Ratios Homework

Lesson 1

1. At the 6th grade school dance, there are 123 boys, 78 girls, and 12 adults.

    a. Write the ratio of number of boys to number of girls.

    b. Write the same ratio using another form (A: B vs. A to B).

    c. Write the ratio of number of boys to number of adults.

2. In the cafeteria, 100 milk cartons were put out for breakfast. At the end of breakfast, 19 remained.

    a. What is the ratio of milk cartons taken to total milk cartons?

    b. What is the ratio of milk cartons remaining to milk cartons taken?

3. Choose a situation that could be described by the following ratios, and write a sentence to describe the ratio in the context of the situation you chose.

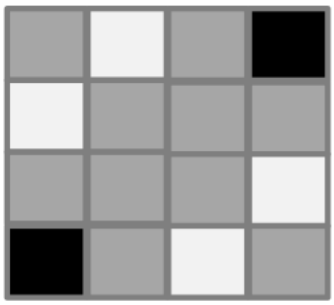
For example: 3: 2 When making pink paint, the art teacher uses the ratio 3: 2. For every 3 cups of white paint she uses in the mixture, she needs to use 2 cups of red paint.

    a. 3 to 4

    b. 19 to 20

Lesson 2

1. Using the floor tiles design shown below, create 4 different ratios related to the image. Describe the ratio relationship and write the ratio in the form A:B or the form A to B.



2. Billy wanted to write a ratio of the number of cars to the number of trucks in the police parking lot. He wrote 1:3. Did Billy write the ratio correctly? Explain your answer.

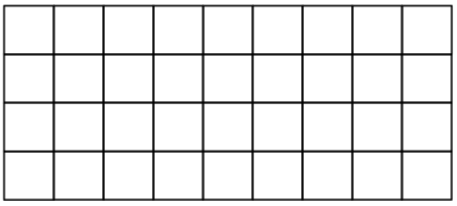
Lesson 3

1. Write two ratios that are equivalent to 1:1.

2. Write two ratios that are equivalent to 3:11.

3. a. The ratio of the width of the rectangle to the height of the rectangle is _____ to _____.

   b. If each square in the grid has a side length of 8 mm, what is the length and width of the rectangle?



4. For a project in their health class, Jasmine and Brenda recorded the amount of milk they drank every day. Jasmine drank 2 pints of milk each day, and Brenda drank 3 pints of milk each day.

   a. Write a ratio of number of pints of milk Jasmine drank to number of pints of milk Brenda drank each day.
   b. Represent this scenario with a tape diagram.
   c. If one pint of milk is equivalent to 2 cups of milk, how many cups of milk did Jasmine and Brenda each drink? How do you know?
   d. Write a ratio of number of cups of milk Jasmine drank to number of cups of milk Brenda drank.
   e. Are the two ratios you determined equivalent? Explain why or why not.

Lesson 4

1. **Use diagrams or the description of equivalent ratios to show that the ratios 2:3, 4:6, and 8:12 are equivalent.**

2. **Prove that 3:8 is equivalent to 12:32.**
    a. **Use diagrams to support your answer.**

    b. **Use the description of equivalent ratios to support your answer.**

3. **The ratio of Isabella's money to Shane's money is 3:11. If Isabella has $33, how much money do Shane and Isabella have together? Use diagrams to illustrate your answer.**

Lesson 5

1. Last summer, at *Camp Okey-Fun-Okey*, the ratio of the number of boy campers to the number of girl campers was 8:7. If there were a total of 195 campers, how many boy campers were there? How many girl campers?

2. The student–to–faculty ratio at a small college is 17:3. The total of students and faculty is 740. How many faculty members are there at the college? How many students?

3. The Speedy Fast Ski Resort has started to keep track of the number of skiers and snowboarders who bought season passes. The ratio of the number of skiers who bought season passes to the number of snowboarders who bought season passes is 1:2. If 1250 more snowboarders bought season passes than skiers, how many snowboarders and how many skiers bought season passes?

