Ratios & Proportional Relationships
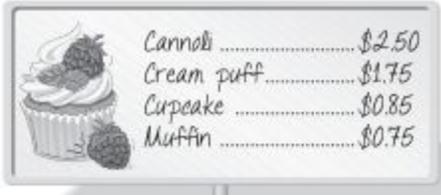
Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.	Write the ratio of circles to stars: ● ● ★ ● ★	The ratio of games the Tigers won to the games they lost is 8:5. What is the ratio of games won to the total number of games played? Explain.	Write three different ratios for the following situation. Explain what the ratios compare. Miley has 2 turtles and 3 fish.
6.RP.A.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.	The baseball coach pays $65 for 12 pizzas. What is the cost per pizza?	Compare and contrast rates and ratios	<table><tr><td></td><td>**Production**</td></tr><tr><td>Factory A</td><td>10,000 cars and 2500 trucks manufactured in 10 months.</td></tr><tr><td>Factory B</td><td>6000 cars and 1200 trucks manufactured in 9 months.</td></tr><tr><td>Factory C</td><td>9000 cars and 1800 trucks manufactured in 8 months.</td></tr></table> Suppose factory A manufactures 500 more cars in their 10 month time frame. How many more trucks would Factory A need to manufacture in those 10 months to equal the rate of total vehicle production at Factory C?

| 6.RP.A.3 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. | Complete the chart below using equivalent ratios: | Explain how you completed the table of equivalent ratios in question below: | |

Complete the chart below using equivalent ratios:

Number of Teachers	4	12	16	24	32
Number of Students	12	?	?	?	?

Explain how you completed the table of equivalent ratios in question below:

Q) For every 12 sit-ups Stan does, he does 8 push-ups. Create a table of equivalent ratios that show the relationship between the number of sit-ups Stan does.

Number of Sit-ups					
Number of Push-ups					

The Number System

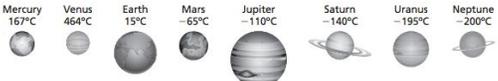| Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.	7/9 ÷ ⅝	Why is ½ of ⅛ different than ½ ÷ ⅛ ? Which is greater: 1/9 ÷ ⅔ or ⅔ ÷ 1/9 ? Explain Why	 **Portion of your time** Going on rides — $\frac{1}{6}$ Waiting in line for rides — $\frac{3}{10}$ Playing games — $\frac{1}{12}$ Swimming in wave pool — $\frac{3}{10}$ Create a problem that would cause you to find the percent out of the total for each activity.
6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.	59,628 ÷ 73	Sometimes a real-world problem involving division has a remainder. To complete the solution, you have to interpret the remainder. Explain why. How could the fact 36 ÷ 6 = 6 help you estimate the quotient of 364,573 ÷ 64?	Cannoli .... $2.50 Cream puff .... $1.75 Cupcake .... $0.85 Muffin .... $0.75 Say that at the end of a fair, there are x number of each item sold. How much more money would the bakery have made if they sold all the desserts?
6.NS.B.3	4.093 8.39	**Write an equation to represent the problem**	Write a real-world problem that can be

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	+3.901 x3.02 ------------ ---------------	**below:** Nina drove 187.68 miles in 3 hours. What was her average speed?	solved by adding (subtracting, multiplying, dividing) two decimals. Then solve the problem.
6.NS.B.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	Find the GCF of 54 and 12.	How do you know that the equation 54 + 12 = 6(9+2) is true?	You are buying fruit to make fruit baskets for a craft fair. Apples come in bags of 20. Oranges come in bags of 16. Bananas come in bags of 32. There must be at least 5 but no more than 10 of each type of fruit in each basket. How many different ways can you arrange the fruit baskets when using all of the fruit? Explain your reasoning.

numbers with no common factor.			
6.NS.C.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.	Complete the number line below: -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	Write an integer to represent the example below. Explain the meaning of 0 in the situation. *82 meters above sea level*	Evaluate: Jimmy claims that 3 and -3 are the same value. Is Jimmy correct? Explain
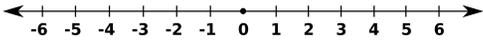
6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	Show on a number line where +4 is located? Or -3?	**Vienna, Austria**	Using the same chart from the left, in which quadrant are there no points plotted? Explain why this occurs.

