

Student Name: _____ Homeroom: _____

6th Grade Math

Distance Learning Packet

Week 2

Directions:

Daily Directions

Read directions for the topic and work through the examples.

problems for each section. You can separate the sheets from the packet. For sections with enough space on the page, there is no extra workspace at the back of the packet.

Students should complete approximately 20-30 problems (approximately 20-30 problems)

Contact Information:

Teacher Contact Information

School Contact Information



Chapter 1

Fractions

Standards Covered: 6.NS.A.1, 6.NS.B.4, 6.EE.A.2, LEAP.II.6.2, LEAP.II.6.3, LEAP.III.6.1, LEAP.III.6.2, LEAP.III.6.3

1.1 Factors (DOK 1, 2)

Two numbers multiplied together create a **product**. The two numbers that were multiplied together are called **factors** of the product.

$$\text{factor 1} \times \text{factor 2} = \text{product}$$

Factors will evenly divide into their products.

$$\text{product} \div \text{factor 1} = \text{factor 2} \quad \text{or} \quad \text{product} \div \text{factor 2} = \text{factor 1}$$

For example, 20 can be evenly divided by 4, so 4 is a factor of 20. Because $4 \times 5 = 20$, 5 is also a factor of 20. The complete list of factors of 20 are $\{1, 2, 4, 5, 10, 20\}$.

The following Rules of Divisibility are clues to help identify factors.

Rules of Divisibility

1. All even numbers are divisible by 2.
2. All numbers whose digits when added together equal a number divisible by 3, are divisible by 3. Example: 39 is divisible by 3
 $3 + 9 = 12$. 12 is divisible by 3 (4 times); so 39 is also divisible by 3.
3. All numbers ending in 5 or 0 are divisible by 5.
4. All numbers divisible by 2 and 3 are divisible by 6.
5. All numbers whose digits when added together equal a number divisible by 9, are divisible by 9. Example: 117 is divisible by 9 $\rightarrow 1 + 1 + 7 = 9$. 9 is divisible by 9 (1 time); so 117 is also divisible by 9.
6. All numbers ending in 0 are divisible by 10.

Common factors are those factors 2 or more numbers share or have in common.

Example 1: The factors of 10 are $\{1, 2, 5, 10\}$.
The factors of 12 are $\{1, 2, 3, 4, 6, 12\}$.
The common factors of 10 and 12 are $\{1, 2\}$.

List all the factors of each number. (DOK 1)

1. 32 2. 48 3. 27 4. 45 5. 12 6. 36

List the factors of each number. Circle the common factors of each pair. (DOK 1)

7. 16, 20 8. 45, 25 9. 9, 20 10. 18, 30 11. 36, 54 12. 18, 21

The **distributive property** is expressed as $a(b + c) = ab + ac$. Note that a is multiplied by both b and c on both sides of the distributive property. Another way to discuss the distributive property is that a is the common factor for the two numbers ab and ac .

Example 2: Rewrite the problem $12 + 18$ to illustrate the distributive property.

Step 1: Find the common factor of both numbers:

The factors of 12 are $\{1, 2, 3, 4, 6, 12\}$.

The factors of 18 are $\{1, 2, 3, 6, 9, 18\}$.

A common factor for 12 and 18 is 6.

Step 2: Using the common factor, 6, as one factor, find the other factor for the numbers 12 and 18 by using division.

$$12 \div 6 = 2 \text{ and } 18 \div 6 = 3$$

Step 3: Display the factors to illustrate the distributive property.

$$6(2 + 3) = (6 \times 2) + (6 \times 3)$$

Answer: $6(2 + 3) = (6 \times 2) + (6 \times 3)$

Use the problems below to illustrate the distributive property. Some of the pairs of numbers may have more than one common factor. (DOK 2)

13. $9 + 15$ 15. $25 + 35$ 17. $36 + 54$ 19. $16 + 8$
14. $20 + 6$ 16. $12 + 20$ 18. $14 + 21$ 20. $30 + 100$

1.2 Greatest Common Factor (DOK 1)

The **Greatest Common Factor** or GCF of two numbers is the greatest or largest of the factors the two numbers have in common.

Example: The factors of 10 are $\{1, 2, 5, 10\}$.

The factors of 12 are $\{1, 2, 3, 4, 6, 12\}$.

The common factors of 10 and 12 are $\{1, 2\}$.

The GCF of 10 and 12 is 2.

