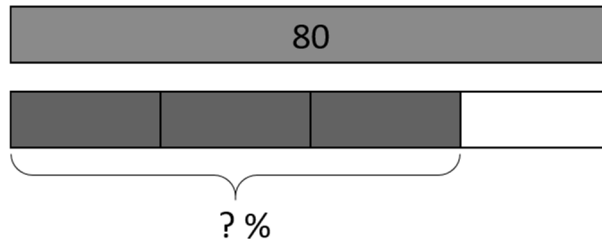


Let's Do Some Math

Notice and Wonder



Standards Unpacking

Key	Standard	Prerequisites/Vocabulary
Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	6.RP.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."	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	6.RP.2 - <u>Understand</u> the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and <u>use rate language</u> in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	6.RP.3 - Solve <u>real-world and mathematical problems</u> by writing and solving equations and inequalities of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers. Inequalities will include $<$, $>$, $\leq$, and $\geq$.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?

Put a box around the conceptual component of the standard. Underline the <u>procedural/fluency component</u> of the standard. Put a cloud around the  application component of the standard.	6.RP.3a - Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. <u>Recognize</u> that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; <u>represent</u> solutions of such inequalities on number line diagrams.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	6.RP.3b - Solve unit rate problems including those involving unit pricing and constant speed. <i>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 unit rate were lawns being mowed?</i>	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	6.RP.3c - <u>Find</u> a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); <u>solve problems</u> involving finding the whole, given a part and the percent.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	6.RP.3d - Use ratio reasoning to <u>convert</u> measurement units; <u>manipulate and transform</u> units appropriately when multiplying or dividing quantities.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?

LESSON 4: Ratios and Unit Rates

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

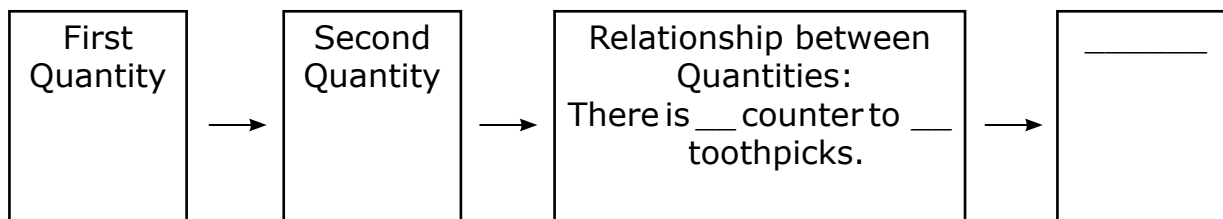
Eric's mother is making punch for his school party. She needs to serve 72 students and 4 teachers. If the recipe calls for 4 cups of water for every 2 cups of juice, how many cups of water will be needed for each cup of juice?

S Underline the question.

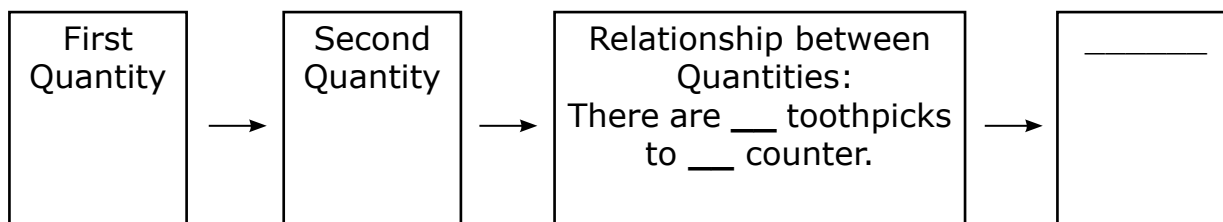
This problem is asking me to find _____.

Directions: Complete this page with your teacher and partner.

