Grade 6 – Standard Review

NATIONAL TRAINING NETWORK

2018

Name	Understand ratio concepts and use ratio reasoning to solve problems.

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."*

Question 1:

A set of marbles contains 5 green marbles and 10 blue marbles.

a. What is the ratio of green to blue marbles? Write the ratio in three forms.

b. What is the ratio of green marbles to all marbles? Write the ratio in three forms.

Question 2:

Gail is making a batch of her snack mix. The recipe is provided.

a. What is the ratio of candy to peanuts?

b. What does this ratio mean?

c. What is the ratio of peanuts to total ingredients?

d. What does this ratio mean?

Gail's Snack Mix
6 cups peanuts
2 cups colored candies
1 cup raisins
1 cup chocolate chips
Yields 10 cups

Name	Understand ratio concepts and use ratio reasoning to solve problems.

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 ¾ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."(*Expectations for unit rates in this grade are limited to non-complex fractions).

Question 1:

Three cans of tuna costs $1.50.

a. What is the cost of one can of tuna?

b. What is being compared?

c. Is the ratio a unit rate? Explain your answer.

Question 2:

Marcy drove 260 miles in 4 hours. Katie drove 408 miles in 6 hours. Determine the unit rate of each driver. Who is driving at a faster speed? Justify your answer.

Name	Understand ratio concepts and use ration reasoning to solve problems.

6.RP.A.3a
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.

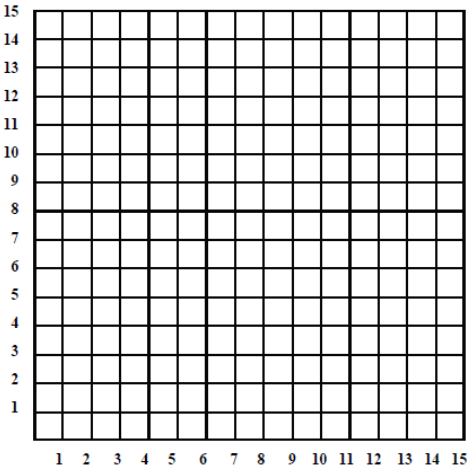
Question 1:

The student council is trying to determine where to purchase pizza for the 6th grade dance. Complete both tables. Identify the unit rate per pizza for each Pizza Shop. If they student council needs to order 21 pizzas, which Pizza Shop has the best price and how much will they save?

Shop #1	(# of Pizzas)	3	6		12		18		24
	Cost in $	15		45					
Shop #2	(# of Pizzas)	3	6		12			21	
	Cost in $	21		63					

Question 2:

Mrs. Banks charted the information about the reading contest between the boys and girls. If both groups are reading at a constant rate per day, complete the chart and then plot the pairs of values on the coordinate plane.



Mrs. Bank's Homeroom			
Boys		Girls	
Day	Books Read	Day	Books Read
1	2	1	3
2		2	
3	6	3	9
4		4	12
5	10	5	

Name	Understand ratio concepts and use ration reasoning to solve problems.

6.RP.A.3b
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?*

Question 1:

On Wednesday, Jackie earned $21.00 for 3 hours of babysitting. On Saturday, she babysat for the same family and earned $56.00. How many hours did she babysit for on Saturday? What does Jackie charge per hour for babysitting? Explain how you determined your response.

Question 2:

At the store, a package of four AA batteries costs $3.92. A package of eight of the same batteries cost $7.60.

a.) Which package is the better buy? Justify your answer.

b.) If you needed to purchase 16 batteries, how much money would you save by purchasing the package of batteries that is a better buy? Show your work and explain your answer.

Name	Understand ratio concepts and use ration reasoning to solve problems.

6.RP.A.3c
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.

Question 1:

Scott answered 18 out of the 20 questions on his homework assignment correctly. What percent of the questions did he miss?

Create a model to defend your answer.

Question 2:

15% of the students in the Marching Band wear glasses. If 12 students wear glasses, how many students are in the Marching Band? Justify your answer with a model.

Name	Understand ratio concepts and use ration reasoning to solve problems.