4. The ratio of the number of adults to the number of students at the prom has to be 1:10. Last year there were 477 more students than adults at the prom. If the school is expecting the same attendance this year, how many adults have to attend the prom?

Lesson 6

1. Shelley compared the number of oak trees to the number of maple trees as part of a study about hardwood trees in a woodlot. She counted 9 maple trees to every 5 oak trees. Later in the year there was a bug problem and many trees died. New trees were planted to make sure there were the same number of trees as before the bug problem. The new ratio of the number of maple trees to the number of oak trees is 3:11. After planting new trees, there were 132 oak trees. How many more maple trees were in the woodlot before the bug problem than after the bug problem? Explain.

2. The school band is comprised of middle school students and high school students, but it always has the same maximum capacity. Last year the ratio of the number of middle school students to the number of high school students was 1:8. However, this year the ratio of the number of middle school students to the number of high school students changed to 2:7. If there are 18 middle school students in the band this year, how many fewer high school students are in the band this year compared to last year? Explain.

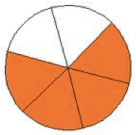
Lesson 7

1. Maritza is baking cookies to bring to school and share with her friends on her birthday. The recipe requires 3 eggs for every 2 cups of sugar. To have enough cookies for all of her friends, Maritza determined she would need 12 eggs. If her mom bought 6 cups of sugar, does Maritza have enough sugar to make the cookies? Why or why not?

2. Hamza bought 8 gallons of brown paint in order to paint his kitchen and dining room. Unfortunately, when Hamza started painting, he thought the paint was too dark for his house, so he wanted to make it lighter. The store manager would not let Hamza return the paint but did inform him that if he used ¼ of a gallon of white paint mixed with 2 gallons of brown paint, he would get the shade of brown he desired. If Hamza decided to take this approach, how many gallons of white paint would Hamza have to buy to fix his problem?

Lesson 8

1. The ratio of the number of shaded sections to the number of unshaded sections is 4 to 2. What is the value of the ratio of the number of shaded pieces to the number of unshaded pieces?



2. Use the value of the ratio to determine which ratio(s) is equivalent to 7:15.
   a. 21:45
   b. 14:45
   c. 3:5
   d. 63:135

3. Sean was at batting practice. He swung 25 times but only hit the ball 15 times.
   a. Describe and write more than one ratio related to this situation.

   b. For each ratio you created, use the value of the ratio to express one quantity as a fraction of the other quantity.

   c. Make up a word problem that a student can solve using one of the ratios and its value

4. Your middle school has 900 students. 13 of the students bring their lunch instead of buying lunch at school. What is the value of the ratio of the number of students who do bring their lunch to the number of students who do not?

Lesson 9

Assume each of the following represents a table of equivalent ratios. Fill in the missing values. Then choose one of the tables and create a real-world context for the ratios shown in the table.

1.

	22
12	
16	44
	55
24	66

2.

	14
15	21
25	35
30	

3.

	34
	51
12	
15	85
18	102

Lesson 10

1.

a. Create a ratio table for making lemonade with a lemon juice-to-water ratio of 1:3. Show how much lemon juice would be needed if you use 36 cups of water to make lemonade.

b. How is the value of the ratio used to create the table?

2. Ryan made a table to show how much blue and red he mixed to get the shade of purple he will use to paint the room. He wants to use the table to help him make larger and smaller batches of purple paint.

blue	red
12	3
20	5
28	7
36	9

a. What ratio was used to create this table? Support your answer.

b. How are the values in each row related to each other?

c. How are the values in each column related to each other?

Lesson 11

1. Saah and Eva were swimming. Use the ratio tables below to determine who the faster swimmer is

Sarah

Time (min)	3	5	12	17
Distance (meters)	75	125	300	425

Eva

Time (min)	2	7	10	20
Distance (meters)	52	182	260	520

Explain the method that you used to determine your answer.