List all the factors of each number in the table below. (DOK 1)

Number	Factors
8	
20	
16	
40	
12	
32	

Answer the following questions. (DOK 1)

1. What is the GCF of 16 and 20?
2. What is the GCF of 32 and 40?
3. What is the GCF of 6 and 8?
4. What is the GCF of 9 and 12?
5. What is the GCF of 10 and 25?
6. What is the GCF of 20 and 8?
7. What is the GCF of 18 and 27?
8. What is the GCF of 40 and 70?
9. What is the GCF of 14 and 35?
10. What is the GCF of 8, 16, and 32?
11. Explain how you can be sure you have found the **greatest** common factor between two numbers and not just any common factor.



Chapter 6

Ratios, Unit Rates and Percents

Standard(s) covered: 6.RP.1A., 6.RP.A.2, 6.RP.A.3, LEAP.II.6.8

6.1 Ratios (DOK 2)

Ratios are used to compare parts to a whole.

Example 1: The recipe for jam requires 8 cups of sugar for every 6 cups of strawberries. What is the ratio of strawberries to sugar in this recipe?

First number requested	<u>cups strawberries</u>	$\frac{6}{8}$
Second number requested	cups sugar	

Answers may be simplified to lowest terms. $\frac{6}{8} = \frac{3}{4}$

Ratios are used to compare amounts. They can also be written using a colon (:)

Example 2: 5:7 - This ratio would be read “five to seven”.
Ratios do not always explain the actual amount but rather a relationship or comparison. Ratios are written based on the order of the amounts that are requested in the question. Read the following recipe:

Simple Cake Recipe

- 1 cup milk
- 2 cups sugar
- 3 cups flour
- 4 eggs, beaten

Mix thoroughly; bake at 350°F until done.

Use the recipe above to write the ratios for each comparison. Express your answer in fraction form, and simplify to lowest terms. (DOK 2)

- | | | | |
|-------------------|------------------|------------------|------------------|
| 1. milk to sugar | 3. flour to eggs | 5. eggs to sugar | 7. milk to flour |
| 2. sugar to flour | 4. milk to eggs | 6. eggs to milk | 8. sugar to milk |

6.2 Ratio Problems (DOK 2)

In some word problems, you may be asked to express answers as a **ratio**. Ratios can look like fractions. Numbers must be written in the order they are requested. In the following problem, 8 cups of sugar is mentioned before 6 cups of strawberries. But in the question part of the problem, you are asked for the ratio of STRAWBERRIES to SUGAR. The amount of strawberries is the first word mentioned in the ratio, so it must be the **top** number of the fraction. The amount of sugar, the second word mentioned, must be the **bottom** number of the fraction.

Example: The recipe for jam requires 3 cups of sugar for every 6 cups of strawberries. What is the ratio of strawberries to sugar in this recipe?

First number requested	$\frac{\text{cups strawberries}}{\text{cups sugar}}$	$\frac{6}{3}$
Second number requested		

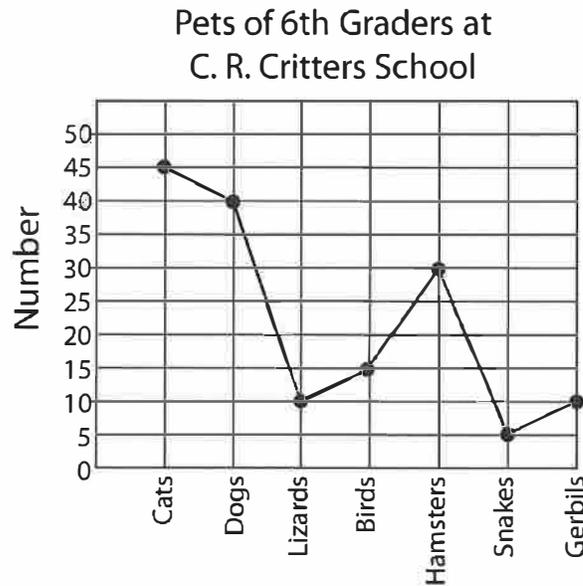
Answers may be simplified to lowest terms. $\frac{6}{3} = \frac{2}{1}$

Practice writing ratios for the following word problems, and simplify to lowest terms. DO NOT CHANGE ANSWERS TO MIXED NUMBERS. Ratios should be left in fraction form. (DOK 2)