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

Question 1:

A restaurant used 15 pounds of ground beef to make hamburgers for the day. How many burgers did they make if each burger is 6 ounces? (16 ounces = 1 pound) Explain your answer and show all conversions.

Question 2:

Michelle and Rosa are researching the deepest lakes in the United States for a school project. Lake Tahoe has a depth of 1644 feet. What is the depth of the lake in meters? (3 feet = 1 yard; 1 yard ≈ 0.91 meters). Use a two step conversion to model your answer.

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

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?*

Question 1:

Hector has $\frac{7}{8}$ of a pound of leftover Halloween candy. He plans on giving it away to his friends. If he plans on giving each person $\frac{1}{16}$ of a pound, how many people can he give to? Show your work.

Question 2:

Natasha's uncle has a rectangular field that has an area of $\frac{5}{8}$ square mile. The width of the field is $\frac{1}{4}$ mile. How long is the field? Show your work.

Name	Compute fluently with multi-digit numbers and find common factors and multiples.
6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.	
Question 1: What is the quotient of 3,528 and 42?	
Question 2: Mr. Rodriguez has 8 packs of pencils to divide equally among his class of 26 students. If each pack contains 15 pencils, how many pencils will each student receive? How many will be leftover? Show your work.	

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

6.NS.B.3
Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

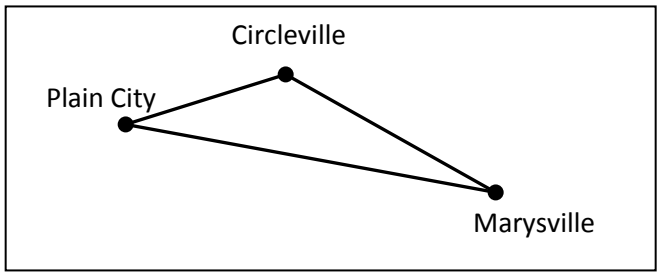
Question 1:

Use the map and the following information for the question below.

From Plain City to Circleville is 4.23 miles.

From Circleville to Marysville is 11.48 miles.

From Plain City to Marysville is 13.2 miles.



Nevaeh lives in Plain City, but works in Marysville. Her grandmother lives in Circleville. Everyday, she goes to visit her grandmother after work, rather than going straight home. How much farther does she drive by each week by visiting her grandmother? Show your work.

Question 2:

Isabella has found that she stays in better shape by running various distances and terrains throughout the week. On Mondays she runs 2.5 miles, on Tuesdays 4.6 miles, on Thursdays 6.75 miles, and on Saturdays 2.75 miles. What is the average distance Isabella runs per day?

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

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).

Question 1:

In a promotion at a local diner, every twelfth customer will get a free hamburger and every ninth customer will get a free milkshake. Which customer will be first to get both a free sandwich and a free drink? Show your work.

Question 2:

Find the greatest common factor of 54 and 72. Use a model to justify your answer.

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

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.

Question 1:

Place the following words in the table based on what type of integer would best represent them.

Below, After, Deposit, Ascended, Loss, Withdrawal, Drop, Descended, Rise, Gain, Above, Before

POSITIVE	NEGATIVE

Question 2:

The lowest point in the United States is located in Death Valley and is 282 below sea level. The highest point in the United States is Mt. McKinley, which is 20,236 feet above sea level. Use integers to represent the elevation of these landmarks.

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

6.NS.C.6a
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.

Question 1:

Write the opposite of each integer and then graph them on the number line.

a.) ⁻4 b.) 17 c.) ⁻11 d) 8

Question 2:

What is the opposite of the opposite of 28? How does this compare to the original number? Explain your answer using pictures or a number line.

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

6.NS.C.6b
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.

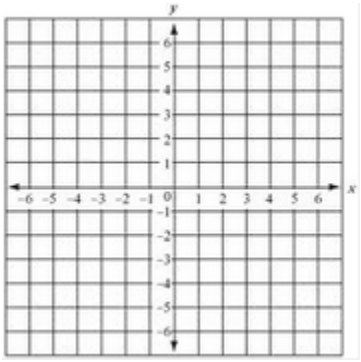
Question 1:

Fill in the table below to indicate whether the coordinates are positive or negative integers based on which quadrant they are located in.

	x coordinate	*y* coordinate
Quadrant 1		
Quadrant 2		
Quadrant 3		
Quadrant 4		

Question 2:

Plot the point (5, ¯2) on the coordinate plane below and label it 'A.' Which quadrant is it located in?