2. A 120 lb. person would weigh about 20 lb. on the moon. A 150 lb. person would weigh 28 lb. on Io, a moon of Jupiter. Use ratio tables to determine which moon would make a person weigh the most.

Lesson 12

1. While shopping, Kyla found a dress that she would really like, but it costs $52.25 more than she has. Kyla charges $5.50 an hour for babysitting. She wants to figure out how many hours she must babysit to earn $52.25 to buy the dress. Use a double number line to support your answer.

2. Frank has been driving at a constant speed for 3 hours, during which time he traveled 195 miles. Frank would like to know how long it will take him to complete the remaining 455 miles, assuming he maintains the same constant speed. Help Frank determine how long the remainder of the trip will take. Include a table or diagram to support your answer.

3. Chris and Jenny are comparing two similar punch recipes. Each recipe calls for cranberry juice and giner ale but in different amounts. The tables below show the amounts of cranberry juice and ginger ale for four different quantities of punch.

Chris's Punch

Cranberry Juice (in cups)	Ginger Ale (in cups)
1	4
2	8
3	12
5	20

Jenny's Punch

Cranberry Juice (in cups)	Ginger Ale (in cups)
2	3
4	6
6	9
10	15

1. Is the proportion of the punch that is cranberry juice the same in each of Chris's recipes given in his table? Explain how you determined your answer.

2. Is the proportion of the punch that is cranberry juice the same in each of Jenny's recipes given in her table? Explain how you determined your answer.

3. Is the proportion of the punch that is cranberry juice the same in Chris's recipes as it is in Jenny's recipes? If not, whose punch is stronger, that is, contains a greater proportion of cranberry juice? Explain how you determined your answer.

Lesson 13

A cookie recipe calls for 1 cup of white sugar and 3 cups of brown sugar.

Make a table showing the comparison of the amount of white sugar to the amount of brown sugar.

White Sugar (W)	Brown Sugar (B)

1. Write the value of the ratio of the amount of white sugar to the amount of brown sugar.

2. Write an equation that shows the relationship of the amount of white sugar to the amount of brown sugar.

3. Explain how the value of the ratio can be seen in the table.

4. Explain how the value of the ratio can be seen in the equation.

Using the same recipe, compare the amount of white sugar to the amount of total sugars used in the recipe.

Make a table showing the comparison of the amount of white sugar to the amount of total sugar.

White Sugar (W)	Total Sugar (T)

