Imagine Schools
Summer Math Challenge

Grade 4

Answer Key

When completing the problems we need to show all of our work and show all of our thinking. In this answer key, important information that was used to solve the problem is included. Compare your work to ours, especially if your answer is different than our answer.

Project #1

Domain: Operations and Algebraic Thinking (OA)
Standard:
4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Directions:

1. Read the following examples:

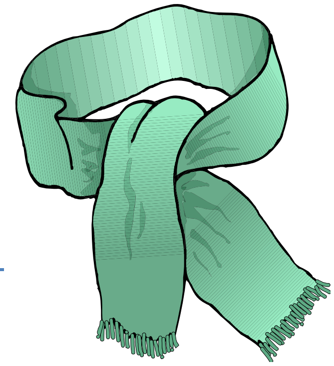
   Examples:
   3 x 11 = 33.
   Jenny is three years old. Her aunt is eleven times older. How old is Jenny's aunt?
   7 x 8 = 56
   Jerome has 7 times as many nickels as Marcus. If Marcus has 8 nickels, how many does Jerome have? Challenge: How much money does Marcus have? How much money does Jerome have?

2. Create word problems for the multiplication equations below. Show how you would solve each.

   9 x 3 = 27   6 x 10 = 60   42 = 6 x 7   44 = 11 x 4

Solution:

Solutions will vary but students should create four problems in all based on the equations provided above.



Project # 2

Domain: Operations and Algebraic Thinking

Standard:

4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

Directions:

1. Create two problems for each of the given types of problems below. Examples are provided for each.
2. Provide an answer and explanation for how you solved each of your own original problems.

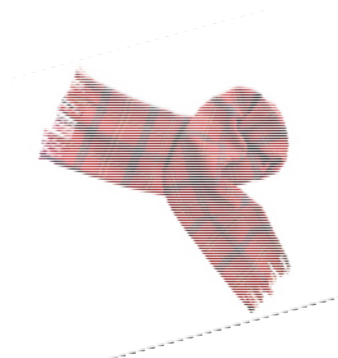
A. Unknown Product:
Example: A green scarf costs $3. A red scarf costs 6 times as much. How much does the red scarf cost? (3 x 6 = p).

B. Group Size Unknown:
Example: A book costs $18. That is 3 times more than a DVD. How much does a DVD cost? (18 ÷ p = 3 or 3 x p = 18).

C. Number of Groups Unknown:
Example: A red scarf costs $18. A blue scarf costs $6. How many times as much does the red scarf cost compared to the blue scarf? (18 ÷ 6 = p or 6 x p = 18).

Solution:

Solutions will vary depending on student-created problems. Each should follow the format of the example provided.



Project # 3

Domain: Operations and Algebraic Thinking
Standards:
4.OA.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Directions:
1. Read the description below.
2. Complete the exercise to identify prime numbers between two and one hundred.
3. Challenge: Make a list of twenty additional prime numbers above 100. Prove that they are prime and not composite numbers.

Prime Numbers

Imagine that you are part of a class of 23 students. One day the teacher asks you to divide up into equal groups. You try to divide into 2 equal groups but find you can't do it because 23 is not evenly divisible by 2. One group is always larger than the other. Then you try to split into 3 equal groups, but that doesn't work either. And neither does 4 or 5, or any of the other numbers you try. That's because 23 is a prime number.

A prime number is a number that cannot be divided evenly by any other number except itself and the number 1. A composite number, on the other hand, it a number that can be built up by multiplying smaller numbers, called factors, together. You can make the number 4 by multiplying 2 x 2. You can make the number 6 by multiplying 2 x 3. So now we know that neither of these numbers is a prime number. Is 7 a prime number?
More than 2,000 years ago, the Greek mathematician Eratosthenes came up with a clever way of determining which numbers are prime. You can use this method, too. First, make a grid of all the numbers from 2 to 100 in rows of ten, like this:

	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20, etc.

*Continued on next page.
Next, cross out all the composite numbers, leaving only the prime numbers. First circle the number 2. It is a prime number, evenly divisible only by 2 and 1. Then cross out all the multiples of 2. Each of these numbers is divisible by 2 and therefore not prime. Next, find the smallest number that has not been crossed out: 3. This number is prime, so circle it. Cross out all the multiples of 3 that have not already been crossed out. Continue by circling the smallest remaining number and crossing out its multiples.

The circled numbers are the prime numbers. If you did everything right, there should be 25 prime numbers circled.

Use the space below to complete the exercise above:

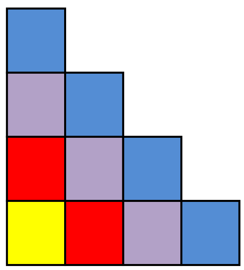
Use the space below to complete the challenge (#3) from the directions above:

Project #4

Domain: Operations and Algebraic Thinking
Standards:
4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

Directions:
1. Read the example below and use pictures or models to answer the question.

   Stepping Up
   Study this picture. How many blocks would you need for a 20-step staircase?



2. Challenge: Set up a rule for a number or shape pattern equation for a parent to solve. You can create a chart or function machine (showing what goes in or comes out) or use another method of your choice.
   Study the chart below for some examples:

Pattern	Rule	Feature
3, 8, 13, 18, 23, 28, …	Start with 3, add 5	The numbers alternately end with a 3 or 8
5, 10, 15, 20 …	Start with 5, add 5	The numbers are multiples of 5 and end with either 0 or 5. The numbers that end with 5 are products of 5 and an odd number. The numbers that end in 0 are products of 5 and an even number.

Solution:
1. You would need 210 blocks for a 20 step staircase.

Answers will vary. Students should include the rule, pattern and feature for their function.