Reflect Point A over the *x*-axis. What are the coordinates of the reflected point? Which quadrant is the reflected point in? Explain the relationship between this point and the original point.

Now reflect Point A over the *y*-axis. What are the coordinates of the reflected point? Which quadrant is the reflected point in? Explain the relationship between this point and the original point.

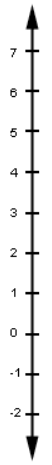
Name	Apply and extend previous understandings of numbers to the system of rational numbers.

6.NS.C.6c
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.

Question 1:

Graph the following numbers on the vertical number line.

$2, \frac{-1}{2}, 4, {}^{-}2, 5\frac{1}{2}$



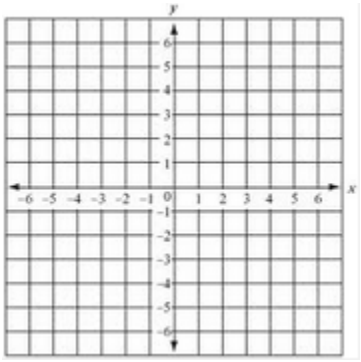
Question 2:

Plot and label the following points on the coordinate plane below.

A (4, 1) B (¯3, 0)

C (¯5, ¯4) D (2, ¯6)

E (0, ¯1) F (¯2, 4)



Explain how you determined where to place the points based on the sign of the coordinate.

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

6.NS.C.7a
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.*

Question 1:

Plot the following on the number line.

$^{-}12, 7, 2, {}^{-}16, {}^{-}9, 0$

Using the number line, write < or > to compare the following.

a.) $^{-}12$ ____ $^{-}16$

b.) $^{-}16$ ____ $^{-}9$

c.) 2 ____ $^{-}12$

Question 2:

Is $^{-}84$ to the left or to the right of $^{-}75$ on the number line? _____ Explain what this means in terms of the value of the integers. Write an inequality that compares the two integers.

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

6.NS.C.7b
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.*

Question 1:

The average January temperatures for four cities in Alaska are listed below. Write the temperatures in order from coldest to warmest.

City	Temperature in January (Fahrenheit)
Anchorage	15 degrees
Barrow	¯13 degrees
Fairbanks	¯10 degrees
Juneau	24 degrees

Question 2:

In golf, the player with the lowest score wins. At a local tournament, Bobby's score was ¯4, Paul's score was 1, Greg's score was 0, and Vince's score was ¯2. Who won the tournament? List the players in their finishing order.

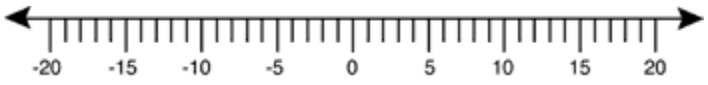
Name	Apply and extend previous understandings of numbers to the system of rational numbers.

6.NS.C.7c
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.*

Question 1:

Identify the two values that have the absolute value of 15.

Graph those values on the number line.



Question 2:

What is the difference between the opposite of a number and its absolute value? Identify two values that you can use for an example and explain the difference using a number line or similar model.

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

6.NS.C.7d
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.*

Question 1:

Alan received his bank statement in the mail and has a balance of ¯40 dollars. Abby got her credit card statement and is being told she owes 45 dollars. Who has the greater debt? Explain your answer.

Question 2:

Mine A is 225 feet underground and Mine B has an elevation of ¯232 feet. Which mine is further underground? Show your work and justify your answer using a model.

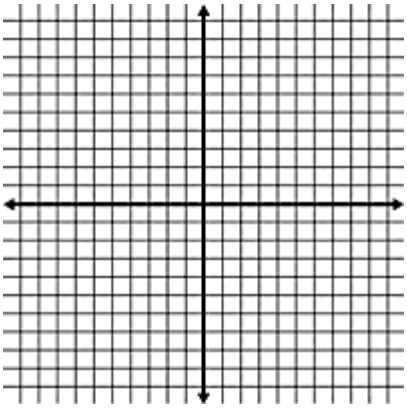
Name	Apply and extend previous understandings of numbers to the system of rational numbers.