5. Write the value of the ratio of the amount of total sugar to the amount of white sugar.

6. Write an equation that shows the relationship of total sugar to white sugar.

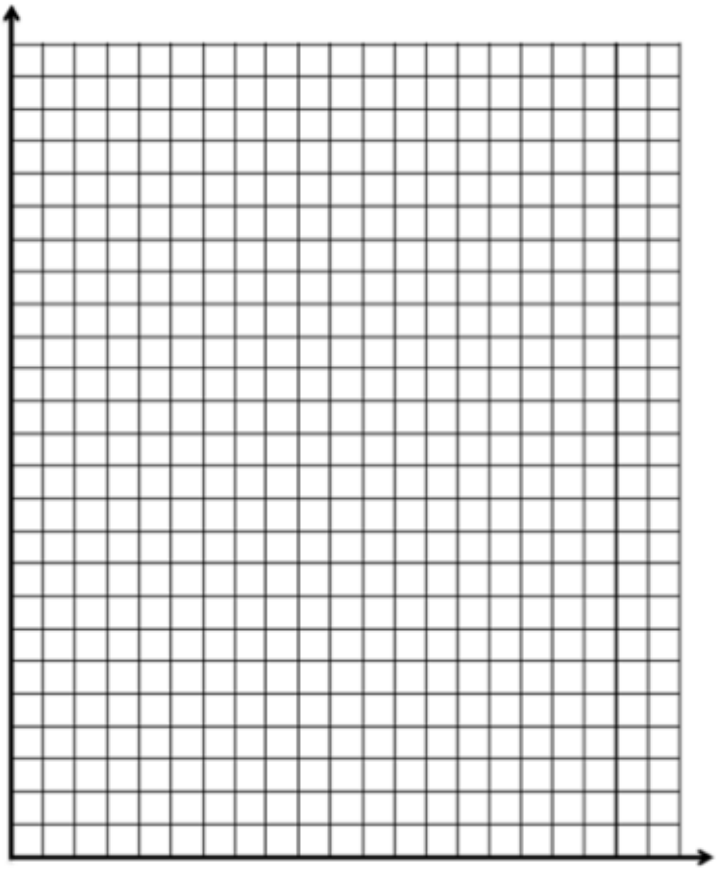
Lesson 14

Find the number of cups of sugar needed if for each pie Karrie makes, she has to use 3 cups of sugar.

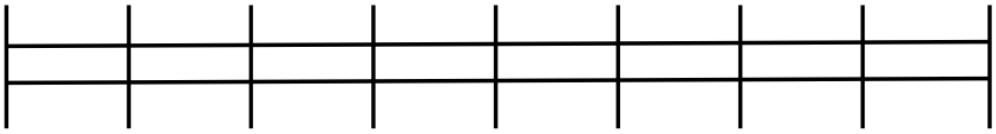
Complete the table of values:

Pies	Cups of sugar
1	
2	
3	
4	
5	
6	

Use a graph to represent the relationship:



Create a double number line diagram to show the relationship:



Write an equation to show the relationship.

Lesson 15

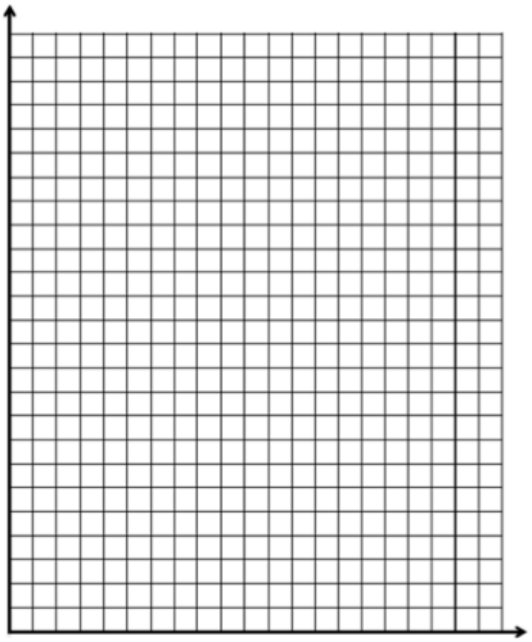
1. The producer of the news station posted an article about the high school's football championship ceremony on a new website. The website had 500 views after four hours. Create a table to show how many views the website would have had after the first, second, and third hours after posting, if the website receives views at the same rate. How many views would the website receive after 5 hours?

2. Write an equation that represents the relationship from question 1. Do you see any connections between the equations you wrote and the ratio of the number of views to the number of hours?

3. Use the table in question 1 to make a list of ordered pairs that you could plot on a coordinate plane.

4. Graph the ordered pairs on a coordinate plane. Label your axes and create a title for the graph. Connect the ordered pairs.

5. Predict how many views the website would have after 12 hours.



Lesson 16

The Scott family is trying to save as much money as possible. One way to cut back on the money they spend is by finding deals while grocery shopping; however, the Scott family needs help determining which stores have the better deals.

1. At Grocery Mart, strawberries cost $2.99 for 2lbs., and at Baldwin Hills Market strawberries are $3.99 for 3 lbs.

   a. What is the unit price of strawberries at each grocery store? If necessary, round to the nearest penny.

   b. If the Scott family wanted to save money, where should they go to buy strawberries? Why?

2. Potatoes are on sale at both Grocery Mart and Baldwin Hills Market. At Grocery Mart, a 5 lb bag of potatoes cost $2.85 and at Baldwin Hills Market a 7 lb bag of potatoes costs $4.20.

   a. Which store offers the best deal on potatoes?

   b. How do you know?

   c. How much better is the deal?