1. Out of the 301 seniors, 117 are boys. What is the ratio of boys to the total number of seniors?
2. It takes 11 cups of flour to make 3 loaves of bread. What is the ratio of cups of flour to loaves of bread?
3. A skyscraper that stands 530 feet tall casts a shadow that is 84 feet long. What is the ratio of the shadow to the height of the skyscraper?
4. The newborn weighs 7 pounds and is 21 inches long. What is the ratio of weight to length?
5. Jack paid \$4.00 for 6 pounds of apples. What is the ratio of the price of apples to the pounds of apples?
6. When Grandma makes strawberry jam, she uses a ratio of 3 cups of sugar to 4 cups of strawberries.
Which statements are true?
 - A. The total volume of jam is always 7 cups.
 - B. The total volume of jam is always a multiple of 7.
 - C. The jam always has 4 more cups of sugar than strawberries.
 - D. For every cup of sugar Grandma uses $\frac{3}{4}$ cup of strawberries.
 - E. For every cup of sugar Grandma uses $\frac{4}{3}$ cups of strawberries.

6.3 Using Graphs to Solve Ratio Problems (DOK 2)

Instructions: Carefully look at the following graphs, and solve the ratio problems that follow. Write your answers as a fraction. Simplify the fraction if possible. (DOK 2)



1. What is the ratio of lizards to dogs?
2. What is the ratio of gerbils to birds?
3. What is the ratio of cats to hamsters?
4. What is the ratio of birds to dogs?

	Type of Sport		
	Football	Basketball	Soccer
Boys	14	22	16
Girls	1	15	12

5. What is the ratio of boy soccer players to girl soccer players?
6. What is the ratio of girl basketball players to girl soccer players?
7. What is the ratio of boy football players to girl basketball players?
8. What is the ratio of girl soccer players to girl football players?

6.4 Equivalent Ratios (DOK 1, 2)

Ratios show how two amounts are related. If the ratio of boys to girls in a school is 1:3, this can be written as $\frac{10}{30}$, 2:6, or $\frac{20}{60}$. Each one of these represents an equivalent ratio to 1:3.

To find equivalent ratios, write the ratio as a fraction. Then, multiply or divide the top and bottom by the same number. To express the ratio in simplest form, you must divide each number in the ratio by their Greatest Common Factor (GCF).

Example: $\frac{2}{5} = \frac{4}{\square}$

Multiply 2 by 2 to find a product of 4.

Multiply 5 by the same factor (Multiply 5 by 2).

10 is the missing number.

Use what you know about ratios to solve the following. (DOK 2)

- Write the ratio $\frac{15}{25}$ in simplest form.
- Write the ratio 4:8 in simplest form.
- Write the ratio $\frac{8}{64}$ in simplest form.
- Write the ratio 14 : 21 in simplest form.

Replace the x , y , and z in the tables of equivalent ratios with the correct number. Do not simplify the answers. (DOK 2)

5.

2 : 3
40 : x
$\frac{y}{6}$
$\frac{12}{z}$

6.

1 : 5
30 : x
$\frac{y}{25}$
$\frac{6}{z}$

7.

3 : 4
21 : x
$\frac{y}{40}$
$\frac{18}{z}$

8.

2 : 7
22 : x
$\frac{y}{28}$
$\frac{4}{z}$

9.

3 : 8
9 : x
$\frac{y}{88}$
$\frac{18}{z}$

- Mrs. Iachetta's recipe for salad dressing uses a ratio of 1 part olive oil to 2 parts vinegar. If she uses 3 cups olive oil, how much vinegar will she need?
- Marc's grades are as follows: Reading, 88; Math, 92; Science, 96; Social Studies, 90; and Language Arts, 94. Which classes are compared by the ratio 94:90? (Write them as a ratio.)
- A map shows a scale of 1 inch = 50 miles. How many miles are represented by 4.5 inches on the map?

6.5 More Ratios (DOK 2)

Movie Attendance	
Adventure	24
Suspense	18
Comedy	16
Romance	14
Animation	9
Science Fiction	8
Fairy Tale	7

Example: For every _____ people who saw an adventure movie, _____ saw a science fiction movie.

Step 1: Make a fraction using the numbers in the chart:

$$\frac{\text{Adventure}}{\text{Science Fiction}} = \frac{24}{8}$$

Step 2: Simplify the fraction to lowest terms:

$$\frac{24}{8} = \frac{3}{1}$$

Step 3: Fill in the blanks with your final answer:

For every 3 people who saw an adventure movie, 1 saw a science fiction movie.