Project #5

Domain: Operations and Algebraic Thinking
Standard:
4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

Directions:

1. Read the following,

   Consecutive Numbers

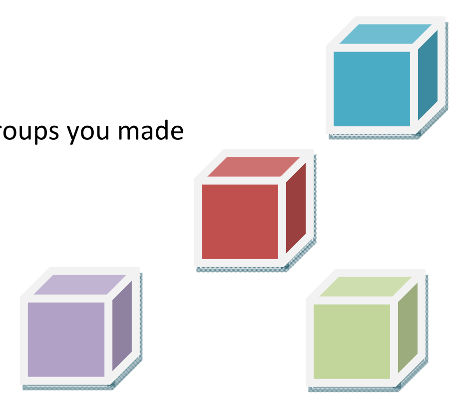
   An example of consecutive odd numbers is 23, 25, 27, and 29.

2. Now solve this problem:

   Find four consecutive odd numbers with a sum of 160. Show your work.

3. Create your own challenge problem for a friend or parent to solve involving consecutive numbers.

4. Use cubes to complete the following:
   Build 5 groups of 3 to represent 15 or
   Build 5 groups of 3 two times to represent 2 x (5 x 3)
   Then count 10 groups of 3 (10 x 3) or 30 cubes total.
   Create a drawing to show your work for each of the above groups you made when building with cubes.



Solution:

2. $n + (n + 2) + (n + 4) (n + 6) = 160$

   $n = 37$

Project #6

Domain: Number and Operations in Base Ten
Standards:
4.NBT.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Directions:

1. Arrange these numbers in order, beginning with the smallest.

   2400 4002 2040 420 2004

2. Arrange these numbers in order, beginning with the greatest.

   1470 847 710 1047 147

3. Using a newspaper or magazine, find eight 3 or 4-digit numbers and cut them out. Arrange them in order on a piece of paper or in your math journal/notebook. Keep this to turn in with your math summer challenge packet.

Solutions:

1. 2400 4002 2040 420 2004

   We know that 420 is less than any four-digit number. Of the numbers 2004, 2040, and 2400, 2004 is the least, and 2400 is the greatest, since four ones are less than four tens, and four tens are less than four hundreds. 4002 is the greatest number since it contains four thousands, and the other three four-digit numbers contain less than three thousands.

2. 1470 847 710 1047 147

   We know that 1470 and 1047 are greater than the three three-digit numbers, since 1470 and 1047 are both greater than one thousand, and the three-digit numbers are less than one thousand. 1470 is greater than 1047 because 1470 contains one thousand and four hundreds, while 1047 contains one thousand and less than one hundred. We know that 847 is greater than 710 because 847 contains eight hundreds, and 710 contains less than eight hundreds. 710 is greater than 147 because 710 contains seven hundreds, and 147 contains less than two hundreds.

3. Students should have cut and pasted at least 8 numbers from a newspaper or magazine in order from least to greatest. Numbers and order will vary.

Project #7

Domain: Number and Operations in Base Ten

Standards:

4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Directions:

1. Read the following definitions to remind you of concepts you should have learned during your 4th grade math class.

Associative Property

The property which states that for all real numbers *a*, *b*, and *c*,
their product is always the same, regardless of their grouping:

$(a \cdot b) \cdot c = a \cdot (b \cdot c)$

Example:

$(5 \cdot 6) \cdot 7 = 5 \cdot (6 \cdot 7)$

Distributive Property

The property which states that multiplying a sum by a number gives the same result
as multiplying each addend by the number and then adding the products

$a(b + c) = a \text{ X } b + a \text{ X } c$

Examples:

$3(4 + 5) = 3 \text{ X } 4 + 3 \text{ X } 5$

$3(a + b) = 3a + 3b$

2. Then solve the following three problems and state which property you used to do so. Show all of your work.

    1. 25 x 28=
    2. 102
x 14
    3. 425 divided by 12

3. Finally, create one real world problem to show you understand the associative property and one word problem to show you understand the distributive property.

    Two examples for the associative property:

    - Partial products method—14 x 16 = 100 (multiply 10 x 10) + 40 (multiply 10 x 4) + multiply 6 x 10 + (multiply 6 x 4)
    - Multiple addition method—14 x 16 = 16 + 16 + 16 + 16 + 16 + 16 + 16 + 16 + 16 + 16 + 16 + 16 +16 + 16 + 16 + 16

    Two examples for the distributive property:

    - Share 25 books among 4 girls. (6 with a remainder of 1)
    - Share 25 bananas among 4 girls (6 ¼).

Project #8

Domain: Number and Operations in Base Ten
Standards:
4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.

Directions:

1. Use place value understanding to round numbers to solve the following problem. Show all of your work. Draw a picture and write an explanation to show how you solved the problem.

   Your class is collecting bottled water for a service project. The goal is to collect 300 bottles of water. On the first day, Max brings in 3 packs with 6 bottles in each container. Sarah wheels in 6 packs with 6 bottles in each container. About how many bottles of water still need to be collected?

2. Round the following numbers to the nearest tens and hundreds.

Number	Tens	Hundreds
876		
931		
2,365		
808		
4,099		
222		
351		
3,003		

3. Create a word problem of your own in which rounding can be used to find a reasonable solution and/or to verify your solution.

Solutions:

1. About 240 more bottles.
2.

Number	Tens	Hundreds
876	880	900
931	930	900
2,365	2,370	2,400
808	810	800
4,099	4,100	4,100
222	220	200
351	350	400
3,003	3,000	3,000

3. Problems and solutions will vary.

Project # 9

Domain: Number and Operations—Fractions

Standards:

4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Directions:

1. Read the following problem.

   There are two cakes on the counter that are the same size. The first cake has 1/2 of it left. The second cake has 5/12 left. Which cake has more left?