Lesson 17

1. Once a commercial plane reaches the desired altitude, the pilot often travels at a cruising speed. On average, the cruising speed is 570 miles/hour. If a plane travels at a cruising speed for 7 hours, how far does the plane travel while cruising at this speed?

2. Denver, Colorado often experiences snowstorms resulting in multiple inches of accumulated snow. During the last snow storm, the snow accumulated at $\frac{4}{5}$ inch/hour. If the snow continues at this rate for 10 hours, how much snow will accumulate?

3. A bookstore sells four non-fiction books for every 12 fiction books sold.

   a. What is the *ratio* of fiction books sold to non-fiction books sold?

   b. Write this ratio as a *unit rate* of fiction books to non-fiction books.

   c. Explain how you found the unit rate.

   d. Explain what the unit rate means within the context of this problem.

Lesson 18

1. Enguun earns $17 per hour tutoring student-athletes at Brookly University.
    a. If Enguun tutored for 12 hours this month, how much money did she earn this month?

    b. If Enguun tutored for 19.5 hours last month, how much did she earn last month?

2. The Piney Creek Swim Club is preparing for the opening day of the summer season. The pool holds 22,410 gallons of water, and water is being pumped in at 540 gallons per hour. The swim club has their first practice in 42 hours; will the pool be full in time? Explain your answer.

3. For every three books that Emily reads, Julia reads six books.

    a. What is the *ratio* of books read by Emily to books read by Julia?

    b. Write this ratio as a *unit rate* comparing Emily to Julia.

    c. Explain what the unit rate means within the context of this problem.

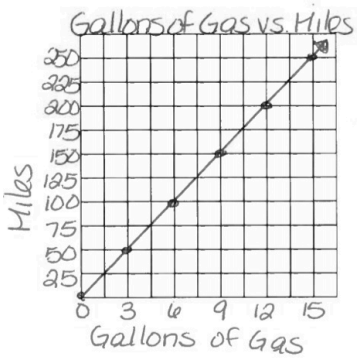
Lesson 19

1. Victor was having a hard time deciding on which new vehicle he should buy. He decided to make the final decision based on the gas efficiency of each car. A car that is more gas efficient gets more miles per gallon of gas. When he asked the manager at each car dealership for the gas mileage data, he received two different representations, which are shown below.

Vehicle 1: Legend

Gallons of Gas	4	8	12
Miles	72	144	216

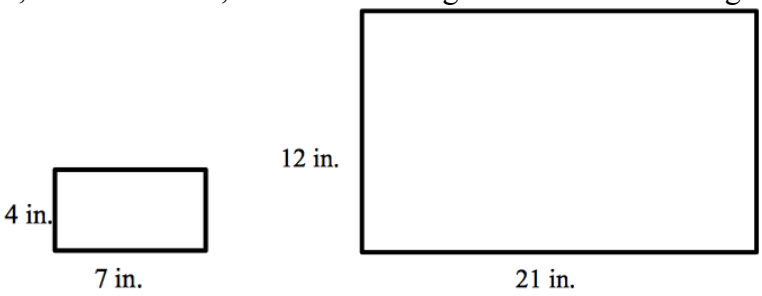
Vehicle 2: Supreme



a. If Victor based his decision only on gas efficiency, which car should he buy? Provide support for your answer.

b. After comparing the Legend and the Supreme, Victor saw an advertisement for a third vehicle, the Lunar. The manager said that the Lunar can travel about 289 miles on a tank of gas. If the gas tank can hold 17 gallons of gas, is the Lunar Victor's best option? Why or why not?

2. Mr. Warren, a math teacher, drew two rectangles on the board along with their lengths and widths.



He then asked his class to write ratios comparing the lengths and widths of the two rectangles and to explain their ratios.

