2016-2017

6th Grade Math Curriculum Pacing Guide

6th Grade Curriculum Team
Bloomfield Schools
2016-2017

6TH Grade common CCSSM Overview

Math Common Core Pacing Guide Introduction

The Bloomfield School District pacing guide documents are intended to guide teachers' use of Common Core State Standards (CCSS) over the course of an instructional school year. The guides identify the focus standards by quarter. Teachers should understand that the focus standards emphasize deep instruction for that timeframe. However, because a certain quarter does not address specific standards, it should be understood that previously taught standards should be reinforced while working on the focus standards for any designated quarter. Some standards will recur across all quarters due to their importance and need to be addressed on an ongoing basis.

The Math pacing guides are grounded in four key components: the key fluency expectations for each grade level, the critical areas designated in the CCSS Math Standards, the Common Core Standards for Mathematics and the integration of the Standards for Mathematical Practice. In planning instruction it is important that math teachers incorporate the 8 mathematical practices for mathematics to ensure that the Common Core standards are mastered by all students.

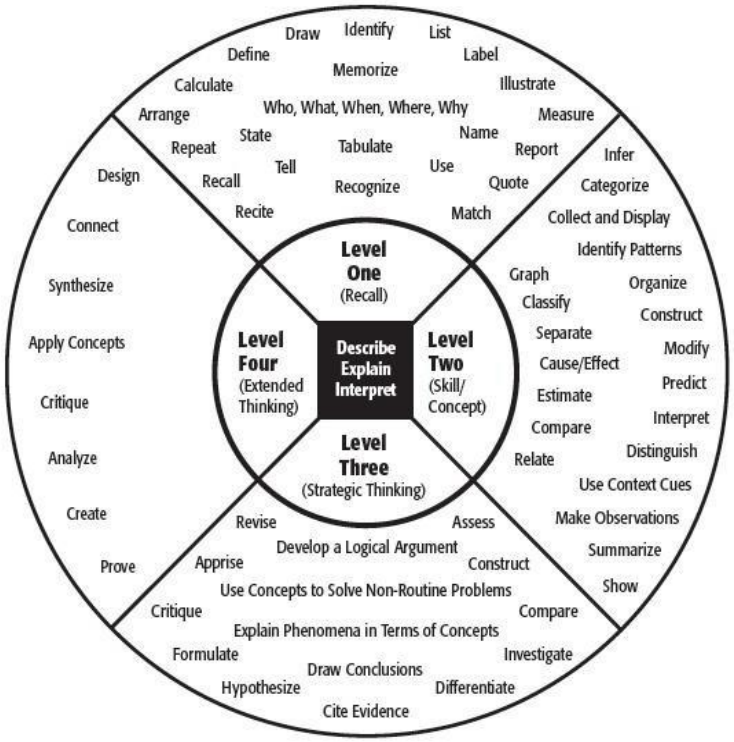
The Math CCSS pacing guides contain the following elements:

- Grade Level: Identify the grade level of the intended standard
- Standard with code: Defines the knowledge and skills for students. The code contains the grade level, domain and standard number.
- Domain: Larger groups of related standards. Standards from different domains may sometimes be closely related.

DOK level of learning is embedded in the Math standards in this format. For students to develop mastery in content area teacher must use scaffolding and begin to develop more rigorous activities within the standard.

Example: Numeracy: Adding single digit numbers: students use manipulatives and recall to know what 2+2 is : Level 2 : mastery of skill using different fact families to compare: DOK level 3: students begin to analyze and differentiate between 4+4= and 2+2= DOK level 4: Students begin to make connections with patterns in single digit addition groups.