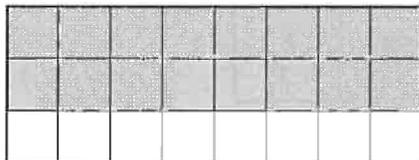
Complete the following statements. (DOK 2)

- For every _____ people who saw a comedy, _____ saw an adventure movie.
- For every _____ people who saw a fairy tale, _____ saw a romance movie.
- For every _____ people who saw an animation, _____ saw an adventure movie.
- For every _____ people who saw an adventure, _____ saw a science fiction movie.

6.6 Modeling Ratios (DOK 2, 3)

Models can also be used to express ratios.

Example 1: For every two female cheerleaders, there must be one male cheerleader to assist with jumps. The model below shows the ratio of female to male cheerleaders, $\frac{2}{1}$ or 2:1, when there is a full squad of 24.



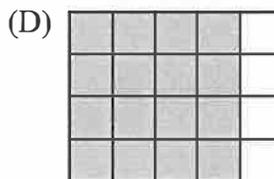
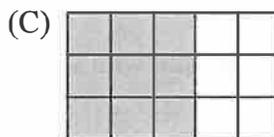
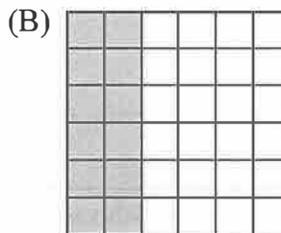
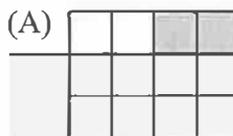
This model shows there are 16 female cheerleaders for every 8 male cheerleaders. The shaded portion is the number of female cheerleaders. The unshaded portion is the number of male cheerleaders.

Draw a model to represent each situation. (DOK 3)

- The ratio of computers to students is 1:2. The total number of students is 12.
- The ratio of boys to girls is $\frac{2}{3}$ in a class of 20.
- The ratio of dogs to cats at the pound is 3:5 with a total of 24 animals.
- The ratio of passing grades to failing grades is $\frac{4}{1}$ in a class of 25.

Match each situation to its model. (DOK 2)

- There are 3 new cars for every 2 used cars at a car lot.
- There is a boy for every girl at the dance.
- There are 4 bats for every ball in the gear bag.
- There are 2 roses for every 4 carnations in a vase.



Other ways to model ratios...

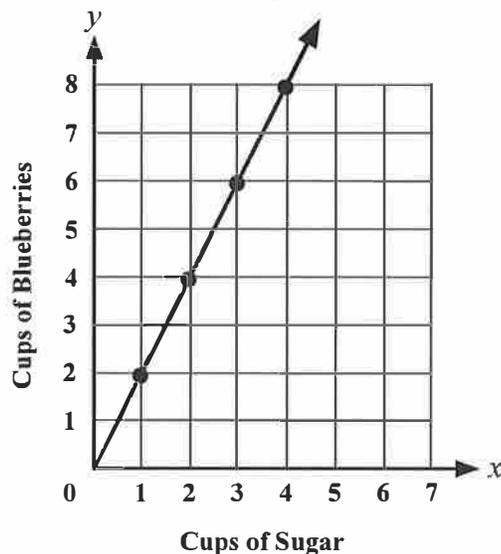
In chapter 5, you learned to plot points on a coordinate plane. Those points also demonstrate ratios. The coordinates (x, y) may be plotted as the ratio: $\frac{y}{x}$

Example 2: Mrs. Nelson is making blueberry jam. The ratio of berries to sugar is 2 cups of berries:1 cup sugar.

An equation for this recipe is $y = \frac{2}{1}x = 2x$

Step 1: Plot the points on a coordinate grid from the recipe table below.