2. Create a model to show the comparison using a number line.
3. Draw a picture to represent the problem.

4. Use symbols to compare the following fractions:

   1/4 __ 2/3   2/8 __ 1/4   1/2 __ 3/7

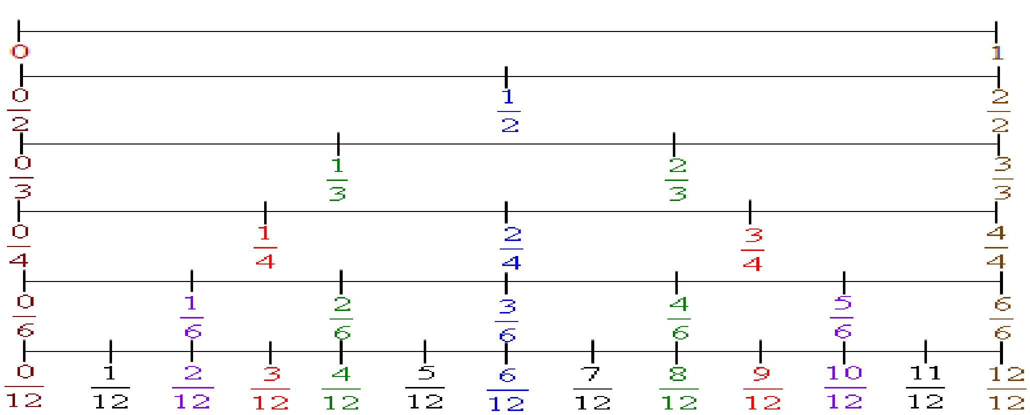
   4/8 __ 5/6   2/3 __ 4/5   7/8 __ 3/4

5. Create models to show the comparisons using a number line to verify your solutions.

Solutions:

1/4 < 2/3   2/8 = 1/4   1/2 < 3/7

4/8 < 5/6   2/3 < 4/5   7/8 > 3/4



Project #10

Domain: Number and Operations—Fractions

Standards:

4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Directions:

1. Solve the following problem below using pictures, computations, or other strategies you have learned. Make sure to show all of your work in the space provided or on an additional piece of paper.
2. Then create your own story problem using parts of a whole (fractions).
3. Include a solution, picture and solution to your problem.

Problem:

Bill, Sally, Peter and Jen all went to Hershey Park, Pennsylvania. While on a tour at the Hershey's Factory, they got to reach into a bag and pull out a part of a bar of chocolate. When they left the factory, their teacher said they could eat their chocolate bars once they found out who had the largest piece of chocolate Use the information below to solve the problem so Bill, Sally, Peter and Jen can enjoy their chocolate. *Make sure to follow the directions above.

Bill has 1/3 of a bar, Sally has 4/6 of a bar, Peter has 9/12 of a bar, Jen has 13/18 of a bar. Show how you know the answer.

Solution:

Students should show that they need to find a common denominator. Once they do, they can compare fractions to determine who has the largest piece.

Bill: $\frac{12}{36}$

Sally: $\frac{24}{36}$

Peter: $\frac{27}{36}$

Jen: $\frac{26}{36}$

Peter has the largest piece of candy bar.

Next, create your own similar problem to demonstrate your understanding of fractions and sharing parts of a whole. Write your problem below and include a detailed solution to follow.

Student problems will vary.

Project #11

Domain: Number and Operations—Fractions
Standards:
4.NF.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

Directions: Solve the following problems. Show how you reached your solution.

1. Mary and Lacey decide to share a pizza. Mary ate 3/6 and Lacey ate 2/6 of the pizza. How much of the pizza did the girls eat together?

2. What part of the M&M'S are not orange?

Pack of M&M's

Color	Number of M&Ms
Red	3
Orange	12
Green	5
Yellow	9
Blue	6
Brown	12
Light brown	2

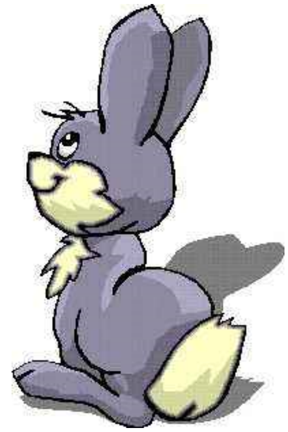
Answer: _____ out of __________ are not orange.

3. Challenge:
   - Get a snack size or King Size bag of M&Ms. Complete your own investigation to see what part of the M&Ms are not orange.
   - Create a chart to record the color of M&Ms and the number of each.
   - Compare your results with the ones above and write any observations you come to below.

Possible solutions:
1. The amount of pizza Mary ate can be thought of a 3/6 or 1/6 and 1/6 and 1/6. The amount of pizza Lacey ate can be thought of a 1/6 and 1/6. The total amount of pizza they ate is 1/6 + 1/6 + 1/6 + 1/6 + 1/6 or 5/6 of the whole pizza.

*Students should justify their breaking apart (decomposing) of fractions using visual fraction models. The concept of turning mixed numbers into improper fractions needs to be emphasized using visual fraction models.

Project #12



Domain: Number and Operations—Fractions
Standards:
4.NF.6 Use decimal notation for fractions with denominators 10 or 100.