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.

Question 1:

Madison is using this coordinate plane to map out a square garden in her backyard. The vertices of the garden will be at A:(¯2, ¯5), B:(¯2, 3), C:(6, ¯5), and D:(6, 3). Add the scale and axes to the graph. Plot the points on the coordinate plane.

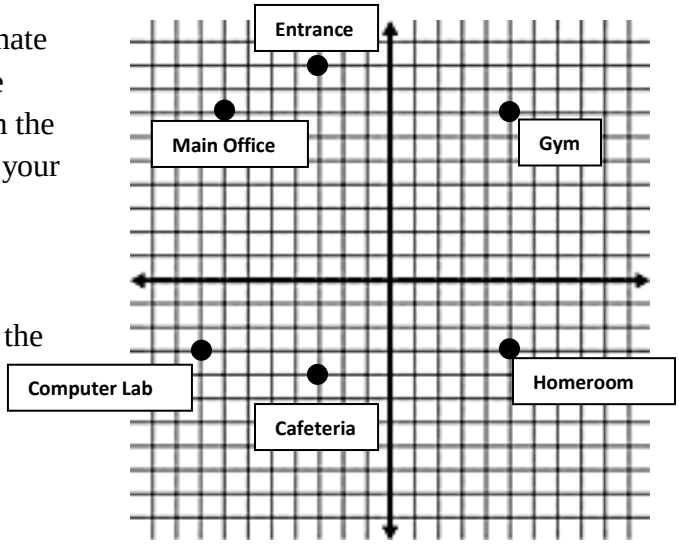
If 1 unit = 1 foot, what is the vertical distance from Point A to Point B. Explain how you determined the distance using the points and the graph



Question 2:

Tyson drew a map of school on the coordinate plane shown. Add the scale and axes to the graph. If 1 unit = 35 feet, how far is it from the Computer Lab to his Homeroom? Explain your answer using the points and the graph.

How far is it from the school's entrance to the Cafeteria? Explain your answer using the points and the graph.



Name	Apply and extend previous understanding of arithmetic to algebraic expressions.

6.EE.A.1

Write and evaluate numerical expressions involving whole-number exponents.

Question 1:

Determine the value of the following expressions. Explain your answers and show all work.

a.) 0.4^2

b.) $5^2 - 3 \times 6 + 14$

c.) $22 + 3^3 - 12$

Question 2:

A square has a side length of 6 meters. Write the area of the square using a whole number exponent. Explain your thinking.

a.) 6 meters 

b.) $3^x = 81$ What is the value of x in the given expression? Justify your response.

Name	Apply and extend previous understanding of arithmetic to algebraic expressions.

6.EE.A.2a
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*.

Question 1:

Translate the following into algebraic expressions.

a.) Nineteen less than a number, *y*

b.) The product of twelve and a number, *n*, added to the sum of sixty-seven and thirty-two

c.) The quotient of a number, *x*, and the difference of ten and two

Question 2:

Jane went to the mall and bought 2 pairs of jeans for *j* dollars each and 3 shirts for *s* dollars each. Write an algebraic expression that shows how much Jane spent at the mall.

Name	Apply and extend previous understanding of arithmetic to algebraic expressions.

6.EE.A.2b

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.

Question 1:

In the expression, $x^2 + 3m + 4n - 7$

a.) How many terms are there?

b.) What are the coefficient(s)?

c.) What are the variable(s)?

d.) What are the constant(s)?

Question 2:

Write an algebraic expression that satisfies the following conditions.

a.) A product of 2 variables

b.) The sum of two terms multiplied by a variable

c.) The quotient of a variable and a product, minus a constant

Name	Apply and extend previous understanding of arithmetic to algebraic expressions.

6.EE.A.2c

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* $V = s^3$ *and* $A = 6\ s^2$ *to find the volume and surface area of a cube with sides of length* $s = ½$.