| 6.NS.C.6 ... | Show on a number line where +4 is located? Or -3? | Plot all the ordered pairs (high,low) in a coordinate plane. Find 2 ordered pairs that differ only by signs. What do you notice about the location of the points in relation to the axes? | Using the same chart from the left, in which quadrant are there no points plotted? Explain why this occurs. |

Vienna, Austria table:

Day	M	Tu	W	Th	F	Sa	Su
High temperature (°C)	8	9	4.5	9	8.5	1	5
Low temperature (°C)	0	−4.5	−12	4.5	−6	−10	−14

| 6.NS.C.7 Understand ordering and absolute value of rational numbers. | What is the absolute value of 2? Of -10? | Which is further away from zero - 20 or -20? Why? | Mercury 167°C Venus 464°C Earth 15°C Mars −65°C Jupiter −110°C Saturn −140°C Uranus −195°C Neptune −200°C

Your friend orders the planets from least mean temperature to greatest mean temperature. That friend says you can simply do this by just ordering the planets according to their distance from the sun. Is your friend correct? Explain. |

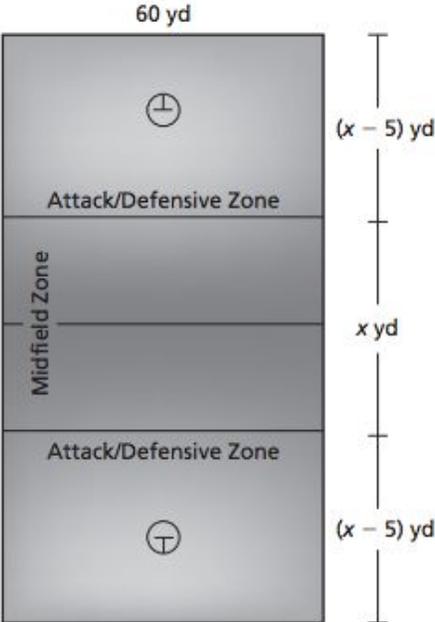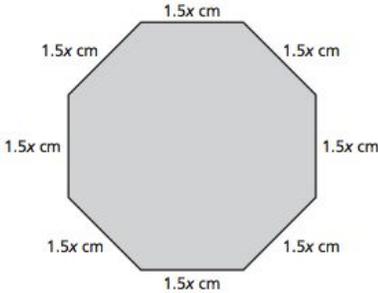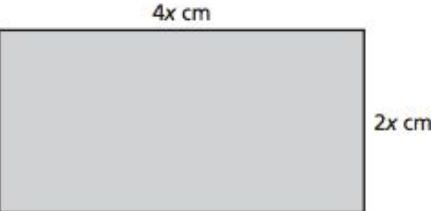| 6.NS.C.8 Solve real-world and mathematical problems by graphing points in all | Plot x numbers of ordered pairs on a coordinate plane. | If a starting point is located at (6,-4), which ordered pair is closer to it - (6,0) or (1,-4)? | |

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.			

Expressions and Equations

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.	9^2	Explain how to use the order of operations to evaluate the expression: $2 ⩓ 2 + 2 \times 2^2 - 2$	A school band has 75 members. Write and evaluate an expression to find the number of band members in each formation. One part of the formation has 7 rows with 7 band members per row. Another part of the formation has 4 rows with 4 members per row. The last part has 3 rows with 3 members per row.
6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.	Write as an algebraic expression: The product of length *l* and the width *w* The sum of twice the length *l* and twice the width *w*	Find the area and perimeter of the base of a rectangular prism that has dimensions of 2 by 2 by 3.	 20 in. 20 in. 20 in. One cubic inch of sand weighs about 1 ounce. Find the weight of the treasure chest, in pounds, after it is filled with sand. Assume that the chest weighs about 20 pounds when empty.
6.EE.A.3 Apply the properties of operations to generate equivalent expressions. *For example,*	Simplify. 4(3x+5) 5x -7(8x-4) +3x	Write and simplify the expression for the perimeter of a football field with the length equal to twice the width.	

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.			 If the Midfield zone is 2400 square feet, how much sod is needed to replace the attach/defensive zone?
6.EE.A.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).	 What is the expression for the perimeter of the octagon?	Why does 6x + 4x = 10x? For what values of x does this prove true?	 For what values of x could the sides of a triangle equal so it has the same perimeter as the rectangle?