> Student A said, "The length of the larger rectangle is 14 inches longer than the length of the smaller rectangle, so my ratio is 1:14."
>
> Student B said, "The width of the smaller rectangle is 8 inches shorter than the width of the larger rectangle, so my ratio is 1:8."
>
> Student C said, "The width of the larger rectangle is three times the width of the smaller rectangle, so my ratio is 1:3."

Evaluate each student's reasoning to determine who is correct. Explain and justify your conclusion.

Lesson 20

The table below shows the amount of money Gabe earns working at a Coffee Shop.

Hours Worked	3	6	9	12
Money Earned	40.50	81.00	121.50	162.00

1. How much does Gabe earn per hour?

2. Jordan is another employee at the same coffee shop. He has worked there longer than Gabe and earns $3 more per hour than Gabe. Complete the table below to show how much Jordan earns.

Hours Worked	4	8	12	16
Money Earned				

3. Serena is the manager of the coffee shop. The amount of money she earns is represented by the equation: $m = 21h$ where h is the number of hours Serena works and m is the amount of money she earns. How much more money does Serena make an hour than Gabe? Explain your thinking.

4. After another month of work, Jordan received a promotion and became a manager. He now earns the same amount as Serena. How much more does he earn per hour now that he is a manager than before his promotion? Explain your thinking.

Lesson 21

1. 7 ft. = _____ in.
2. 100 yd. = _____ ft.
3. 25 m = _____ cm
4. 5 km = _____ m
5. 96 oz. = _____ lb.
6. 2 mi. = _____ ft.
7. 2 mi. = _____ yd.
8. 32 fl. oz. = _____ c.
9. 1,500 ml = _____ l
10. 6 g = _____ mg

11. Beau buys a 3 pound bag of trail mix for a hike. He wants to make one-ounce bags for his friends with whom he is hiking. How many one-ounce bags can he make?_____
12. The maximum weight for a truck on the New York State Thruway is 40 tons. How many pounds is this?_____
13. Claudia's skis are 150 centimeters long. How many meters is this?_____
14. Claudia's skis are 150 centimeters long. How many millimeters is this?_____

Lesson 22

1. If Adam's plane traveled at a constant speed of 375 miles per hour for six hours, how far did the plane travel?

2. A Salt March Harvest Mouse ran a 360 centimeter straight course race in 9 seconds. How fast did it run?

3. Another Salt Marsh Harvest Mouse took 7 seconds to run a 350 centimeter race. How fast did it run?

4. A slow boat to China travels at a constant speed of 17.25 miles per hour for 200 hours. How far was the voyage?

5. The Sopwith Camel was a British, First World War, single-seat, biplane fighter introduced on the Western Front in 1917.

6. Traveling at its top speed of 110 mph in one direction for 2 ½ hours how far did the plane travel?

7. A world class marathon runner can finish 26.2 miles in 2 hours. What is the rate of speed for the runner?

8. Banana slugs can move at 17 cm per minute. If a banana slug travels for 5 hours, how far will it travel?

Lesson 23

1. Who walks at a faster rate: someone who walks 60 feet in 10 seconds or someone who walks 42 feet in 6 seconds?

2. Who walks at a faster rate: someone who walks 60 feet in 10 seconds or someone who takes 5 seconds to walk 25 feet?

3. Which parachute has a slower decent: a red parachute that falls 10 feet in 4 seconds or a blue parachute that falls 12 feet in 6 seconds?

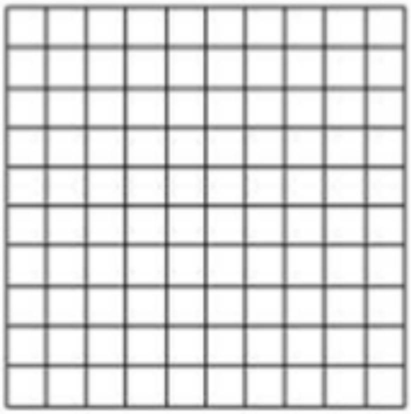
4. During the winter of 2012-2013, Buffalo, New York received 22 inches of snow in 12 hours. Oswego, New York received 31 inches of snow over a 15 hour period. Which city had a heavier snowfall rate? Round your answers to the nearest hundredth.