1. The relationship of the counters to the toothpicks is _____.



2. The relationship of the toothpicks to the counters is _____.



3. What is a ratio?

4. How is a ratio written?

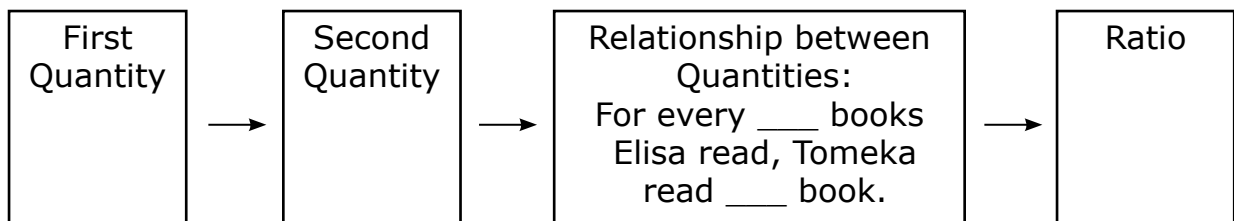
LESSON 4: Ratios and Unit Rates

Directions: Complete this page with your teacher and partner.

Use the following table to answer Questions 1 – 5.

Number of Books Read in One Week	
Student	Number of Books Read
Andy	2
Marcus	3
Mario	2
Tomeka	1
Elisa	3
Marcia	1

1. What is the relationship between the number of books Elisa read and the number of books Tomeka read?



2. What is the relationship between the number of books Andy read and the number of books Elisa read?
3. What is the ratio of the number of books Mario read and the total number of books read?
4. What is the ratio of the number of books Marcia read to the total number of books read?
5. What is the ratio of the number of books Elisa read to the total number of books read?

LESSON 4: Ratios and Unit Rates

Directions: Complete this page with your teacher and partner.

1.

How many toothpicks? _____

How many counters? _____

What is the ratio of toothpicks to counters? _____

How many equal groups can be created with 1 counter in each group? _____

How many toothpicks are in each group? _____

How many counters are in each group? _____

What is the unit rate for each group? _____

2.



How many stars? _____

How many moons? _____

What is the ratio of stars to moons? _____

How many equal groups can be created with 1 moon in each group? _____

How many stars are in each group? _____

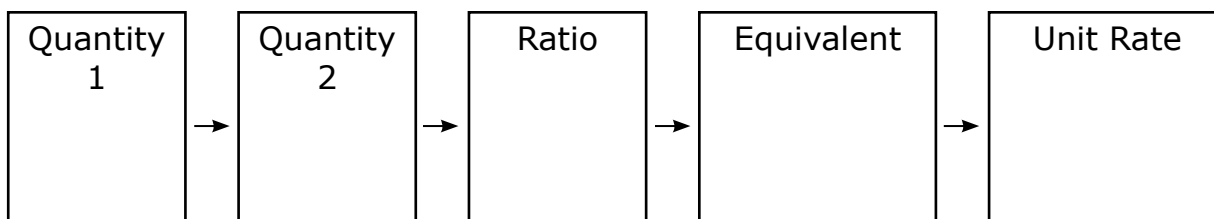
How many moons are in each group? _____

What is the unit rate for each group? _____

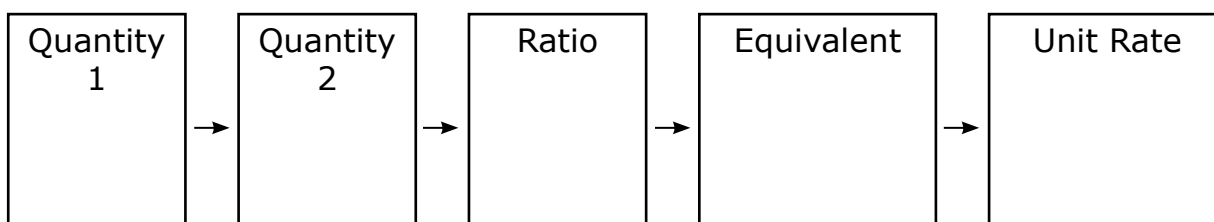
LESSON 4: Ratios and Unit Rates

Directions: Complete this page with your teacher and partner.

1. What is the unit rate of water to 1 cup of juice if the ratio of water to juice is 9:3?



2. What is the unit rate of the containers of sand to 1 container of dirt if the ratio of sand to dirt is 10:5?



3. What is the unit rate of the price of the pencils if the price of the pencils is 80 cents for 8 pencils?

4. If a recipe has a ratio of 3 cups of sugar to 6 cups of flour, what is the unit rate for 1 cup of flour?

5. If \$25 is paid for 5 meals, what is the unit rate for 1 meal?

LESSON 5: Ratios and Tables

Directions: Complete this page with your teacher and partner.

