or a graph. Translating between multiple representations helps students understand that each form represents the same relationship and provides a different perspective.

Suggested Instructional Timeline: Quarter 3			
Unit 1	2/6/17 – 3/3/17 (4 WEEKS)		
Unit 2	3/6/17 – 4/6/17 (5 WEEKS)		
PARCC Content Cluster Color Code	**Major Cluster**	**Supporting Cluster**	**Additional Cluster**

Sixth Grade Mathematics	**Quarter 3 – Unit 1**
Common Core Domains and Clusters:	**Geometry (G)** - Solve real-world and mathematical problems involving area, surface area, and volume.
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation..

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE – FOUR (2/6/17 – 3/3/17)		
6. G.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	• **Understand that the area of a parallelogram is the are of the region bounded by the parallelogram.** • **Deconstruct triangle to justify that the area of a triangle is**

6. G.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	**exactly one half the area of a parallelogram.** • **Decompose rectangles to determine the area of other quadrilaterals.** • **Use absolute value to determine the distance between integers on the coordinate plane in order to find side lengths of polygons.** • **Determine distance, perimeter, and area in real-world contexts.** • **Apply the formula V – l * w * h to find the volume of a right rectangular prism and use the correct volume units when writing the answer.** • **Construct three-dimensional figures through the use of nets.** • **Use nets to determine the surface area of three dimensional figures.**
6. G.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	
6. G 4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems	

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

6.G.1	Students continue to understand that area is the number of squares needed to cover a plane figure. Students should know the formulas for rectangles and triangles. "Knowing the formula" does not mean memorization of the formula. To "know" means to have an understanding of ***why*** the formula works and how the formula relates to the measure (area) and the figure. This understanding should be for *all* students. Finding the area of triangles is introduced in relationship to the area of rectangles – a rectangle can be decomposed into two congruent triangles. Therefore, the area of the triangle is . the area of the rectangle. The area of a rectangle can be found by multiplying base x height; therefore, the area of the triangle is bh or (b x h)/2. Students decompose shapes into rectangles and triangles to determine the area.
6.G.2	Previously students calculated the volume of right rectangular prisms (boxes) using whole number edges. The use of models was emphasized as students worked to derive the formula V = Bh (5.MD.3, 5.MD.4, 5.MD.5) The unit cube was 1 x 1 x 1. In 6th grade the unit cube will have fractional edge lengths. Students find the volume of the right rectangular prism with these unit cubes. Students need multiple opportunities to measure volume by filling rectangular prisms with blocks and looking at the relationship between the total volume and the area of the base. Through these experiences, students *derive* the volume formula (volume equals the area of the base times the height). In addition to filling boxes, students can draw diagrams to represent fractional side lengths, connecting with multiplication of fractions. This process is similar to composing and decomposing two-dimensional shape.
6.G.3	Students are given the coordinates of polygons to draw in the coordinate plane. If both *x*-coordinates are the same (2, -1) and (2, 4), then students recognize that a vertical line has been created and the distance between these coordinates is the distance between -1 and 4, or 5. If both the *y*-coordinates are the same (-5, 4) and (2, 4), then students recognize that a horizontal line has been created and the distance between these coordinates is the distance between -5 and 2, or 7. Using this understanding, student solve real-world and mathematical problems, including finding the area and perimeter of geometric figures drawn on a coordinate plane. This standard can be taught in conjunction with **6.G.1** to help students develop the formula for the triangle by using the squares of the coordinate grid. Given a triangle, students can make the corresponding

	square or rectangle and realize the triangle is... Students' progress from counting the squares to making a rectangle and recognizing the triangle as to the development of the formula for the area of a triangle.
6.G.4	A net is a two-dimensional representation of a three-dimensional figure. Students represent three dimensional figures whose nets are composed of rectangles and triangles. Students recognize that parallel lines on a net are congruent. Using the dimensions of the individual faces, students calculate the area of each rectangle and/or triangle and add these sums together to find the surface area of the figure. Students construct models and nets of three-dimensional figures, describing them by the number of edges, vertices, and faces. Solids include rectangular and triangular prisms. Students are expected to use the net to calculate the surface area. Students also describe the types of faces needed to create a three-dimensional figure. Students make and test conjectures by determining what is needed to create a specific three-dimensional figure.

Sixth Grade Mathematics	Quarter 3 – Unit 2
Common Core Domains and Clusters:	**Statistics & Probability (SP)** - Develop understanding of statistical variability. - Summarize and describe distributions.
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Common Core Standards		Skill Focus: Students will understand how to...
WEEKS FIVE - NINE (3/6/17 – 4/6/17)		
6. SP.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	• **Distinguish between statistical questions and those that are not statistical.** • **Create a dot plot of a given data set.** • **Calculate the median data, given a data set.** • **Describe the variability in the data by calculating the interquartile range.** • **Construct a statistical questions and a plan to collect data to answer the questions.**
6. SP.2	Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.	