Directions:
1. Design a chart to display the equivalent relationships of fractions and decimals.
2. Then create a number line with a piece of string and use index cards to write these numbers on, and place these numbers and other numbers on your number line (string).
3. Be sure to include the following fractions and decimals:

$\frac{3}{10}$ $\frac{85}{100}$ $\frac{70}{100}$ $\frac{34}{100}$ $\frac{6}{10}$ $\frac{49}{100}$

.40 .06 .50 .83 .75 .009

4. Include at least three fractions and their equivalent decimals of your choice.

Equivalent Fractions

Fraction	Decimal
3/10	.3
85/100	.85
70/100	.70
34/100	.34
6/10	.6
49/100	.49
40/100	.40
6/100	.06
50/100	.50
83/100	.83
75/100	.75
9/1000	.009

Project #13

Domain: Number and Operations—Fractions

Standards:

4.NF.4 Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

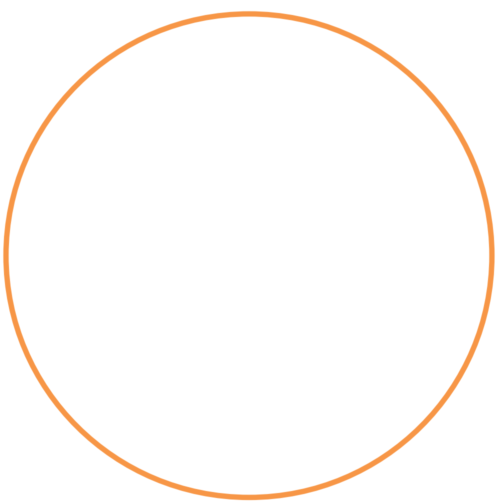
4NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100

Directions:

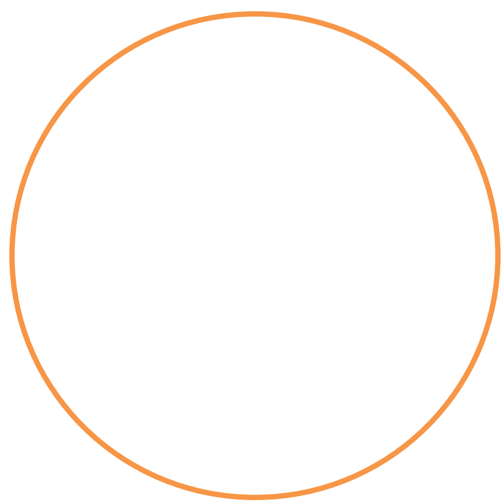
Complete the following problems. Then create three problems of your own involving fractions.

1. Masha had 120 stamps. She gave her sister half of the stamps and three more. How many stamps does Masha have left?

2. Create a circle model divided into 10 equal sections. Create a second circle model divided into 100 equal sections. Represent 3 tenths and 30 hundredths on the circle models below.



3 tenths

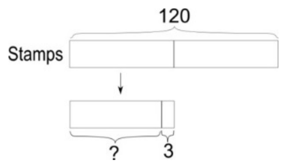


3 hundredths

Solution:

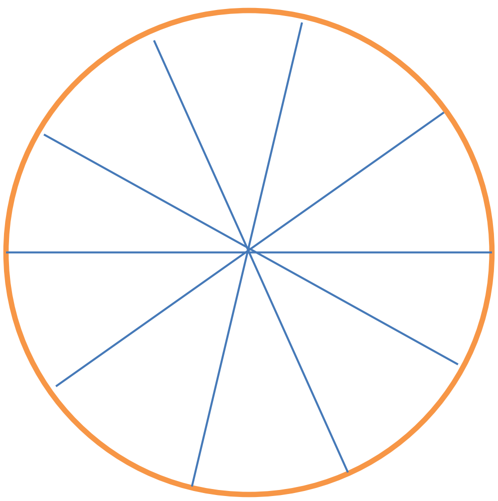
1. Half of 120 is 1/2 ×120=60.

Masha gave half of the stamps and three more to her sister, so she gave 60+3=63 stamps to her sister.
She had 120 stamps and gave away 63, so she has 120−63=57 stamps left.
We can visualize this better and streamline the argument a little with a bar diagram:

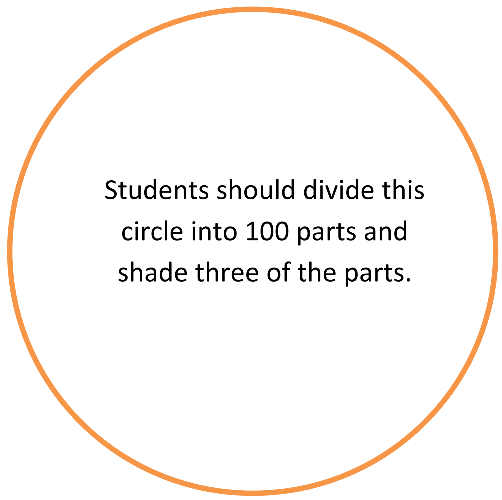


2 units = 120
1 unit = 60
60 - 3 = 57
Masha had 57 stamps left.

2. Create a circle model divided into 10 equal sections. Create a second circle model divided into 100 equal sections. Represent 3 tenths and 30 hundredths on the circle models below.



3 tenths



3 hundredths

Project #14

Domain: Measurement and Data

Standards:

4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Directions:

1. Read the background information about cubits used in building pyramids.

   Cubit Craze!

   The ancient Egyptians used a measurement called a cubit to build the pyramids. A cubit was the distance from the bent elbow to the end of the middle finger.

   Using your own self as a measurement, find out how many inches in a cubit.

2. Use the internet (with supervision), math text book, or reference book for help to find out how to convert cubits to inches. Then, use the information you found to solve the second part of the problem below.

   If a pyramid is 100 cubits long, about how many inches is that?
   How many feet?

Project # 15

Domain: Measurement and Data
Standards:
4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

Directions:
1. Read the problem below.

2. Read it again and draw a picture paying attention to details as you go.

   The third grade students at Westview Elementary School built a nature trail behind their school. The trail started and ended at the same place. It had five sides. Two were 60 feet long and the remaining three were 30 feet long.