1. Complete the table to show the ratio of counters to toothpicks.
What is the unit rate?

○

○

○

○

○

○

○

○

Counters					
Toothpicks					

2. Complete the table to show the ratio of circles to squares.
What is the unit rate?

○

○

○

○

○

○

○

○

□

□

□

□

□

□

□

□

Circles					
Squares					

3. Complete the table to show the ratio of suns to stars.
What is the unit rate?

☀

☀

☀

☀

☀

★

☀

☀

☀

☀

☀

★

☀

☀

☀

☀

☀

★

Suns						
Stars						

LESSON 5: Ratios and Tables

Directions: Complete this page with your teacher and partner.

Hours (h)	Miles (m)	
1		
2		
3	15	
4		
5	25	
6		
7		
8	40	

1. What is different about this table than the tables on S42?
2. Complete the table and determine the unit rate.
3. What is being compared in the table?
4. What variable in the table represents miles?
5. What variable in the table represents hours?
6. How can we describe the relationship between miles and hours by using the variables m and h ?
7. Describe how the unit rate is used to describe the relationship.
8. Using this ratio table, we can write the values in each row as a _____.
9. What is the first coordinate pair in the table?
10. What is the second coordinate pair in the table?

Complete the rest of the table by filling in the coordinate pairs in each row.

We will examine using a double number line as strategy to solve problems. We will use this to find the rates or values based on a given rate. This is a strategy that promotes number sense and reasoning.

Question: How can we break up the number lines into intervals that will help us find a given value based on a known rate?

Problem 1:

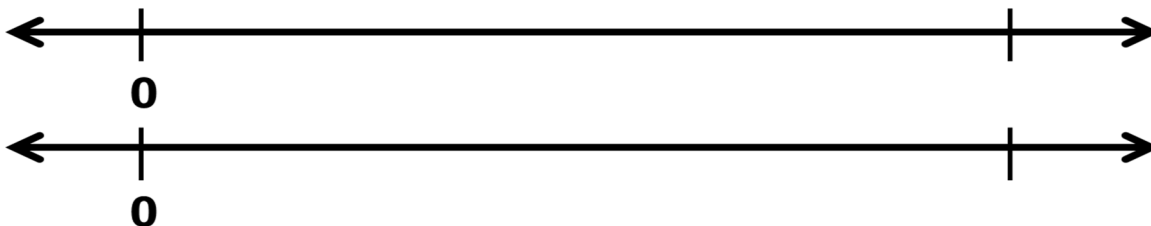
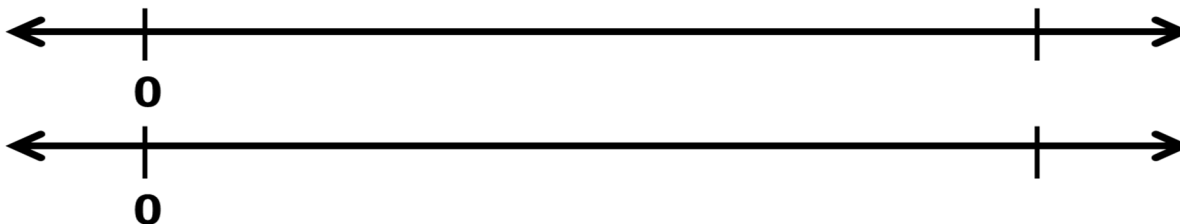
Amy can ride her bike 4 miles in 30 minutes. Sebastian can ride his bike 3 miles in 24 minutes.

Part A

At her current rate, what is the distance, in miles, Amy can ride her bike in 12 minutes?

Part B

At his current rate, what is the distance, in miles, Sebastian can ride his bike in 1 hour?

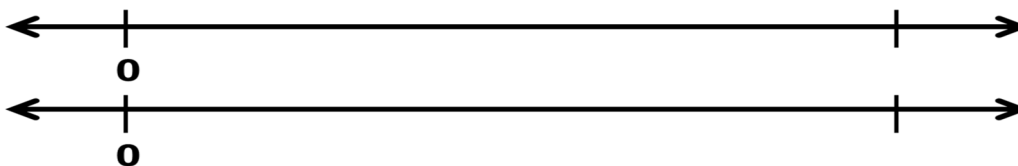


Problem 2:

When a person put a quarter in a parking meter, the person can park a car for 15 minutes. The amount of time a person can park is proportional to the amount of money put in the parking meter.