5. A striped marlin can swim at a rate of 70 miles per hour. Is this a faster or slower rate than a sailfish, which takes 30 minutes to swim 40 miles?

6. One math student, John, can solve these 6 math problems in 20 minutes while another student, Juaquine, can solve them at a rate of 1 problem per 4 minutes. Who works faster?

Lesson 24

1. Marissa just bought 100 acres of land. She wants to grow apples, peaches, and cherries on her land. Color the model to show how many acres she will use for each type of tree that she will grow.



Fruit	Percentage	Fraction	Decimal
Apple			
Peach			
Cherry			

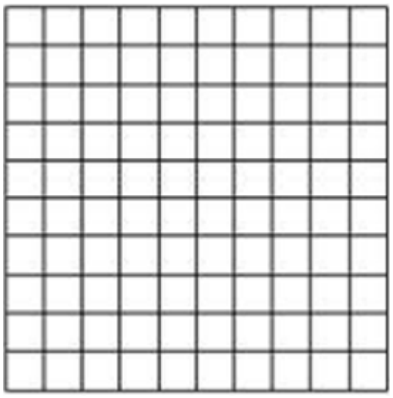
2. After renovations on Kim's bedroom, only 30 percent of one wall is left without any décor. Shade the wall to represent the space that is left to decorate.

.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

a. What does each square represent?

b. What percent has been decorated?

Lesson 25



1. Use the 10 x 10 grid to express the fraction 11/20 as a percent.

2. Use a tape diagram to relate the fraction 11/20 to a percent.

3. How are the diagrams related?

4. What decimal is also related to the fraction?

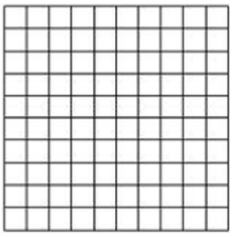
5. Which diagram is the most helpful for converting the fraction to a decimal? Explain why.

Lesson 26

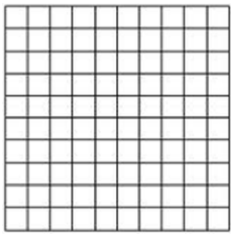
1. What is 15% of 60? Create a model to prove your answer.

2. If 40% of a number is 56, what was the original number?

3. In a 10 x 10 grid that represents 800, one square represents _____.
   Use the grids below to represent 17% and 83% of 800.



17% of 800 is _____.



83% of 800 is _____

Lesson 27

1. Mr. Yoshi has 75 papers. He graded 60 papers, and he had a student grade the rest. What percent of the papers did each person grade?

2. Mrs. Bennett has graded 20% of her 150 students' papers. How many papers does she still need to finish?

3. Carlos predicts that his math homework will take him 60 of the total of 75 minutes he has available for homework tonight.

   a. At this rate, how many minutes would Carlos spend on math homework out of a total of 100 available minutes? Explain or show your calculations.

   b. What percentage of the available homework time will Carlos spend doing math? Explain how the answer to this question is related to the answer of part a.

Lesson 28

1. The Sparkling House Cleaning Company has cleaned 28 houses this week. If this number represents 40% of the total number of houses they are contracted to clean, how many total houses will the company clean by the end of the week?

2. Joshua delivered 30 hives to the local fruit farm. If the farmer has paid to use 5% of the total number of Joshua's hives, how many hives does Joshua have in all?

Lesson 29

1. Henry has 15 lawns mowed out of a total of 60 lawns. What percent of the lawns does Henry still have to mow?

2. Marissa got an 85% on her math quiz. She had 34 questions right. How many questions were on the quiz?

3. Lucas read 30% of his book containing 480 pages. What page is he going to read next?