3. Draw a picture to scale using inches instead of feet (1 inch = 1 foot).
   *Be sure to include a key that shows the scale you used.

3. Next, answer the following questions.

   What is the name of the shape of the nature trail? _________
   How long is the nature trail (in feet)? _______
   How long is the nature trail (in yards)? ______

4. Find the area of the ground covered inside the nature trail. Use the space below and show all of your work.

Project #16

Domain: Measurement and Data

Standards:

4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Directions:

1. Solve the following:

> Charlie and 10 friends are planning for a pizza party. They purchased 3 quarts of milk. If each glass holds 8oz will everyone get at least one glass of milk?

2. Create a conversion chart to use as a tool to solve.
3. Show how you arrived at your answer.

Possible solution:

Charlie plus 10 friends = 11 total people
11 people x 8 ounces (glass of milk) = 88 total ounces
1 quart = 2 pints = 4 cups = 32 ounces

Therefore 1 quart = 2 pints = 4 cups = 32 ounces
2 quarts = 4 pints = 8 cups = 64 ounces
3 quarts = 6 pints = 12 cups = 96 ounces

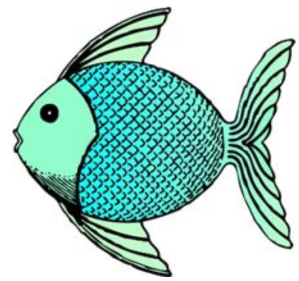
If Charlie purchased 3 quarts (6 pints) of milk there would be enough for everyone at his party to have at least one glass of milk. If each person drank 1 glass then he would have 1- 8 oz glass or 1 cup of milk left over.

Project # 17

Domain: Measurement and Data

Standards:

4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*



Directions:

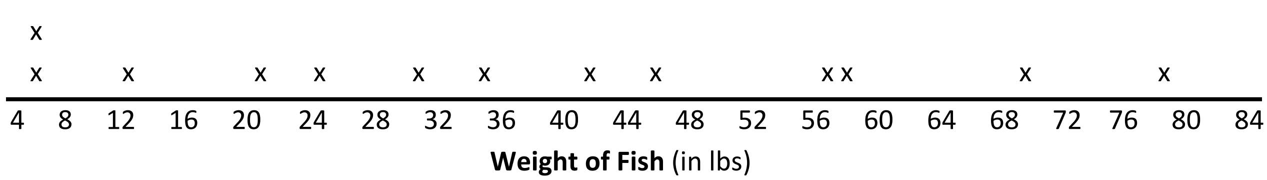
Use the table to complete Exercises 1-6.

Record Weights for Freshwater Fish

Fish	Weights
Bass, largemouth	22 lb 4 oz
Bluegill	4 lb 12 oz
Carp	57 lb 13 oz
Catfish, blue	77 lb
Catfish, channel	58 lb
Muskellunge	69 lb 15 oz
Perch, white	4 lb 12 oz
Pike, northern	46 lb 2 oz
Salmon, Atlantic	79 lb 2 oz
Salmon, coho	31 lb
Salmon, pink	12 lb 9 oz
Trout, brown	35 lb 15 oz
Trout, rainbow	42 lb 2 oz
Walleye	25 lb

1. Make a line plot of the data.
2. Identify any points that seem to stand out.
3. What fish was the largest?
4. What fish was the smallest?
5. Are the weights of any fish clustered? If so, which ones?
6. Find similar data on a subject of interest to you and make a line plot.

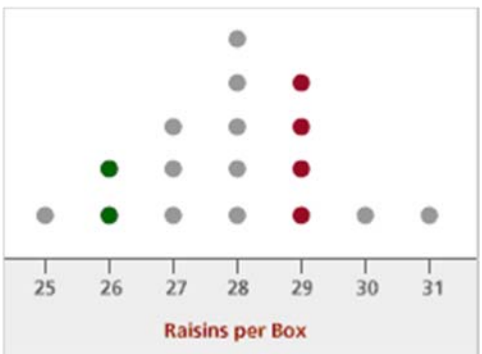
Solution:



Project #18

Domain: Measurement and Data
Standards:
4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

Here is the line plot for the 17 raisin counts of Brand X raisins:



1. Use the line plot to answer the following questions:

   a. What is the minimum (smallest) raisin count for a box of Brand X raisins?
   b. What is the maximum (largest) raisin count for a box?
   c. How many boxes have between 26 and 28 raisins, inclusively (i.e., including 26 and 28)?
   d. How many boxes have between 25 and 31 raisins, inclusively (i.e., including 25 and 31)?
   e. Which raisin count occurred most frequently?
   f. How many boxes contain more than 29 raisins?
   g. How many boxes contain 29 or fewer raisins?
   h. How many boxes contain fewer than 26 raisins?
   i. How many boxes contain 25 or fewer raisins?
   j. How many boxes contain between 26 and 29 raisins, inclusively?

2. Look back at the answers you gave in Problems (f) and (g). Are these answers related? If so, how? And why? What about your answers to Problems (h) and (i)?

3. Based on your observations above, give three descriptive statements that provide an answer to the question "How many raisins are there in a half-ounce box of Brand X raisins?" At least two of your statements should take into account the variation in the data.

Solutions:

1.

What is the minimum (smallest) raisin count for a box of Brand X raisins? 25

What is the maximum (largest) raisin count for a box? 31

How many boxes have between 26 and 28 raisins, inclusively (i.e., including 26 and 28)? 10

How many boxes have between 25 and 31 raisins, inclusively (i.e., including 25 and 31)? 17

Which raisin count occurred most frequently? 28

How many boxes contain more than 29 raisins? 2

How many boxes contain 29 or fewer raisins? 15

How many boxes contain fewer than 26 raisins? 1

How many boxes contain 25 or fewer raisins? 1

How many boxes contain between 26 and 29 raisins, inclusively? 14

2. For Problems (f) and (g), if you already know how many boxes contain more than 29 raisins, all other boxes must contain 29 or fewer raisins. Instead of counting a large number of boxes for Problems (g), you could subtract the answer to Problem (f), which is 2, from the total number of boxes, 17, to get your answer, 15.