Rita put coins in the parking meter to park for 1 hour and 24 minutes.

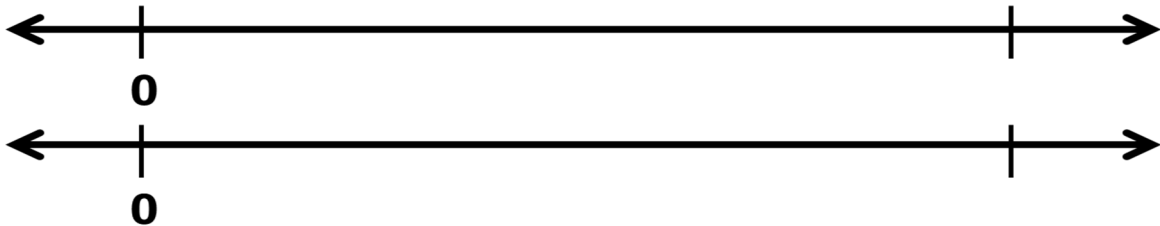
What amount of money is required to park for exactly 1 hour and 24 minutes? Show or explain the steps you used to determine the answer.



Problem 3:

Caleb is making a soil mix that is 8 parts dirt to 3 parts peat moss. Which of the following best describes the amount of dirt he should use for every 1 cup of peat moss?

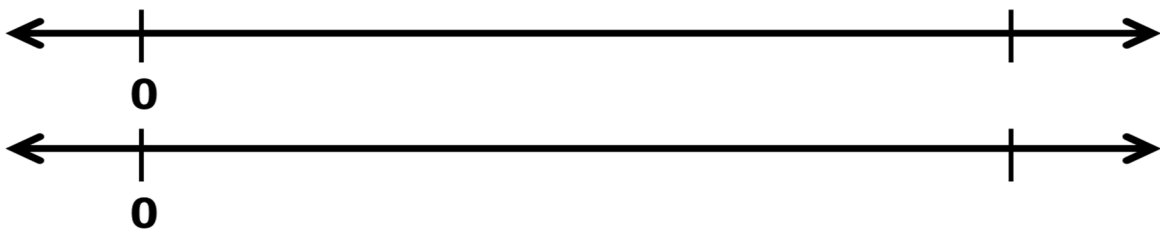
- A. He should add between $\frac{1}{4}$ cup and $\frac{1}{2}$ cup of dirt.
- B. He should add between $\frac{1}{2}$ cup and 1 cup of dirt.
- C. He should add between 1 cup and 2 cups of dirt.
- D. He should add between 2 cups and 3 cups of dirt.

**Problem 4:**

A machine in a factory makes chairs at a rate of 2 chairs every 10 minutes.

- How much time does the machine take to make 5 chairs?
- How many minutes would it take for the factory to fulfill an order for 32 chairs.

Show your work or explain how you determined your answers.



LESSON 5: Ratios and Tables

Directions: Complete this page with your teacher and partner.

1. Car 1

Gallons of Gas		2	3	4	5	
Miles	30	60		120		180

Car 2

Gallons of Gas		2	3	4	5	
Miles	25		75		125	150

What is the unit rate for Car 1? _____

Car 2? _____

Which car gets the best gas mileage? _____

How do you know? _____

What is the difference in the amount of gasoline Cars 1 and 2 will need to travel 300 miles? _____

2. Student 1

Week	3			6	7	
Pages Read	6	8	10		14	

Student 2

Week	3			6	7	
Pages Read	9	12		18		24

What is the unit rate for the number of pages read by Student 1? _____

What is the unit rate for the number of pages read by Student 2? _____

How many more pages would Student 1 have to read in Week 3 to have read the same number of pages as Student 2 on Week 3? _____

How do you know? _____

What is the difference in the number of pages read at the end of 8 weeks by Student 1 and Student 2? _____

LESSON 7: Percent as a Rate per 100

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Tadarius is going to start soccer. He has to purchase a uniform, shoes, and a soccer ball. The shoes are \$20, the uniform is \$48, and the soccer ball is \$22. If the shoes are on sale for 25% off the regular price, how much is the discount?

S Underline the question.

This problem is asking me to find _____

_____.

Directions: Complete this page with your teacher and partner.