6.EE.B.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.	Solve for x. 2x+8>10 4x=14	Which of these make the inequality true? 2x+8>10 {-1, 0, 1, 2, 3}	The maximum weight for a carry-on bag is 40 lbs. Your bag currently weighs 22 lbs. Write and solve an inequality to figure out how much weight you can add to the bag without going over the limit.
6.EE.B.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	Write the phrase as an algebraic expression: 16 more than a number q A number x divided by 4, then subtracted from 10	Simplify the expressions. 10 + (a+9) 5(4n) 12(2y-3)	Jose is x years old. His brother, Felipe, is 2 years older than Jose. Their aunt, Maria, is three times as old as Felipe. Write and simplify and expression that represents Maria's age in year. Then find the ages of all three people. You buy a basket of 24 strawberries. You eat them as you walk to the beach. It takes the same amount of time to walk each block. When you are halfway there, half of the berries are gone. After walking 3 more blocks, you still have 5 blocks to go.

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hand, any number in a specified set.			You reach the beach 28 minutes after you began. One-sixth of your strawberries are left. Is there enough information to find the time it takes to walk each block? Explain. If not, what other information do you need?
6.EE.B.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.	Write and solve the equations. The sum of a number and x equals 12. 5 is one-fourth of a number c.	Students and faculty raised $6042 for band uniforms. The faculty raised $1780. Write and solve an equation you can use to find the amount a raised by the students. Tell whether the given value is a solution of the equation. P + 10 = 38; p=18	Explain why the equations x+4=13 and 4+x=13 have the same solution. On Saturday, you spend $33, give $15 to a friend, and receive $20 for mowing your neighbor's lawn. You have $21 left. Use two methods to find how much money you started with that day.
6.EE.B.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	From two different inequalities graphed on a number line, which one represents x>1 and which represents x≥1? Why?	Write and graph an inequality for these situations: The truck can carry no more than 3600 lbs. To be worth its cost, a flight must be greater than 500 miles.	You run a bakery that sells cookies, cupcakes, and cakes. You can make either 10 cookies, 5 cupcakes, or 1 cake with 1 pound of flour. Today, you have made 10 cakes and 40 cupcakes, which is 18 of your 40 lbs of flour. How many cookies can you make without using all or the rest of your flour?

solutions; represent solutions of such inequalities on number line diagrams.			
6.EE.C.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	Is the ordered pair a solution of the equation? y=7x ; (2,21)	Knowing that the perimeter of a square if 4 times its side length, write a formula for the perimeter of a square. Tell what each variable represents. The equation y=10x+25 gives the amount y (in dollars) in your savings account after x weeks. Identify the independent and dependent variables. How much is in your savings account after 8 weeks?	Describe how the perimeter of a square changes as its side length increases by 1 unit. Give an example of a real-life situation that you can model by an equation in two variables.

equation.			

Geometry

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
6.G.A.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.	Find the areas of: A triangle with base of 3 and height of 4 A trapezoid with bases of 20 and 24, and a height of 9. A parallelogram with base of 12 and height of 6.	If the area of a triangle is 24 square inches and the height is 12 inches, what is the base?	You have an unusually shaped back yard. The side closest to your house is 12 feet long; the side furthest from your house is 15 feet long. The distance between the two sides is 4 feet, but on one end the two sides are connected diagonally. Draw this figure. If it takes you 3 bags of grass seed to cover 1 square foot of the yard, how many bags will you need the cover the entire yard?
6.G.A.2 Find the volume of a right rectangular prism with fractional edge	Find the volume of a cube with and edge length of ¾ meters. Find the volume of a rectangular prism with length of 4/3 inches, a width of ¾ inches and a height of ⅚ inches.	If the volume of a kleenex box is 1375 cubic centimeters and its length is 20 cm and its height is 5 ½ cm, what is its width?	How many 1-inch cubes do you need to fill a cube that has an edge length of 1 foot? How can this result help you convert a volume from cubic inches to cubic feet? And from cubic feet to cubic inches?