6. SP.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number	• **Use data to construct appropriate graphical and numerical summaries.** • **Use graphical and numerical summaries to answer statistical questions.** • **Match the graphical representations and numerical summaries of a distribution. Matches involve dot plots, histograms, and summary statistics.** • **Describe the data collected, including the number of responses, mean or median, and the interquartile range (IQR).**
6. SP.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	
6. SP.5a	Summarize numerical data sets in relation to their context, such as by: **a.** Reporting the number of observations.	
6. SP.5b	**b.** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	
6. SP.5c	**c.** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered	
6. SP.5d	**d.** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	

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

6.SP.1	Statistics are numerical data relating to a group of individuals; statistics is also the name for the science of collecting, analyzing and interpreting such data. A statistical question anticipates an answer that varies from one individual to the next and is written to account for the variability in the data. Data are the numbers produced in response to a statistical question. Data are frequently collected from surveys or other sources (i.e. documents). Students differentiate between statistical questions and those that are not. A statistical question is one that collects information that addresses differences in a population. The question is framed so that the responses will allow for the differences. For example, the question, "How tall am I?" is not a statistical question because there is only one response; however, the question, "How tall are the students in my class?" is a statistical question since the responses anticipates variability by providing a variety of possible anticipated responses that have numerical answers. Questions can result in a narrow or wide range of numerical values. Students might want to know about the fitness of the students at their school. Specifically, they want to know about the exercise habits of the students. So rather than asking "Do you exercise?" they should ask about the amount of exercise the students at their school get per week. A statistical question for this study could be: "How many hours per week on average do students at Jefferson Middle School exercise?"
6.SP.2.	The distribution is the arrangement of the values of a data set. Distribution can be described using center(median or mean), and spread. Data collected can be represented on graphs, which will show the shape of the distribution of the data. Students examine the distribution of a data set and discuss the center, spread and overall shape with dot plots, histograms and box plots.
6.SP.3	Data sets contain many numerical values that can be summarized by one number such as a measure of center. The measure of center gives a numerical value to represent the center of the data (i.e. midpoint of an ordered list or the balancing point). Another characteristic of a data set is

	the variability (or spread) of the values. Measures of variability are used to describe this characteristic.
6.SP.4	Students display data graphically using number lines. Dot plots, histograms and box plots are three graphs to be used. Students are expected to determine the appropriate graph as well as read data from graphs generated by others. Dot plots are simple plots on a number line where each dot represents a piece of data in the data set. Dot plots are suitable for small to moderate size data sets and are useful for highlighting the distribution of the data including clusters, gaps, and outliers. A histogram shows the distribution of continuous data using intervals on the number line. The height of each bar represents the number of data values in that interval. In most real data sets, there is a large amount of data and many numbers will be unique. A graph (such as a dot plot) that shows how many ones, how many twos, etc. would not be meaningful; however, a histogram can be used. Students group the data into convenient ranges and use these intervals to generate a frequency table and histogram. Note that changing the size of the bin changes the appearance of the graph and the conclusions may vary from it. A box plot shows the distribution of values in a data set by dividing the set into quartiles. It can be graphed either vertically or horizontally. The box plot is constructed from the five-number summary (minimum, lower quartile, median, upper quartile, and maximum). These values give a summary of the shape of a distribution. Students understand that the size of the box or whiskers represents the middle 50% of the data.
6. SP.5a **6. SP.5b** **6. SP.5c** **6. SP.5d**	Students summarize numerical data by providing background information about the attribute being measured, methods and unit of measurement, the context of data collection activities (addressing random sampling), the number of observations, and summary statistics. Summary statistics include quantitative measures of center (median and median) and variability (interquartile range and mean absolute deviation) including extreme values (minimum and maximum), mean, median, mode, range, and quartiles. Students record the number of observations. Using histograms, students determine the number of values between specified intervals. Given a box plot and the total number of data values, students identify the number of data points that are represented by the box. Reporting of the number of observations must consider the attribute of the data sets, including units (when applicable). <u>Measures of Center</u> Given a set of data values, students summarize the measure of center with the median or mean. The median is the value in the middle of a ordered list of data. This value means that 50% of the data is greater than or equal to it and that 50% of the data is less than or equal to it. The mean is the arithmetic average; the sum of the values in a data set divided by how many values there are in the data set. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students develop these understandings of what the mean represents by redistributing data sets to be level or fair(equal distribution) and by observing that the total distance of the data values above the mean is equal to the total distance of the data values below the mean (balancing point). Students use the concept of mean to solve problems. Given a data set represented in a frequency table, students calculate the mean. Students find a missing value in a data set to produce a specific average. <u>Measures of Variability</u> Measures of variability/variation can be described using the interquartile range or the Mean Absolute Deviation. The interquartile range (IQR) describes the variability between the middle 50% of a data set. It is found by subtracting the lower quartile from the upper quartile. It represents the length of the box in a box plot and is not affected by outliers. Students find the IQR from a data set by finding the upper and lower quartiles and taking the difference or from reading a box plot. Mean Absolute Deviation (MAD) describes the variability of the data set by determining the absolute deviation (the distance) of each data piece from the mean and then finding the average of these deviations. Both the interquartile range and the Mean Absolute Deviation are represented by