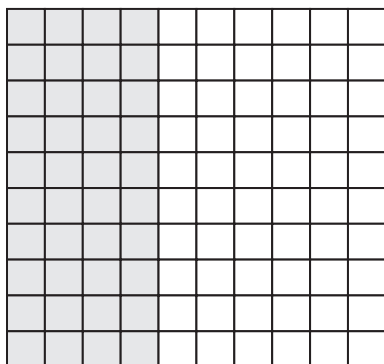
Blue: Ratio: _____ Percent Shaded: _____
Green: Ratio: _____ Percent Shaded: _____
Orange: Ratio: _____ Percent Shaded: _____
Red: Ratio: _____ Percent Shaded: _____
Not Shaded: _____ Ratio:Percent Not Shaded: _____
What does the word percent mean? _____

LESSON 7: Percent as a Rate per 100

Directions: Complete this page with your teacher and partner.

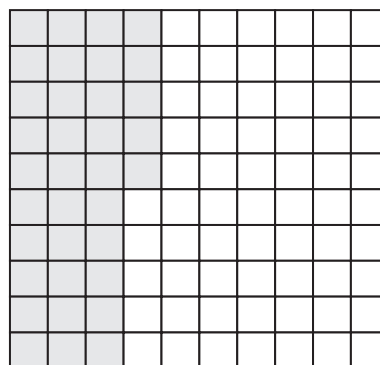
1. What is 40% of 100? _____

Write as a ratio. _____



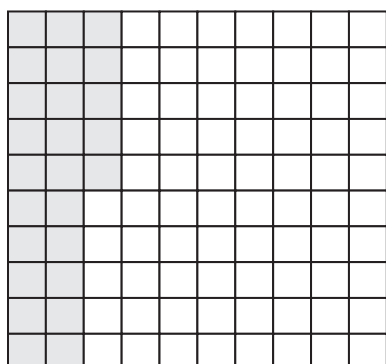
2. What is 35% of 100? _____

Write as a ratio. _____



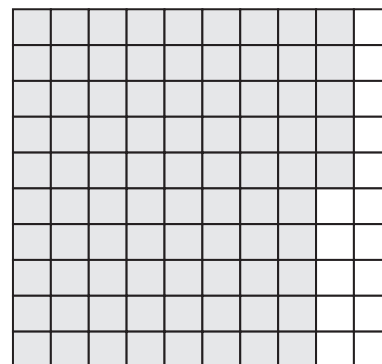
3. 25 is what percent of 100? _____

Write as a ratio. _____



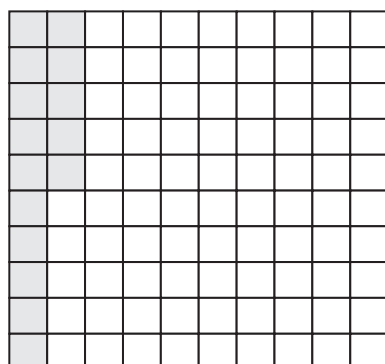
4. 85 is what percent of 100? _____

Write as a ratio. _____



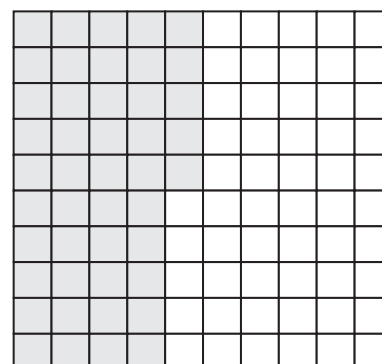
5. 15 is 15% of what number? _____

Write as a ratio. _____



6. 45 is 45% of what number? _____

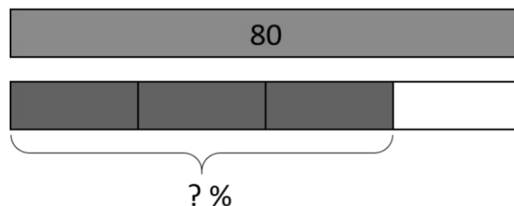
Write as a ratio. _____



Percents with Tape Diagrams

Let's return to our tape diagrams.