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.			You have 1400 square feet of boards to use for a new tree house. Design a tree house that has a volume of at least 250 cubic feet. Draw the sketch. Are your dimensions reasonable? Explain.

| 6.G.A.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. | Draw the polygon on a coordinate plane with these ordered pairs: (0,0) (5,7) and (7,4) | Draw the polygon in a coordinate plane and then find the perimeter and area. (1,6) (7,6) (1,2) and (7,2) | The vertices of a backyard are W(10,30), X(10,100), Y(110,100) and Z(50,30). The coordinates are measured in feet. The line segment XY separates the backyard into a lawn and a garden. The area of the lawn is greater than the area of the garden. How many times larger is the lawn than the garden? What are both areas? Are there any other methods to separate the backyard to achieve the same area? |

6.G.A.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.	Find the number of faces, edges and vertices of the solid. Find the surface area of the rectangular prism.	Draw the front, side and top views of the stacks of cubes. Then find the number of cubes in the stack.	Two of the three views of a solid are shown. What is the greatest number of unit cubes in the solid? What is the least number? Draw the front views. Can you form a square pyramid using four of the triangles shown? Explain your reasoning.
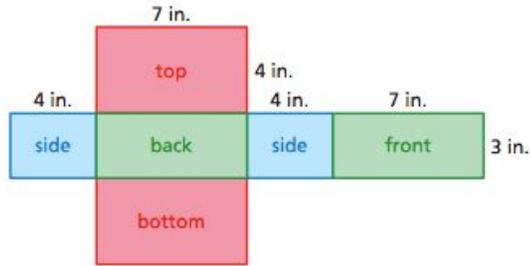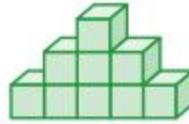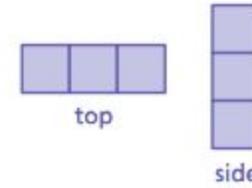
Statistics & Probability

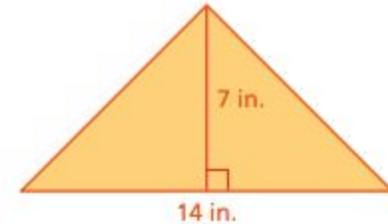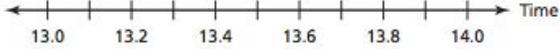| Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	Determine whether the question is a statistical question. Explain. • What is the eye color of sixth grade students? • At what temperature (in degrees Fahrenheit) does water freeze?	 The dot plot shows the times of sixth grade students in a 100-meter race. - How many students ran the race? - How can you collect these data? What are the units?	Using the dot plot to the left, write a statistical question that you can answer. Then answer the question. "How many letters are in the English alphabet?" is not a statistical question. Write a question about letters that IS a statistical question. Explain your reasoning.
6.SP.A.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.	Find the mean of a set of data. What is the difference between a histogram and a bar graph?	Find the mean, median and mode of a set of data. Which measure would best represent the data and explain why. Find the and interpret mean absolute deviation of a set of data.	Create two different sets of data that have six values and a mean of 21. Explain to another student how to find any outliers in a set of data. Consider a data set that has no mode. Which measure of variation is greater, the range or the interquartile range? Explain.
6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes	Identify the outlier in a set of data.	Make a dot plot of the data set: 11, 13, 17, 15, 12, 18 and 12. Use the dot plot to explain how the mean is the point where the data set is balanced.	How does adding in one more number to a set of data change its mean? Median? Mean Absolute Deviation? Why do you think the mode is the least frequently used measure to describe data sets? Explain.

all of its values with a single number, while a measure of variation describes how its values vary with a single number.			
6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	Make a back to back stem and leaf plot for two sets of data. Draw a histogram or box and whisker plot for a set of data.	 Describe and correct the error in making the stem and leaf plot. The weights, in pounds, of eight puppies at a pet store are: 12, 24, 17, 8, 18, 31, 24 and 15. Make a stem and leaf plot and describe the distribution of the data.	 What kinds of statements can you make using this histogram?
6.SP.B.5 Summarize numerical data sets in relation to their context.	Describe the shape of distribution of any data set.	What do you notice about the means and medians of data sets and their shapes of distributions? (Pertaining to any data set) What are the most appropriate measures to describe the center and the variation?	Why do you think some distribution is called skewed? Can you use a stem and leaf plot to describe the shape of a distribution? Explain.