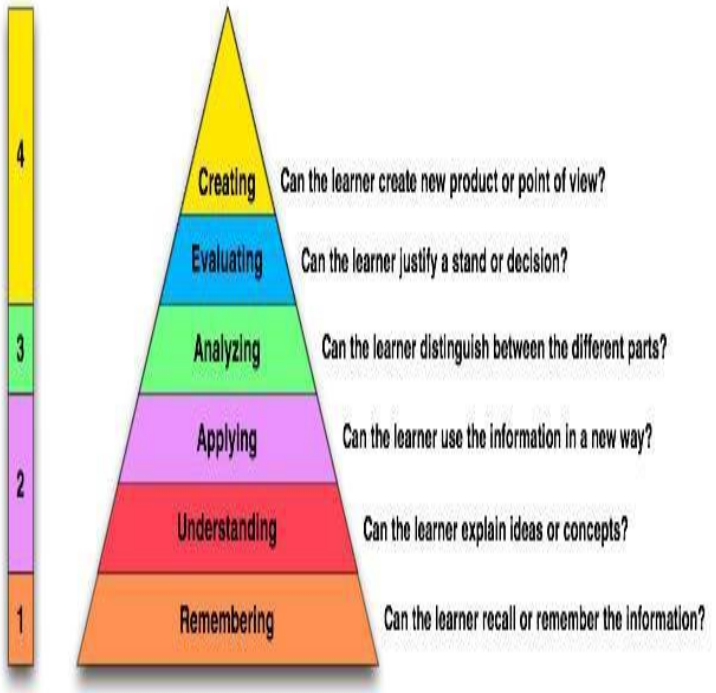
Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/ solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	Apply mathematical model to illuminate a problem or situation.
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Analyze and synthesize information from multiple sources.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Describe and illustrate how common themes are found across texts from different cultures.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Design a mathematical model to inform and solve a practical or abstract situation.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	
	Organize, represent and interpret data.		

Webb, Norman L. and others. "Web Alignment Tool" 24 July 2005. Wisconsin Center of Educational Research. University of Wisconsin-Madison. 2 Feb. 2006. <http://www.wcer.wisc.edu/WAT/index.aspx>.

Relationship between Depth of Knowledge and Bloom's Taxonomy



DoK Levels — New Version of Bloom's Taxonomy — http://www.odu.edu/educ/llschult/blooms_taxonomy.html

Depth of Knowledge was developed through a ten-state grant initiative to streamline Bloom's taxonomy to facilitate state-wide assessments.

Quarterly View of Standards 6th Grade Mathematics Pacing Guide	**Quarter**			
Ratios and Proportional Relationships	**1**	**2**	**3**	**4**
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."*	**X**			**X**
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."* ([1] Expectations for unit rates in this grade are limited to non-complex fractions.)	**X**			**X**
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. 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.	**X**			**X**
6.RP.3b 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. 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?*	**X**			**X**
6.RP.3c Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about **X** tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. 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.	**X**			**X**
6.RP.3d Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about **X** tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	**X**			**X**
The Number System	**1**	**2**	**3**	**4**
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 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 mile?*	**X**			**X**

6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.	**X**			**X**
6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	**X**			**X**
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, express 36 + 8 as 4 (9 + 2).*	**X**			**X**
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, explaining the meaning of 0 in each situation.		**X**		**X**
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. 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.		**X**		**X**
6.NS.6b 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. 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.		**X**		**X**
6.NS.6c 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. 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.		**X**		**X**
6.NS.7a Understand ordering and absolute value of rational numbers. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *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.*		**X**		**X**
6.NS.7b Understand ordering and absolute value of rational numbers. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 ^{o}C > –7 ^{o}C to express the fact that –3 ^{o}C is warmer than –7 ^{o}C.*		**X**		**X**
6.NS.7c Understand ordering and absolute value of rational numbers. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*		**X**		**X**
6.NS.7d Understand ordering and absolute value of rational numbers. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a*		**X**		**X**

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.		**X**		**X**
Expressions and Equations	**1**	**2**	**3**	**4**
6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.		**X**		**X**
6.EE.2a Write, read, and evaluate expressions in which letters stand for numbers. 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.*		**X**		**X**
6.EE.2b Write, read, and evaluate expressions in which letters stand for numbers. 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.*		**X**		**X**
6.EE.2c: Write, read, and evaluate expressions in which letters stand for numbers. 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 = 1/2.*		**X**		**X**
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 expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*		**X**		**X**
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.*		**X**		**X**
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.			**X**	**X**
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.			**X**	**X**
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.			**X**	**X**
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.			**X**	**X**
6.EE.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another;			**X**	**X**

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.*				
Geometry	**1**	**2**	**3**	**4**
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.	**X**			**X**
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.	**X**			**X**

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.	**X**			**X**
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.				**X**
Statistics and Probability	**1**	**2**	**3**	**4**
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.			**X**	**X**
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.			**X**	**X**
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.			**X**	**X**
6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.			**X**	**X**
6.SP.5.A Summarize numerical data sets in relation to their context by reporting the number of observations.			**X**	**X**
6.SP.5.B Summarize numerical data sets in relation to their context describing the nature of the attribute under investigation, including how it was measured and its units of measurement.			**X**	**X**
6.SP.5.C Summarize numerical data sets in relation to their context by 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 was gathered.			**X**	**X**
6.SP.5.D Summarize numerical data sets in relation to their context by relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data was gathered.			**X**	**X**