Question 1:

The school band wants to order T-shirts for the pep rallies this fall. They used the expression $C = 12t + 25$, where C equals the total cost and t equals the number of T-shirts ordered. If there are 45 students in the band, how much will the T-shirt order cost? Evaluate the expression and show all work.

Question 2:

Evaluate the following expressions.

a.) $8(y - 14)$ for $y = 20$

b.) $8y - 14$ for $y = 20$

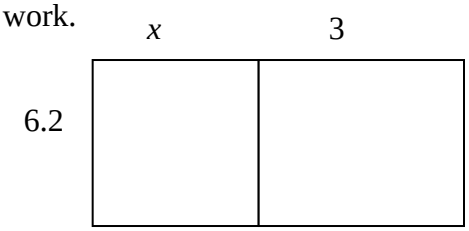
Why are the answers not the same? Explain and show all work.

Name	Apply and extend previous understanding of arithmetic to algebraic expressions.

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.

Question 1:

Find the area of the following shape using the length of (x + 3) and the width of 6.2. Explain your answer and show your work.



Question 2:

Simplify the following expressions to create an equivalent expression. Explain your work and show each step.

a.) 6 + 2(m + 4) + 8m

b.) 3(x + 2) + 4x + 6

Name	Apply and extend previous understanding of arithmetic to algebraic expressions.

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.*

Question 1:

Are the following expressions equivalent? Explain why or why not and justify your answer.

$3x + 2 + 5x + 4$ and $2(4x + 3)$

Question 2:

Are the following expressions equivalent? Explain why or why not and justify your answer.

$y + y + y + y$ and $4y$

Name	Reason about and solve one-variable equations and inequalities.

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.

Question 1:

Determine whether the given number is a solution of the equation. Explain your thinking and show all work for the problem.

a.) $72 = x - 23; x = 105$

b.) Susan has read 84 pages in her book. The book has a total of 152 pages. How many pages does she have left to read? Write an equation and solve a model to justify your answer.

Question 2:

Of the numbers 12, 13 and 14, which would not be included in the solution set for the inequality below? List all possible answers and show your work.

$$7n \geq 91$$

Name	Reason about and solve one-variable equations and inequalities.

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.

Question 1:

Write an expression to represent the following situations

a.) Sophia has *b* bracelets and gave away 5 to her friend, Lola

b.) Ellen divvied up her collection of *g* dolls to her 3 little sisters

Question 2:

Write a situation that the following expressions could represent.

a.) $12 + y$

b.) $9n$

Name	Reason about and solve one-variable equations and inequalities.

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.

Question 1:

Write an equation that represents the following problem and then solve. Justify your answer using a model.

A monarch butterfly flies about 80 miles in one day. So far, it has flown 45 miles. How much father will it fly before the day is over?

Question 2:

Write an equation that represents the following problem and then solve. Show your work.

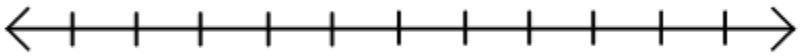
At the city aquarium, there are 12 times as many displays of freshwater fish as saltwater fish. Jun and Kai counted 72 freshwater fish displays on their last field trip there. How many saltwater displays are there?

Name	Reason about and solve one-variable equations and inequalities.

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.

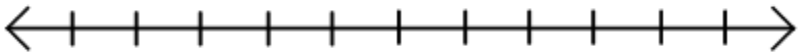
Question 1:

The National Hurricane Center issues a hurricane warning if sustained winds of at least 74 miles per hour are expected in a coastal area. Write an inequality showing the wind speeds when a hurricane warning is issued. Graph the solution on the number line below.



Question 2:

Yankee Stadium can seat no more than 51,000 people. Write an inequality to show the attendance possible at a Yankees game. Graph the solution on the number line below.



Name	Represent and analyze quantitative relationships between dependent and independent variables.