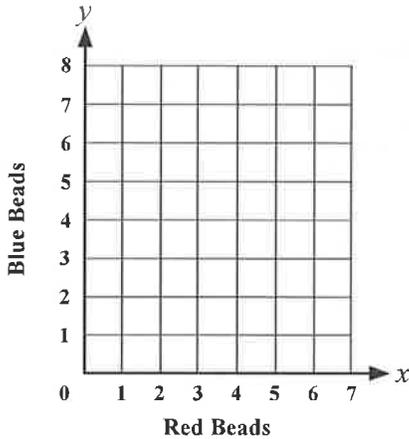
Cups of Sugar	Cups of Blueberries
Equation: $y = 2x$	
(x -coordinate)	(y -coordinate)
1	2
2	4
3	6
4	8



Plot the points from the ratio tables below. (DOK 2)

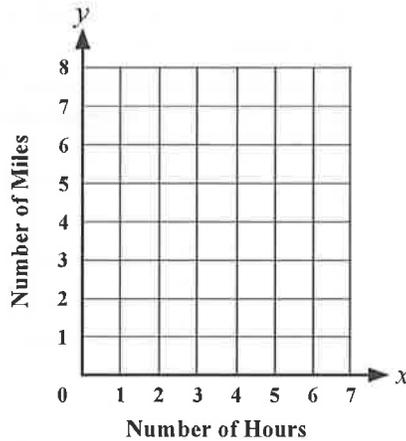
1. Emma is making red and blue hair decorations for herself and her friends. The ratio of red beads to blue beads is given in the table below.

Red beads (x)	Blue Beads (y)
Equation: $y = \frac{3}{2}x$	
2	3
4	6



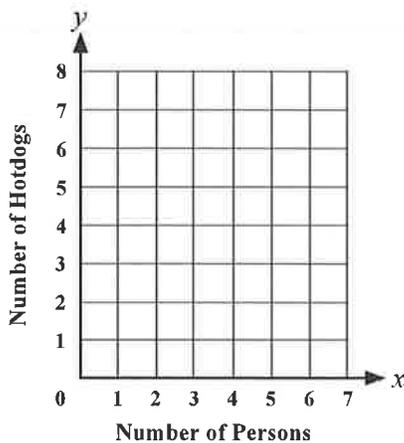
3. Enrique can walk an average of 3 miles per hour. The ratio of Enrique's miles per hour is in the table below.

Number of Hours (x)	Number of Miles (y)
Equation: $y = 3x$	
1	3
2	6



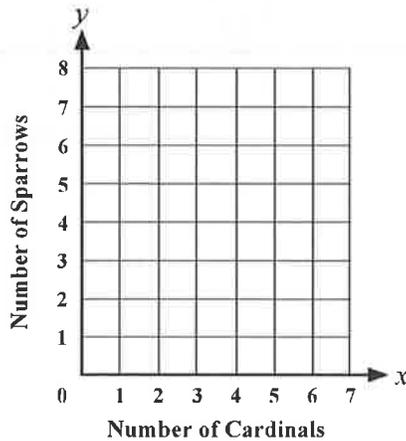
2. John cooks 2 hotdogs for everybody at the barbecue. The ratio of hotdogs to people is in the table below.

# of Persons (x)	# of Hotdogs (y)
Equation: $y = 2x$	
1	2
2	4
3	6



4. Marie went on a nature walk. For every cardinal she spotted, she saw 3 sparrows. Finish filling out the table of the ratio of sparrows to cardinals in the table below.

# of Cardinals (x)	# of Sparrows (y)
Equation: $y = 3x$	
1	
2	



More ways to model ratios...

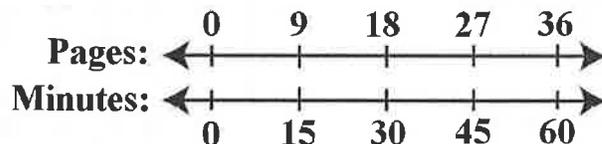
Example 3: Paul is reading a novel and wants to know how long it will take to read one chapter, which is 36 pages. He timed how long it took to read the first 9 pages. It took Paul 15 minutes to read the first 9 pages.

The ratio of pages read to minutes is $\frac{9}{15}$.

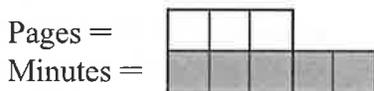
Model this ratio using an equation, a double number line, and a tape diagram.
Find the total number of minutes to read the book.

Step 1: The ratio may be expressed as the equation $y = \frac{9}{15}x$.

Step 2: The double number line shows the pages read on the top of the number line and the number of minutes on the bottom of the number line.



Step 3: A tape diagram shows the pages read on the top portion and the number of minutes on the bottom portion, in this case, in simplest form.