	Quarter 1			
Weeks 1-3	**The Number System:** *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. Apply and extend previous understandings of numbers to the system of rational numbers.* **Key Vocabulary:** quotient, fraction, visual fraction model, standard algorithm, dividend, divisor, Remainder, quotient, decimal, place value, product, sum ,difference, greatest common factor least common multiple, distributive property, compute, whole numbers, express, Make sense of **Geometry:** Solve real-world and mathematical problems involving area, surface area, and volume. **Key Vocabulary**: area, surface area, volume,			
	Standard	**Suggested Student Outcomes**	**Suggested Activities**	**Materials/Websites**
	6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation 6.NS.2 Fluently divide multi- digit numbers using the standard algorithm.	I will be able to add, subtract, multiply, and divide multi-digit decimals. I will be able to use the standard algorithm when necessary. I will be able to fluently add, subtract, multiply, and divide multi- digit decimals using the standard algorithm for each operation with speed and accuracy, without math tools (i.e., calculator).	Students create a book comparing decimals to thousandths. They should support their book with illustrations, text, and recorded narration. Student's record called decimal numbers on place value charts (e.g., 209.5). Students read each numeral and recite its respective place value (e.g., 2 hundreds, 0 tens, 9 ones and 5 tenths). Students write expanded forms of called numbers and check the expanded forms by multiplying each numeral by the value of its place and completing the addition. Students represent decimal numbers using decimal tiles (e.g., 0.2, 0.125), compare the decimals, and write comparison sentences for the values (0.2, 2, 0.125).	Envision Lessons 3-2, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9, 3-10, 8-5 6.NS.2 SE/TE: Envision Lesson 3-4 Teacher resource on standards 6.NS.3 Math Vocabulary Journal

	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, express 36 + 8 as 4 (9 + 2).. Math Practices Compute quotients of fractions. 6.NS.1 Solve word problems involving the division of fractions 6.NS.1		Students transfer numbers to place value charts to verify expressions, comparing digits in each place value starting at tenths and working to thousandths. 6.NS.4 Find the greatest common factor of two whole numbers less than or equal to 100. Example For example, express 36 + 8 as 4 (9 + 2) The factors of 5 are 1, 5. Draw a visual fraction model to illustrate the quotient of two fractions. 6.NS.1 Apply the relationship between multiplication and division to justify your answer. 6.NS.1	Add and Subtract Decimals V id eo Lin e'em u p Greatest Common Factor Video Khan Academy LearnZillion GCF Envision Lesson for 6.NS.4 5-3,5-6, 7-2 Envision Lessons 9-1, 9-3,9-4, 9-5 Share my Candy Lesson LearnZillion Resource 6.ns.1

	Quarter 1, Weeks 1-3 (continued)			
	Standard	**Suggested Student Outcomes**	**Suggested Activities**	**Materials/Websites**
Weeks 1-3	**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. **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.	• I can recognize and know how to compose and decompose polygons into triangles and rectangles. • I can compare the area of a triangle to the area of the composed rectangle. • I can apply the techniques of composing and/or decomposing to find the area of triangles, special quadrilaterals and polygons to solve mathematical and real world problems. • I can discuss, develop and justify formulas for triangles and parallelograms (6th grade introduction). • I can calculate the volume of a right rectangular prism. • I can apply volume formulas for right rectangular prisms to solve real-world and mathematical problems involving rectangular prisms with fractional edge lengths.	Project-Based Learning: Exploratorium Creekside Learning Better Lesson	Achieve the Core Khan Academy-6th Geometry IXL Adapted Mind Teaching Channel Activate Instruction LearnZillion

	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.	• I can model the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths. • I can draw polygons in the coordinate plane. • I can use coordinates (with the same x-coordinate or the same y-coordinate) to find the length of a side of a polygon. • I can apply the technique of using coordinates to find the length of a side of a polygon drawn in the coordinate plane to solve real-world and mathematical problems. • I can recognize that 3-D figures can be represented by nets. • I can represent three-dimensional figures using nets made up of rectangles and triangles. • I can apply knowledge of calculating the area of rectangles and triangles to a net. • I can combine the areas		

		for rectangles and triangles in the net to find the surface area of a 3-dimensional figure. • I can solve real-world and mathematical problems involving surface area using nets		