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.*

Question 1:

Fill in the table below. Then, write the equation to show the relationship between the two variables.

m	**0**	**1**	**2**	**3**	**4**	**5**
n	**3**	**6**	**9**	**12**		

Question 2:

In the following table, the relationship between the number of problems correct and the student score is displayed. Explain the relationship between the two variables (*p* and *s*) and write an equation to represent that relationship.

p (problems correct)	**1**	**2**	**5**	**7**	**8**	**10**
s (score)	**10**	**20**	**50**	**70**	**80**	**100**

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

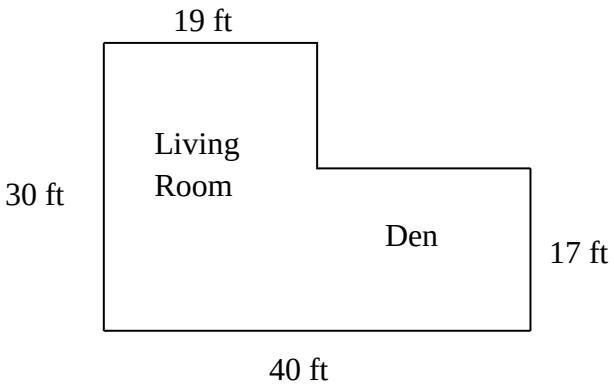
6.G.A.1
Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Question 1:

Mary and her sister, Lori, just bought a new sailboat and the sails need replacing. The sails are in the shape of right triangles, both of which are 21 feet high. The first sail has a base of 10 feet and the second sail has a base of 13 feet. How much fabric will the girls need if they are going to replace both sails? Create a model and defend your answer using the model.

Question 2:

Mr. and Mrs. Smith are going to replace the carpeting in their living room and den shown below. How much carpeting will they need? Explain how you would divide the polygon and determine the total area.

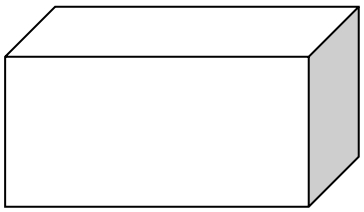


Name	Solve real-world and mathematical problems involving area, surface area, and volume.

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.

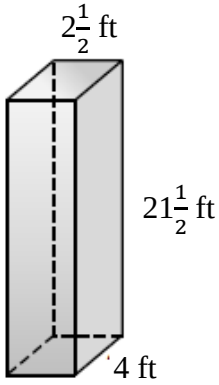
Question 1:

A right rectangular prism has the following measurements: length: $2\frac{1}{2}$ inches, width: 1 inch, height: 1 inch. How many cubes with side lengths of $\frac{1}{2}$ inch would fill the prism? What is the volume of the prism? Justify your answer by using the model below.



Question 2:

What is the volume of the rectangular prism? Show all work and explain your thinking.



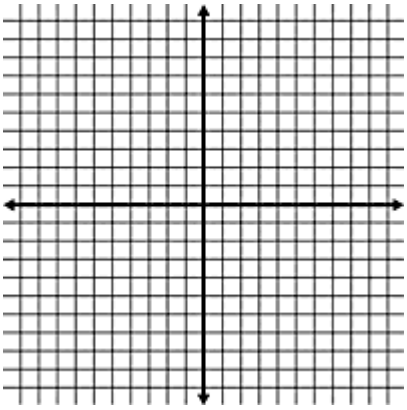
Name	Solve real-world and mathematical problems involving area, surface area, and volume.

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.

Question 1:

Plot the following points on the coordinate plane to create a polygon. Add the scale and the axes to the graph. Identify the polygon. Find the length of side AB. Explain how you determined the length.

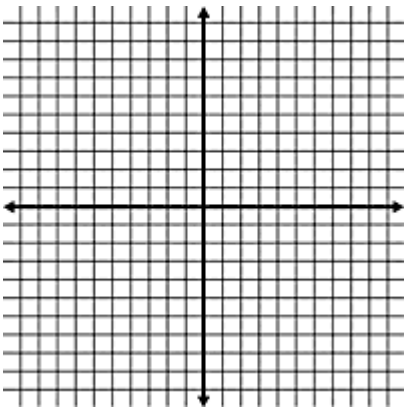
A (3,-5); B (-6, -5); C (3, 3); D (-2, 3)



Question 2:

Maria is using this coordinate plane to help her plan the school's new garden project. She plotted the following points as the vertices of the garden. What shape will the garden be? Add the scale and the axes to the graph.