1. What questions might represent this model?

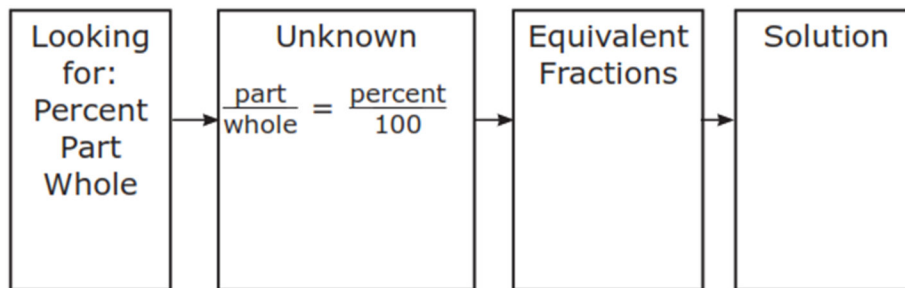


2. How could we find the value of the “?”

Creating and Using Tape Diagrams as a Model

3. 30 is 50% of what number?

Complete the graphic organizer to identify what we are finding in this problem.



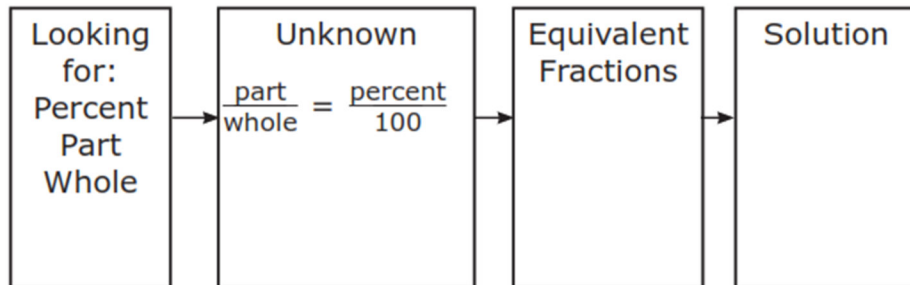
How can we partition the tape diagram to model the problem?

Number

Percent

4. What number is 20% of 10?

Complete the graphic organizer to identify what we are finding in this problem.



How can we partition the tape diagram to model the problem?

Number

Percent

5. At the concert, 20% of the audience members were teenagers. If the number of teenagers at the concert was 360, what was the total number of audience members?

How can we partition the tape diagram to model the problem?

Number

Percent

6. The circus had one performance at the Dewey Civic Center and one at the Atlantic Auditorium. The Dewey Civic Center has 1,600 seats. Ticked for 85% of the total number of seats were sold at the Civic Center. How many seats were sold? How can we partition the tape diagram to model the problem?

Number

Percent

7. Natalie uses a 15% off coupon when she buys a camera. The original price of the camera is \$45.00. How much money does Natalie save by using the coupon?

How can we partition the tape diagram to model the problem?

Number

Percent

8. Natalie uses a 15% off coupon when she buys a camera. The original price of the camera is \$45.00. How much money does Natalie save by using the coupon?

Number

Percent

9. The number of blueberry muffins that a baker makes each day is 40% of the total number of muffins she makes.

Part A

On Monday, the baker makes 36 blueberry muffins.

What is the total number of muffins that the baker makes on Monday?

Part B

On Tuesday, the baker makes a total of 60 muffins.

How many blueberry muffins does the baker make on Tuesday?

Understanding Reasoning and Modeling Questions

Use this sheet as a reflection tool to support the understanding of the evidence statement around the reasoning questions. After you engage/learn about the questions, use the tool to make notes around your take aways and implementation ideas.

Current Unit Topics:**Evidence Statement for Reasoning**

What Content Standards
Are Addressed in This
Evidence Statement
from the Current Unit?

Takeaways About the
Statement – What Do
Students Need to Be
Able to Do

What Should Be Evident
in a Student Response

Reasoning Question – 6.C.8 – 1

Used from: NJ Released Questions – 6.C.8 – 1 – Ratio and Proportional Relationships – 2017 – M21023

A bag contains only red and blue marbles. There are a total of 36 marbles in the bag. There are 5 red marbles for every 4 blue marbles in the bag. A student removes 1 blue marble from the bag. The student reasons that there are now 5 red marbles in the bag for every 3 blue marbles since $4 - 1 = 3$

- Explain the error in the student’s reasoning.
- Compute the correct ratio of red to blue marbles after the student draws 1 blue marble. Show your work or explain your answer.

Enter your answer and your work or explanation in the space provided.