Grade 6 Math Common Core State Standards

Ratios & Proportional Relationships

Understand ratio concepts and use ratio reasoning to solve problems.

CCSS.MATH.CONTENT.6.RP.A.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."*

CCSS.MATH.CONTENT.6.RP.A.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]

CCSS.MATH.CONTENT.6.RP.A.3 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.

CCSS.MATH.CONTENT.6.RP.A.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.

CCSS.MATH.CONTENT.6.RP.A.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?*

CCSS.MATH.CONTENT.6.RP.A.3.C times the quantity); solve problems involving finding the whole, given a part and the percent.

CCSS.MATH.CONTENT.6.RP.A.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

[1] Expectations for unit rates in this grade are limited to non-complex fractions.

The Number System

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

CCSS.MATH.CONTENT.6.NS.A.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 mi?*.

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Grade 6 Math Question Stem Bank: Common Core State Standards
Standards for Mathematical Practice

Compute fluently with multi-digit numbers and find common factors and multiples.

CCSS.MATH.CONTENT.6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.
CCSS.MATH.CONTENT.6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
CCSS.MATH.CONTENT.6.NS.B.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)..*

Apply and extend previous understandings of numbers to the system of rational numbers.

CCSS.MATH.CONTENT.6.NS.C.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.
CCSS.MATH.CONTENT.6.NS.C.6 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.

    CCSS.MATH.CONTENT.6.NS.C.6.A 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.
    CCSS.MATH.CONTENT.6.NS.C.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.
    CCSS.MATH.CONTENT.6.NS.C.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.
CCSS.MATH.CONTENT.6.NS.C.7 Understand ordering and absolute value of rational numbers.
    CCSS.MATH.CONTENT.6.NS.C.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 -3 is located to the right of -7 on a number line oriented from left to right.*
    CCSS.MATH.CONTENT.6.NS.C.7.B Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3 oC > -7 oC to express the fact that -3 oC is warmer than -7 oC.*
    CCSS.MATH.CONTENT.6.NS.C.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.*
    CCSS.MATH.CONTENT.6.NS.C.7.D Distinguish comparisons of absolute value from statements about order. *For example,*

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recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.

CCSS.MATH.CONTENT.6.NS.C.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.

Expressions & Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

CCSS.MATH.CONTENT.6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.
CCSS.MATH.CONTENT.6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.
  CCSS.MATH.CONTENT.6.EE.A.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*.
  CCSS.MATH.CONTENT.6.EE.A.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*.
  CCSS.MATH.CONTENT.6.EE.A.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 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*.
CCSS.MATH.CONTENT.6.EE.A.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*.
CCSS.MATH.CONTENT.6.EE.A.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.*.

Reason about and solve one-variable equations and inequalities.

CCSS.MATH.CONTENT.6.EE.B.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.
CCSS.MATH.CONTENT.6.EE.B.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.

CCSS.MATH.CONTENT.6.EE.B.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.

CCSS.MATH.CONTENT.6.EE.B.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.

Represent and analyze quantitative relationships between dependent and independent variables.

CCSS.MATH.CONTENT.6.EE.C.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.*

Geometry

Solve real-world and mathematical problems involving area, surface area, and volume.

CCSS.MATH.CONTENT.6.G.A.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.

CCSS.MATH.CONTENT.6.G.A.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.

CCSS.MATH.CONTENT.6.G.A.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.

CCSS.MATH.CONTENT.6.G.A.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.

Statistics & Probability

Develop understanding of statistical variability.

Kids at the Core

Grade 6 Math Question Stem Bank: Common Core State Standards
Standards for Mathematical Practice

CCSS.MATH.CONTENT.6.SP.A.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*.

CCSS.MATH.CONTENT.6.SP.A.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.

CCSS.MATH.CONTENT.6.SP.A.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.

Summarize and describe distributions.

CCSS.MATH.CONTENT.6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

CCSS.MATH.CONTENT.6.SP.B.5 Summarize numerical data sets in relation to their context, such as by:

CCSS.MATH.CONTENT.6.SP.B.5.A Reporting the number of observations.

CCSS.MATH.CONTENT.6.SP.B.5.B Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

CCSS.MATH.CONTENT.6.SP.B.5.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.

CCSS.MATH.CONTENT.6.SP.B.5.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.

Kids at the Core