A (-7, 4); B (3, 7); C (3, -2); D (-7, -5)



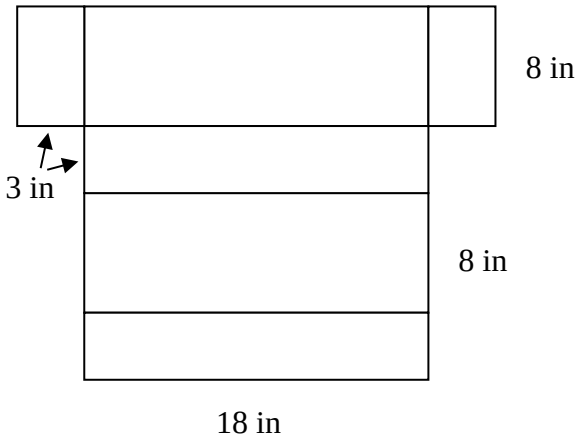
What is the length of side AD? Explain how you determined the length.

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

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.

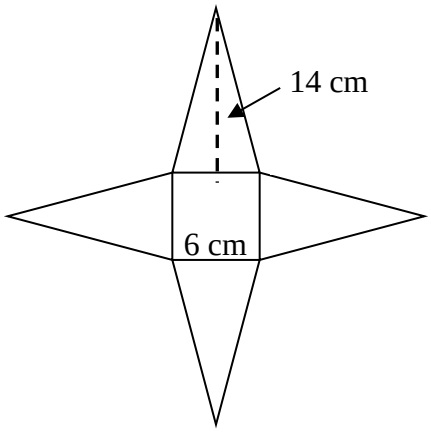
Question 1:

How many square inches of cardboard would be needed to create this box? Explain how to use the net to determine the surface area. Show all work.



Question 2:

Find the surface area of the pyramid. The base of the pyramid is a square and the sides are triangle. Explain how you can use the net to determine the surface area. Show all work.



Name	Develop understanding of statistical variability.

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.

Question 1:

Identify the following questions as statistical or non-statistical.

a.) What are the heights of the students in my class?
b.) How much does Jacob weigh?
c.) What month was Erin born in?
d.) What were the grades on the math quiz last week?
e.) How much money did my family spend on groceries last week?

Question 2:

Explain the difference between a statistical and non-statistical question. Re-write any non-statistical questions from Question 1 as statistical questions.

Name	Develop understanding of statistical variability.

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.

Question 1:

The math quiz scores from Joe's class last week are:

89, 85, 88, 91, 87, 93, 92, 88, 83, 95, 84, 94, 78, 92, 84, 91, 98, 86, 77, 89, 87, 86, 93, 79, 77 and 90

Create a dot plot of this data. Describe the overall shape of the data. Identify the peak of the data set and explain the meaning of the median in relation to his scores.

Question 2:

The follwing table shows the number of times per day that students go to their lockers.

Student Locker Visits								
2	2	0	1	2	2	5	4	0
5	2	5	2	5	2	4	2	4
6	4	5	6	5	6	2	2	0
1	4	5	10	4	1	5	2	6

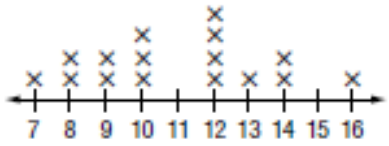
Create a box plot of this data. Identify the Quartiles of the data set and describe the data using the median.

Name	Develop understanding of statistical variability.

6.SP.A.3
Recognize that a measure of center for a numerical data set summarizes all its values with a single number, while a measure of variation describes how its values vary with a single number.

Question 1:

The line plot below shows the number of points Isaiah scored in each of his basketball games last season.



Find the median and the mean of the data. Show your work. Explain what these values represent and how they compare.

Question 2:

Find the mean absolute deviation of the data from Question 1. Show your work. What does this value represent? How can the mean absolute deviation be used when describing the variability of the data?