1) Write a ratio in each problem in simplest form. 2) Write an equation for each problem. 3) Draw a double number line for each problem. 4) Draw a tape diagram for each problem using the simplified ratio. Answer the ratio question. (DOK 3)

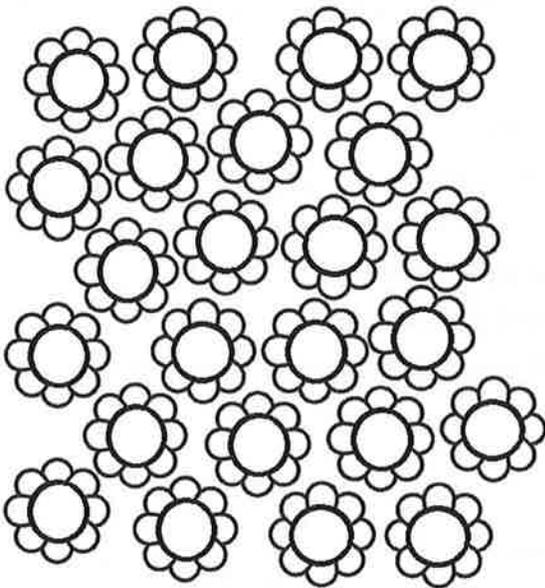
1. Sherrie makes lemonade using 1 lemon for every 2 pints of water. Write a ratio showing the number of lemons to pints of water.
2. Marta has 3 red beads for every 5 yellow beads on her necklace. Write a ratio showing the number of red beads to yellow beads.
3. Martin Mannion drove 50 miles for every 60 minutes of driving on an interstate car trip. Write a ratio showing the miles driven to minutes driven.
4. Mrs. Wilcox bought 2 pounds of onions for every 10 pounds of potatoes. Write a ratio showing the pounds of onions to pounds of potatoes.
5. Trevor uses 4 nails for every 6 feet of wood while making a tree house. Write a ratio showing the number of nails to feet of wood.

6.7 Word Problems Where Ratio is Given (DOK 2)

Solve the ratio problems below, which include a range of numbers allowed in the answer.

1. The ratio of yellow to red squares in the grid below is 4:5. Fill in the squares with Y for yellow or R for red so there are at least 6, but not more than 9 yellow squares.

2. There are 2 colors of flowers, violet and blue, in a vase. The ratio of violet to blue flowers is 5:3. There are at least 7, but not more than 11 blue flowers. How many of each color of flower are there in the vase? Write V for violet and B for blue in the flowers to display your answer.

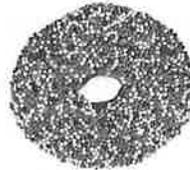


Number of violet flowers: _____

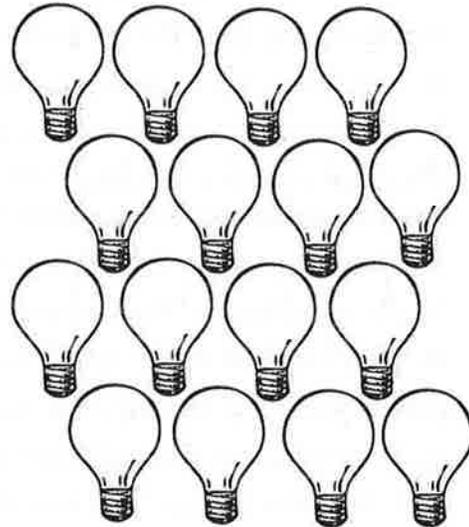
Number of blue flowers: _____

3. There are 2 kinds of doughnuts in a display case, chocolate frosted and frosted with sprinkles. The ratio of chocolate frosted to frosted with sprinkles is 8:7. If there are at least 178 total doughnuts, but not more than 182 doughnuts in the display case, how many are chocolate frosted and how many are frosted with sprinkles?





4. Amy's house has 16 light bulbs in ceiling units and lamps. The ratio of burnt out bulbs to bulbs still working is 1:3. Write a B in each bulb below that needs to be replaced in Amy's house.



Number of bulbs needing replacement:

1.1 Factors workspace

Name: _____

Homeroom: _____

1.	2.	3.	4.
5.	6.	7.	8.
9.	10.	11.	12.
13.	14.	15.	16.
17.	18.	19.	20.

6.1 Ratios s workspace

Name: _____

Homeroom: _____

1.	2.	3.	4.
5.	6.	7.	8.

6.2 Ratio Problems workspace

1.	2.	3.
4.	5.	6.

6.4 Equivalent Ratios workspace

Name: _____

Homeroom: _____

1.	2.	3.
4.	5.	6.
7.	8.	9.
10.	11.	12.