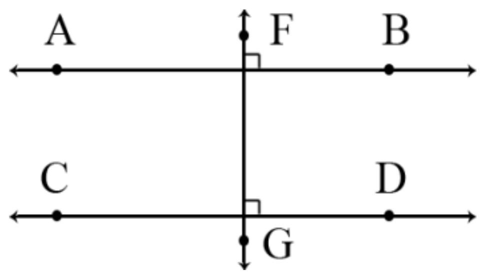
   As for Problems ~~B6~~ (h) and (i), they are identical questions because the data is discrete. There is no way to have between 25 and 26 raisins, so asking how many boxes have fewer than 26 raisins is the same as asking how many have 25 or fewer.

3. **a.**The box of raisins should have between 25 and 31 raisins.
b. The box of raisins is very likely to have between 26 and 29 raisins.
c. The box of raisins is unlikely to have 28 raisins, but this is the most likely number from our sample.

Project #19

Domain: Geometry
Standards:
4.G.1

Directions: Answer the questions below using the line segment picture.



1) Which line segment is longer AB or FG? How do you know?

2) Which lines in the figure are parallel?

3) Using a ruler, draw the parallel and intersecting lines that you see in the above diagram.

4) Create a line segment parallel to FG? Name the line segment.

5) Which line segment(s) intersect AB?

6) What is the measure of the angle formed by the intersection of these lines?

7) What is the name we use to describe lines CD and FG? _______________lines.

Project #20

Domain: Geometry

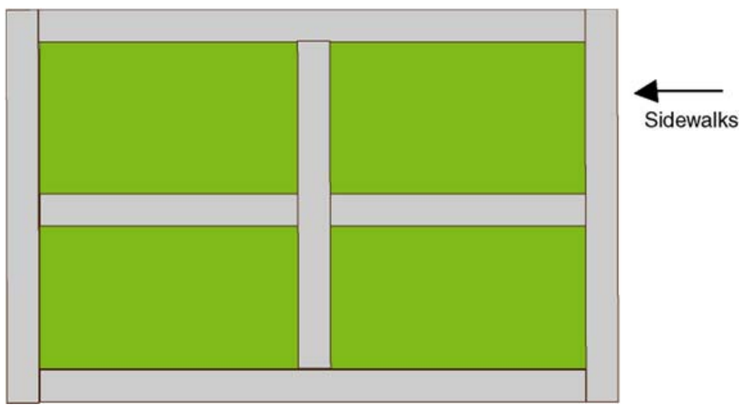
Standards:

4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Directions:

Study the sketch below, then read the story problem and use your knowledge of measurement to solve.

Surface Area



Here is a sketch of a city park. It is 400 ' long and 300 ' wide.
The sidewalks are 6 ' wide. What is the surface area of the sidewalk?

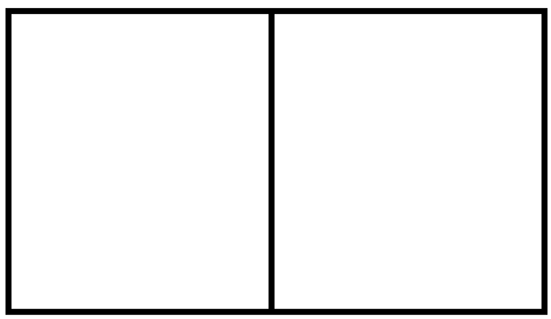
Extensions

The following projects are based on standards you will learn in fifth grade.
They should be challenging for you at this point. Try them out and save your work along the way.

Project #21

Domain: Measurement and Data

Part I:



Directions: Solve this problem using the figure above.

If the short side of the first rectangle above is 3 units and the longest side is 4 units, then what is the area of each of the two rectangles when the rectangle is divided in half?

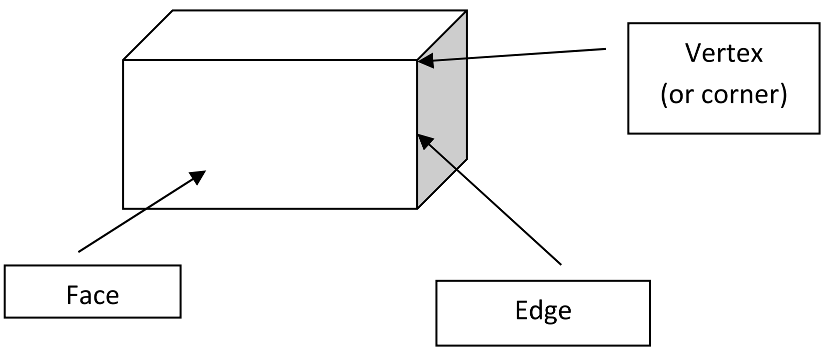
Hint: The area of a rectangle can be found by multiplying the base times the height.