	Quarter 1, Weeks 4-7			
Weeks 4-7	**Ratios and Proportions:** Understand ratio concepts and use ratio reasoning to solve problems. **Key Vocabulary:** ratio, rate, coordinate, units, percentage, conversion			
	Standard	**Suggested Student Outcomes**	**Suggested Activities**	**Materials/Websites**
	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."* **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 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]	• I can explain how order matters when writing a ratio. • I can demonstrate how ratios can be simplified. • I can demonstrate how ratios compare two quantities; the quantities do not have to be the same unit of measure. • I can recognize that ratios appear in a variety of different contexts; part-to-whole, part-to part, and rates. • I can generalize that all ratios relate two quantities or measures within a given situation in a multiplicative relationship. • I can analyze context to determine which kind of ratio is represented. • I can identify and calculate a unit rate. • I can use appropriate math terminology as related to rate. • I can analyze the relationship between a ratio a:b and a unit rate a/b where b≠0.		Intro Lesson Performance Tasks Sample UbD Unit Sample Student Work/Activities Game Ideas Sample Lesson Plans

	6.RP.3.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.	• I can make a table of equivalent ratios using whole numbers. • I can find the missing values in a table of equivalent ratios. • I can plot pairs of values that represent equivalent ratios on the coordinate plane. • I can use tables to compare proportional quantities.		
	6.RP.3.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?*	• I can apply the concept of unit rate to solve real-world problems involving unit pricing. • I can apply the concept of unit rate to solve real-world problems involving constant speed.		
	6.RP.3.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.	• I can demonstrate how a percent is a ratio of a number to 100. • I can find a percent of a number as a rate per 100. • I can solve real-world problems involving finding the whole, given a part and a percent.		
	6.RP.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	• I can apply ratio reasoning to convert measurement units in real-world and mathematical problems.		

		• I can apply ratio reasoning to convert measurement units by multiplying or dividing in real-world and mathematical problems.		
Note: Quarter 1, Weeks 8-9 Common Interim Assessment (CIA), Reteach and Enrich				

Weeks 1-4

Quarter 2

The Number System: 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. Apply and extend previous understandings of numbers to the system of rational numbers.

Key Vocabulary: zero, positive, negative, opposite, pairs, coordinate, plane, axes, absolute value

Standard	Suggested Student Outcomes	Suggested Activities	Materials/Websites
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, explaining the meaning of 0 in each situation.	• I can identify an integer and its opposite. • I can use integers to represent quantities in real world situations (above/below sea level, etc). • I can explain where zero fits into a situation represented by integers.		Inside Mathematics LearnZillion Foldable Ideas Teacher Math Blog Sample Tasks Sample UbD Unit Lesson Plan Support
6.NS.6.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.	• I can identify the location of zero on a number line in relation to positive and negative numbers. • I can recognize opposite signs of numbers as locations on opposite sides of 0 on the number line. • I can reason that a double negative, e.g., -(-2) is the		

		opposite of that number itself.		
	6.NS.6.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.	• I can recognize the signs of both numbers in an ordered pair indicate which quadrant of the coordinate plane the ordered pair will be located. • I can reason that when only the x value in a set of ordered pairs are opposites, it creates a reflection over the y axis, e.g., (x,y) and (x,-y). • I can recognize that when only the y value in a set of ordered pairs are opposites, it creates a reflection over the x axis, e.g., (x,y) and (x,-y). • I can reason that when two ordered pairs differ only by signs, the locations of the points are related by reflections across both axes, e.g., (-x,-y) and (x,y).		
	6.NS.6.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.7.A Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3 > -7 as a statement that*	• I can find and position integers and other rational numbers on a horizontal or vertical number line diagram. • I can find a position pairs of integers and other rational		

	-3 is located to the right of -7 on a number line oriented from left to right.	numbers on a coordinate plane.		
	6.NS.7.B Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3 °C > -7 °C to express the fact that -3 °C is warmer than -7 °C*.	• I can interpret statements of inequality as statements about relative position of two numbers on a number line diagram. • I can write, interpret, and explain statements of order for rational numbers in real-world contexts.		
	6.NS.7.C Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars*.	• I can identify absolute value of rational numbers. • I can interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.		
	6.NS.7.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*.	• I can distinguish comparisons of absolute value from statements about order and apply to real world contexts.		
	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.	• I can calculate absolute value. • I can graph points in all four quadrants of the coordinate plane. • I can solve real-world problems by graphing points in all four quadrants of a coordinate plane. • I can calculate the distances between two points with the same first coordinate or the same second coordinate using absolute value, given only coordinates.		