	a single numerical value. Higher values represent a greater variability in the data. Students understand how the measures of center and measures of variability are represented by graphical displays. Students describe the context of the data, using the shape of the data and are able to use this information to determine an appropriate measure of center and measure of variability. The measure of center that a student chooses to describe a data set will depend upon the shape of the data distribution and context of data collection. The mode is the value in the data set that occurs most frequently. The mode is the least frequently used as a measure of center because data sets may not have a mode, may have more than one mode, or the mode may not be descriptive of the data set. The mean is a very common measure of center computed by adding all the numbers in the set and dividing by the number of values. The mean can be affected greatly by a few data points that are very low or very high. In this case, the median or middle value of the data set might be more descriptive. In data sets that are symmetrically distributed, the mean and median will be very close to the same. In data sets that are skewed, the mean and median will be different, with the median frequently providing a better overall description of the data set.

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

Sixth Grade Mathematics	**Quarter 3 – Unit 1**
Common Core Domains and Clusters:	**Expressions & Equations (EE)** - Apply and extend previous understandings of arithmetic to algebraic expressions. - Reason about and solve one-variable equations and inequalities. - Represent and analyze quantitative relationships between dependent and independent variables.
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:** **6. NS.2 -** Fluently divide multi-digit numbers using the standard algorithm. **6. NS.3 -** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Common Core Standards		**Skill Focus: Students will understand how to...**
WEEKS ONE- NINE (2/8/16 – 4/7/16)		
6. EE.1	Write and evaluate numerical expressions involving whole-number exponents.	• **Evaluate numerical expressions. They recognize that in the absence of parentheses, exponents are evaluated first.**
6. EE.2a	Write, read, and evaluate expressions in which letters stand for	• **Understand that a letter represents one number in an**

	numbers. **a.** Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 – y.	**expression. When that number replaces the letter, the expressions can be evaluated to one number.** • **Write expressions that record addition and subtraction operations with numbers.** • **Identify parts of an expression using mathematical terms for multiplication. They view one or more parts of an expression as a single entity.** • **Model and write equivalent expressions using the distributive property.** • **Identify parts of an algebraic expression using mathematical terms for all operations.** • **Write algebraic expressions that record all operations with numbers and letters standing for the numbers.** • **Use variable to write expression involving addition and subtraction from real-world problems.** • **Develop expressions involving multiplication and division from real-world problems.** • **Identify values for the variables in a equation and inequality that result in true number sentences.** • **Identify values for the variables in an equation and inequality that result in false number sentences.** • **Analyze an equation in two variable to choose an independent variable and dependent variable.** • **Recognize the inequalities of the form x<c and x>c, where x is a variable and c is a fixed number have many solutions when the values of x come from a set of rational numbers.**
6. EE.2b	**b.** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*	
6. EE.2c	**c.** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole- number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = ½.*	
6. EE.3	Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	
6. EE.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	
6. EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	

6. EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	
6. EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers	
6. EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x< c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	
6. EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	

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

6. EE.1	Students demonstrate the meaning of exponents to write and evaluate numerical expressions with whole number exponents. The base can be a whole number, positive decimal or a positive fraction. Students recognize that an expression with a variable represents the same mathematics and write algebraic expressions from verbal expressions. Order of operations is introduced throughout elementary grades, including the use of grouping symbols, ( ), { }, and[ ] in 5th grade. Order of operations with exponents is the focus in 6th grade.
6. EE.2a	Students write expressions from verbal descriptions using letters and numbers, understanding order is important in writing subtraction and division problems. Students understand that the expression "5 times any number, n" could be represented with $5n$ and that a number and letter written together means to multiply. All rational numbers may be used in writing expressions when operations are not expected. Students use appropriate mathematical language to write verbal expressions from algebraic expressions. It is ***important*** for students to read algebraic expressions in a manner that reinforces that the variable represents a number. Students can describe expressions such as 3 (2 + 6) as the product of two factors: 3 and (2 + 6). The quantity (2 + 6) is viewed as one factor consisting of two terms. Terms are the parts of a sum. When the term is an explicit number, it is called a constant. When the term is a product of a number and a variable, the number is called the coefficient of the variable. Students should identify the parts of an algebraic expression including variables, coefficients, constants, and the names of operations (sum, difference, product, and quotient). Variables are letters that represent numbers. There are various possibilities for the
6. EE.2b	