Project #22

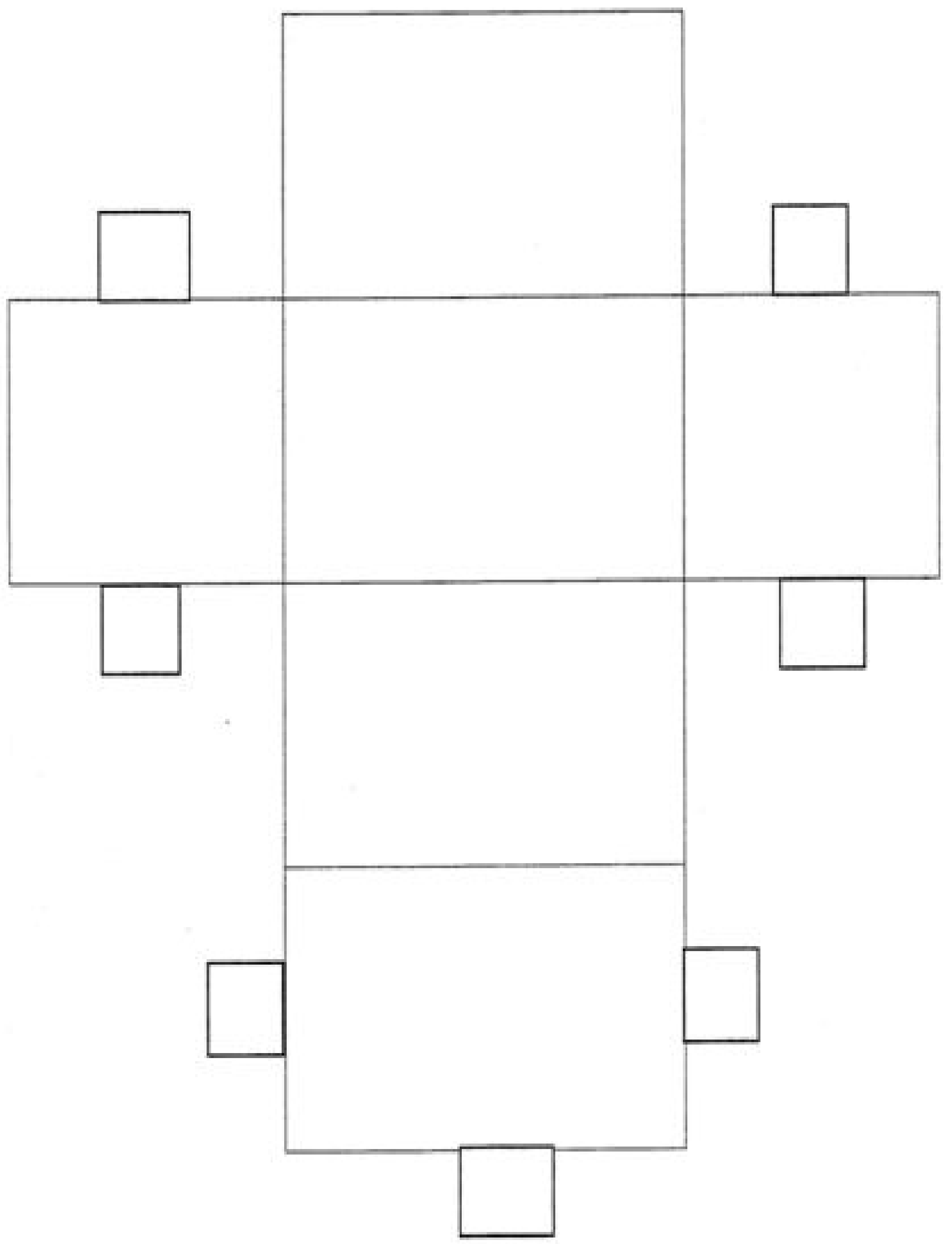
Domain: Geometry

Directions: Cut out the shapes on pages 13-15 and fold and tape the shapes to create a 3 dimensional figure. Then fill in the chart below with the information about the figures.

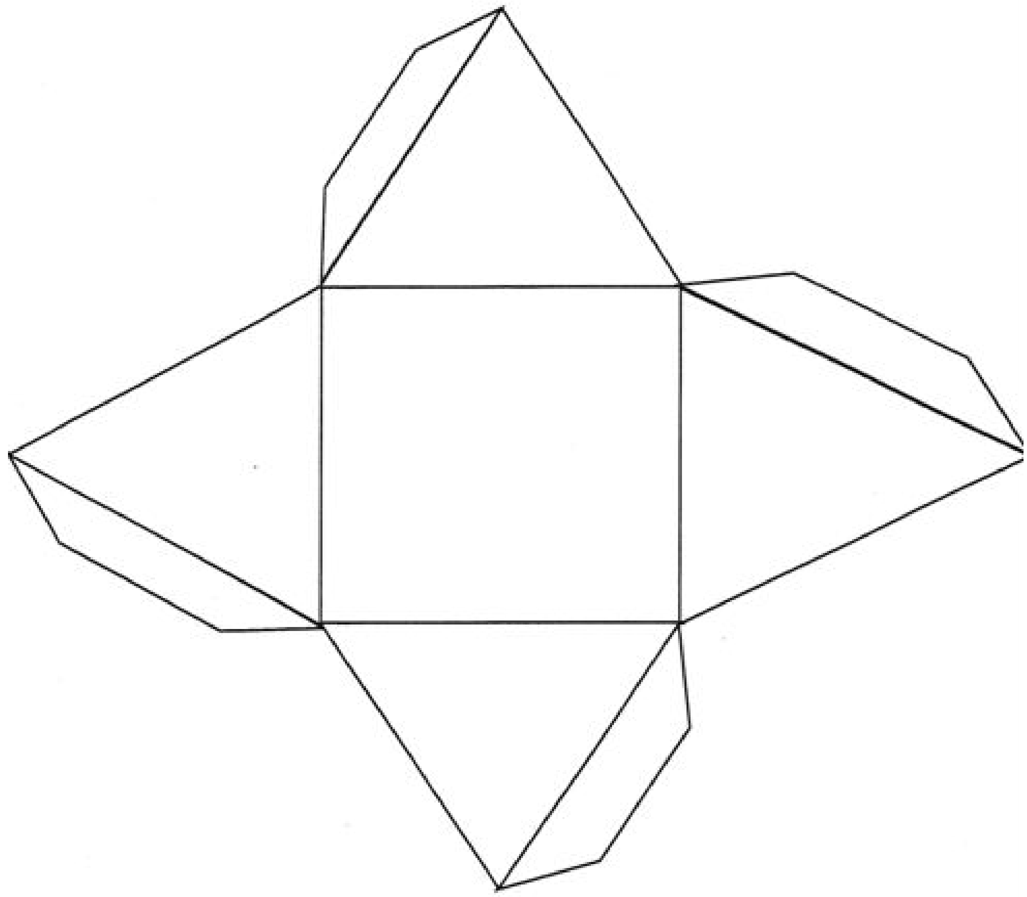
Shape	Number of Faces	Number of Edges	Number of Vertices
Rectangular Prism			
Pyramid			
Triangular Prism			