Weeks 5-7

Quarter 2

Expressions and Equations: 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.

Key Vocabulary: zero, positive, negative, opposite, pairs, coordinate, plane, axes, absolute value

Standard	Suggested Student Outcomes	Suggested Activities	Materials/Websites
6.EE.1 Write and evaluate numerical expressions involving whole-number exponents. **6.EE.2.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.2.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.2.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	• I KNOW the difference between associative, commutative, and distributive properties • SIMPLIFY expressions using the properties • EXPLAIN the properties • COMPARE the expressions for equivalency • I Can Apply the Order of Operations to Simplify a Number Sentence." • "I Can Simplify Numerical Expressions with Exponents." • "I Can Translate a Written Mathematical Expression into a Symbolic Expression." • "I Can Write an Algebraic Expression to Represent a Real-World Situation."	Resources/Ideas Project Based Learning	•Learn Zillion Evaluate numerical expressions •Video teacher support •Khan Academy 6.EE.A.2 •Teacher Practice •Better Lesson 1st day of school •Grocery Shopping NYC Activity Equations on A balance scale Hands on Equations Video MathLand CCSSSheets(by topic) Sample Units

	parentheses to specify a particular order (Order of Operations). *For example, use the formulas V = s^3 and A = 6 s^2 to find the volume and surface area of a cube with sides of length s = 1/2.*			

Weeks 8-9

Quarter 2, Weeks 8-9

Expressions and Equations: 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.

Key Vocabulary: zero, positive, negative, opposite, pairs, coordinate, plane, axes, absolute value

Standard	Suggested Student Outcomes	Suggested Activities	Materials/Websites
6.EE.3 Apply the properties of operations to generate equivalent expressions. **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).	• I KNOW the difference between associative, commutative, and distributive properties • SIMPLIFY expressions using the properties • EXPLAIN the properties • COMPARE the expressions for equivalency • I Can Apply the Order of Operations to Simplify a Number Sentence." • "I Can Simplify Numerical Expressions with Exponents." • "I Can Translate a Written Mathematical Expression into a Symbolic Expression." • "I Can Write an Algebraic Expression to Represent a Real-World Situation."	*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 expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	Math Goodies • 6.EE.3 NY Engage Teacher support • 6.EE.3 Worksheet Practice • Many resources on one page to support 6.EE.4 • Equations on A balance scale Hands on Equations Video • Worksheets and Walkthroughs Teacher resource

Note: Quarter 2, Weeks 8-9 Common Interim Assessment (CIA)

Weeks 1-5

Quarter 3, Weeks 1-5

Expressions and Equations: 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.

Key Vocabulary: zero, positive, negative, opposite, pairs, coordinate, plane, axes, absolute value

Standard	Suggested Student Outcomes	Suggested Activities	Materials/Websites
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.	*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.* • I can recognize solving an equation or inequality as a process of answering "which values from a specified set, if any, make the equation or inequality true?" • I can use the solution to an equation or inequality to prove that the answer is correct. • I can use substitution to determine whether a given number in a specified set makes an equation or inequality true. • I can recognize that a variable can represent an unknown number, or, depending on the scenario/situation, any number in a specific set. • I can relate variables to a context. • I can write expressions when solving a real-world or mathematical problem.	Example: Joey had 26 papers in his desk. His teacher gave him some more and now he has 100. How many papers did his teacher give him? This situation can be represented by the equation 26 + n = 100 where n is the number of papers the teacher gives to Joey. This equation can be stated as "some number was added to 26 and the result was 100." Students ask themselves "What number was added to 26 to get 100?" to help them determine the value of the variable that makes the equation true. Students could use several different strategies to find a solution to the problem. (Sample, pp.35-36)	Might Math- Expressions Mighty Math - Equations