	number they can represent.
6. EE.2c	Students evaluate algebraic expressions, using order of operations as needed. Problems such as example 1 below require students to understand that multiplication is understood when numbers and variables are written together and to use the order of operations to evaluate. Order of operations is introduced throughout elementary grades, including the use of grouping symbols, ( ), { }, and [ ] in 5th grade. Order of operations with exponents is the focus in 6th grade. In 5th grade students worked with the grouping symbols ( ), [ ], and { }. Students understand that the fraction bar can also serve as a grouping symbol (treats numerator operations as one group and denominator operations as another group) as well as a division symbol. Given a context and the formula arising from the context, students could write an expression and then evaluate for any number.
6. EE.3	Students use the distributive property to write equivalent expressions. Using their understanding of area models from elementary students illustrate the distributive property with variables. Properties are introduced throughout elementary grades (3.OA.5); however, there has not been an emphasis on recognizing and naming the property. In 6th grade students are able to use the properties and identify by name as used when justifying solution methods. When given an expression representing area, students need to find the factors. Students interpret *y* as referring to one *y.* Thus, they can reason that one *y* plus one *y* plus one *y* ***must be*** *3y.* They also use the distributive property, the multiplicative identity property of 1, and the commutative property for multiplication to prove that $y + y + y = 3y$:
6. EE.4	Students demonstrate an understanding of like terms as quantities being added or subtracted with the same variables and exponents. Students can also generate equivalent expressions using the associative, commutative, and distributive properties. They can prove that the expressions are equivalent by simplifying each expression into the same form.
6. EE.5	In elementary grades, students explored the concept of equality. In 6th grade, students explore equations as expressions being set equal to a specific value. The solution is the value of the variable that will make the equation or inequality true. Students use various processes to identify the value(s) that when substituted for the variable will make the equation true
6. EE.6	Students write expressions to represent various real-world situations. Given a contextual situation, students define variables and write an expression to represent the situation. No solving is expected with this standard; however, 6.EE.2c does address the evaluating of the expressions. Students understand the inverse relationships that can exist between two variables. Connecting writing expressions with story problems and/or drawing pictures will give students a context for this work. It is important for students to read algebraic expressions in a manner that reinforces that the variable represents a number.
6. EE.7	Students have used algebraic expressions to generate answers given values for the variable. This understanding is now expanded to equations where the value of the variable is unknown but the outcome is known. For example, in the expression, $x + 4$, any value can be substituted for the *x* to generate a numerical answer; however, in the equation $x + 4 = 6$, there is only one value that can be used to get a 6. Problems should be in context when possible and use only one variable. Students write equations from real-world problems and then use inverse operations to solve one-step equations based on real world situations. Equations may include fractions and decimals with non-negative solutions. Beginning experiences in solving equations require students to understand the meaning of the equation and the solution in the context of the problem.
6. EE.8	Many real-world situations are represented by inequalities. Students write inequalities to represent real world and mathematical situations. Students use the number line to represent inequalities from various contextual and mathematical situations.

6. EE.9	The purpose of this standard is for students to understand the relationship between two variables, which begins with the distinction between dependent and independent variables. The independent variable is the variable that can be changed; the dependent variable is the variable that is affected by the change in the independent variable. Students recognize that the independent variable is graphed on the *x*-axis; the dependent variable is graphed on the *y*-axis. Students recognize that not all data should be graphed with a line. Data that is discrete would be graphed with coordinates only. Discrete data is data that would not be represented with fractional parts such as people, tents, records, etc. For example, a graph illustrating the cost per person would be graphed with points since part of a person would not be considered. A line is drawn when both variables could be represented with fractional parts. Students are expected to recognize and explain the impact on the dependent variable when the independent variable changes (As the *x* variable increases, how does the *y* variable change?) *Relationships should be proportional with the line passing through the origin*. Additionally, students should be able to write an equation from a word problem and understand how the coefficient of the dependent variable is related to the graph and /or a table of values. Students can use many forms to represent relationships between quantities. Multiple representations include describing the relationship using language, a table, an equation, or a graph. Translating between multiple representations helps students understand that each form represents the same relationship and provides a different perspective.