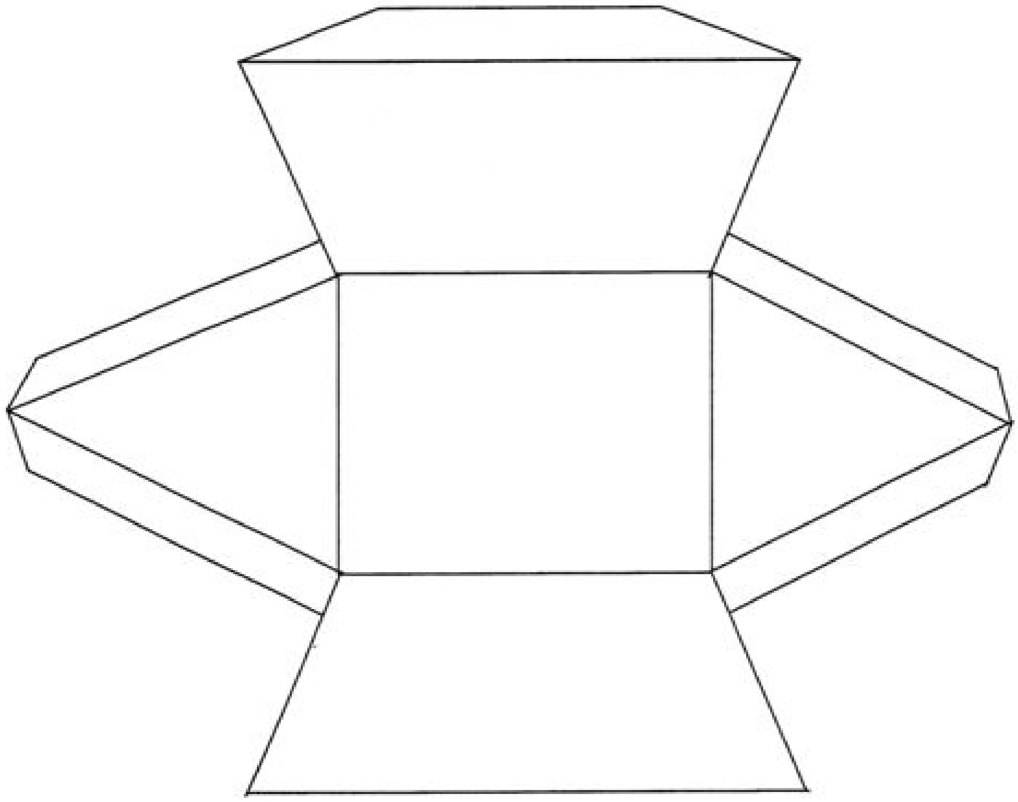
Rectangular Prism



Pyramid

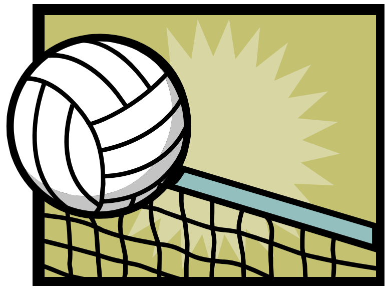


Triangular Prism



Project #23

Strand: Measurement and Data



Directions:

1. Read the problem below.
2. Use the space below and the outline that has been started to create a graphic representation of the data. *Be sure to include a key!

Mr. Gordon has opened a ball shop.

Make a pictograph that shows four volleyballs, six soccer balls, four more basketballs than soccer balls, and five more baseballs than volleyballs. Make each picture equal two.

Basketballs **Baseballs** **Volleyballs** **Soccer balls**

Project #24

Domain: Number and Base Ten

Directions:

1. Read the problem below.
2. Ask a parent or guardian if you can borrow the family calendar or find a blank calendar on the internet to use for this problem.

   In November Katlin will play basketball every third day, beginning on November 3rd. She is also scheduled to play soccer every fourth day, beginning on November 4th.

3. Using a pencil or pen (with your parent/guardian's permission of course) mark the days described in the story above on the calendar using a different symbol for basketball and soccer.

4. Using the information you gained, solve the problem below.

   On what days will Katlin be playing both basketball and soccer?________________________

Project #25

Domain: Measurement and Data

Directions:

1. Read the problem below.
2. Read it a second time through to make sure you understand what you are being asked to do.

Regina has received a pet rabbit from her neighbor Rodney who is about to move to an apartment that does not allow pets. Her father is going to help her build a run for the rabbit in their back yard, but he wants Regina to design it.

Regina sits down to think about the possibilities. Her father says that the run must be rectangular with whole number dimensions. If they want to enclose 48 square feet, how many options do they have?

3. Using a ruler and pencil on graph paper (if available) to draw out all of the possibilities that might work for the rabbit run.

*Hint: Use your knowledge of multiplication and factors to help you solve this problem.