	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.	*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.* • I can define an inverse operation. • I can use inverse operations to solve one step variable equations. • I can apply rules of the form x + p = q and px = q, for cases in which p, q and x are all nonnegative rational numbers, to solve real world and mathematical problems. (There is only one unknown quantity). • I can develop a rule for solving one-step equations using inverse operations with nonnegative rational coefficients. • I can solve and write equations for real-world mathematical problems containing one unknown.	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. Students recognize that dividing by 6 and multiplying by produces the same result. For example, = 9 and x = 9 will produce the same result. Beginning experiences in solving equations require students to understand the meaning of the equation and the solution in the context of the problem. (Sample pp.38-39)	
	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.	• I can identify the constraint or condition in a real-world or mathematical problem in order to set up an inequality. • I can recognize that inequalities of the form x>c or x<c have infinitely many solutions. • I can write an inequality of the form x>c or x<c to represent a constraint or condition in a real-world or mathematical problem. • I can represent solutions to inequalities or the form x>c or x<c with infinitely many		

	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	solutions, on the number line diagrams. • I can define independent and dependent variables. • I can use variables to represent two quantities in a real-world problem that change in relationship to one another. • I can write an equation to express one quantity (dependent) in terms of the other quantity (independent). • I can analyze the relationship between the dependent variable and independent variable using tables and graphs. • I can relate the data in a graph and table to the corresponding 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 the standard, pp.41-42	

Weeks 6-7				
	Quarter 3, Weeks 6-7			
	Statistics and Probability: Develop understanding of statistical variability. Summarize and describe distributions. **Key Vocabulary:** range, median, mode, statistical question, variability, center, spread, shape, values			
	Standard	**Suggested Student Outcomes**	**Suggested Activities**	**Materials/Websites**
	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	• I can recognize that data has variability. • I can recognize a statistical question (examples versus non-examples).	The Average Student Bevy of Butterflies IXL Online Activity Buttons Identifying Statistical	Misconceptions Teacher Ideas - NY Videos/Lessons Math Shell

	students' ages. **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.	• I can identify that a set of data has distribution. • I can describe a set of data by its center, e.g., mean and median. • I can describe a set of data by its spread and overall shape, e.g. by identifying data clusters, peaks, gaps and symmetry. • I can recognize there are measures of central tendency for a data set, e.g., mean, median, mode. • I can recognize there are measures of variances for a data set , e.g., range, interquartile range, mean absolute deviation. • I can recognize that measure of central tendency for a data set summarizes the data with a single number. • I can recognize that measures of variation for a data set describe how its values vary with a single number.	Questions	
Weeks 8-9 (and into Quarter 4 as	**Quarter 3, Weeks 8-9**			
	Statistics and Probability: Develop understanding of statistical variability. Summarize and describe distributions. **Key Vocabulary: range, median, mode, statistical question, variability, center, spread, shape, values**			
	Standard	**Suggested Student Outcomes**	**Suggested Activities**	**Materials/Websites**
	6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	• I can identify the components of dot plots, histograms, and box plots. • I can find the median, quartile and interquartile range of a set of data. • I can analyze a set of data to determine its variance. • I can create a dot plot to display a set of	Mighty Math Activities Inside Mathematics	Misconceptions Teacher Ideas – NY Videos/Lessons MathShell

		numerical data. • I can create a histogram to display a set of numerical data. • I can create a box plot to display a set of numerical data.		KhanAcademy American Statistical Org
	6.SP.5.A Summarize numerical data sets in relation to their context by reporting the number of observations.	• I can report the number of observations in a data set or display.		
	6.SP.5.B Summarize numerical data sets in relation to their context describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	• I can organize and display data in tables and graphs. • I can describe the data being collected, including how it was measured and its units of measurement.		
	6.SP.5.C Summarize numerical data sets in relation to their context by 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 was gathered.	• I can calculate quantitative measures of center, e.g., mean, median, mode. • I can calculate measures of variance, e.g., range interquartile range, mean absolute deviation. • I can choose the appropriate measure of central tendency to represent the data.		
	6.SP.5.D Summarize numerical data sets in relation to their context by relating the choice of measures of center and	• I can identify outliers. • I can determine the effect of outliers on quantitative measures of a set of		

	variability to the shape of the data distribution and the context in which the data was gathered.	data, e.g., mean, median, mode, range, interquartile range, mean absolute deviation. • I can analyze the shape of the data distribution and the context in which the data were gathered to choose the appropriate measures of central tendency and variability and justify why this measure is appropriate in terms of the context.		
Note: Quarter 3, Weeks 8-9 Common Interim Assessment (CIA)				
4th Quarter will be utilized for project-based learning to help further students/ understanding. they will be reassessed in all standards throught the projects.				