Name	Summarize and describe distributions

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

Question 1:

Create a frequency table and histogram using the following data.

Number of species in major U.S. Zoos				
200	700	290	600	681
300	643	350	794	400
360	600	134	200	800
305	384	500	330	250
530	715	303	200	475
465	340	347	300	708

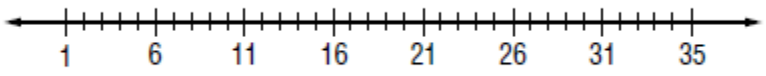
Species	Tally	Frequency
101-200		
201-300		
301-400		
401-500		
501-600		
601-700		
701-800		

Question 2:

The data below lists the average life span (in years) of 21 different species of mammals.

5, 12, 4, 3, 12, 12, 6, 5, 8, 35, 7, 8, 12, 10, 12, 10, 3, 7, 1, 12, 10

Create a box plot of this data below.



Name	Summarize and describe distributions

6.SP.B.5a
Summarize numerical data sets in relation to their context, such as by:
Reporting the number of observations.

Question 1:

Malik recorded the number of minutes per day that he spent doing homework in the chart below.

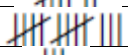
Number of minutes spent on homework								
25	40	31	48	28	31	26	30	33
40	27	43	40	33	29	41	25	26
44	35	21	36	46	30	47	39	

a.) How many days did he record the number of minutes spent on homework?

b.) How many days did he spend more than 30 minutes on homework?

Question 2:

Lea went to the grocery store and recorded the number of bags each person was carrying out.

Number of Bags	Tally
1	
2	
3	
4	
5	
More than 5	

a.) How many people did she record coming out of the store?

b.) How many people were carrying no more than 4 bags?

Name	Summarize and describe distributions

6.SP.B.5b
Summarize numerical data sets in relation to their context, such as by:
Describing the nature of the attribute under investigation, including how it was measured and its units of measurement

Question 1:

Maryam is going to conduct a survey to determine the most popular car being driven in her town. How should she conduct the survey to get the best results? Explain and justify your answer.

a.) Use the county phone book and randomly call people
b.) Go to the high school and ask each person leaving the parking lot
c.) Go to the grocery store and ask every fifth person entering the store
d.) Go to the local car dealership and ask every third customer leaving

Question 2:

A community librarian was given funds to purchase new books for the library. She randomly chose 150 people who came to the library between the hours of 10:00 A.M. and 2:00 P.M. and recorded the type of books they borrowed on that visit. The survey results showed that most people borrowed mystery novels or children's books. The librarian recommended that the library buy these types of books. Is this a valid conclusion? Why or why not? Justify your thinking.

Name	Summarize and describe distributions

6.SP.B.5c
Summarize numerical data sets in relation to their context, such as 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 were gathered.

Question 1:

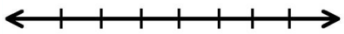
Santiago surveyed and recorded the number of TV's the family of each student in his class owned.

Number of TV's					
2	1	2	1	8	4
2	3	1	5	4	1
0	1	3	4	2	3
2	3	5	4	1	1

Determine the median and the mean of the data set. Describe any deviation from the data pattern and explain how it can impact the median and mean.

Question 2:

Using the data from Question 1, create a box plot below. Find the inter-quartile range and mean absolute deviation.(Round to the nearest hundredth.)



What percent of the family's in Santiago's class have fewer than 4 TV's in their homes?

Name	Summarize and describe distributions

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

Question 1:

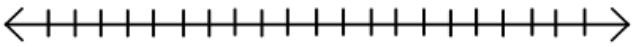
A survey was taken of a group of sixth grade students. The question they answered was how many pencils they had in their backpack at the time of the survey. The data is shown below. Use the data to create a line plot.

2, 2, 3, 4, 5, 6, 8, 8, 8, 9, 9, 9, 9, 9, 10, 10, 10, 11, 11, 12, 18

Describe the overall shape and distribution of the line plot. Identify the mean and the median. Which of the measures of center best describes the data? Explain your answer

Question 2:

Use the data set from Question 1 to create a box plot below.



Which measure of variability would be most appropriate to describe the data using the box plot? Explain your thinking.