Packet Due Date: _____



Ratios and Proportional Relationships:

<u>Unit 6 – Part 1:</u> Unit Rate Conversions

How does solving problems with equivalent ratios relate to algebra?

Standard	Description
7.RP.A.3	\rightarrow Use proportional relationships to solve multistep ratio and percent problems.
7.EE.B.4	→Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Packet Completion Rubric				
4	3	2	1	0
Workbook demonstrates significant effort. Student utilizes notes to help extend their thinking, writing questions, comments or reactions to the content.	Workbook demonstrates some effort. Student takes notes but could further understanding by questioning and interacting with the material.	Workbook shows little effort. Student takes notes sporadically, and could benefit from greater consistency with the material.	Workbook shows little to no effort. Student does not take notes and must demonstrate future interaction with the material to aid understanding.	Workbook is entirely incomplete or not turned in.

Grading Breakdown: 3.5 - 4 = A 3 - 3.4 = B 2.5 - 2.9 = C 2 - 2.4 = D 0 - 1.9 = F

"There are no shortcuts to any place worth going." -Beverly Sills

Unit 6 Part 1 Guiding Question:



<u>Lesson Objectives</u>	
Lesson:	<u>I can:</u>
G 6.1	 Convert a unit of measurement by multiplying with a unit rate equivalent to 1 Solve equivalent ratio problems with the use of scale factor
G 6.2	 Convert multiple units of measurement by multiplying with unit rates equivalent to Solve equivalent ratio problems with the use of scale factor

Unit 6: Unit Rate Con	version (Part 1)	Lesson 6.1
Lesson 6.1 Do Now	Tori swims 200 yards in 4 minute Rewrite the given information as 1. Ratio:	es. a
	2. Unit Rate:	
	3. Describe the units used in	n the rate:
	When Abby went skydiving she w Rewrite the given information as 1. Ratio:	as descending at a rate of 120 miles per hour. a
	2. Unit Rate:	
	3. Describe the units used in	n the rate:
Homework Reminder	This is where you will The	shade in the box if you turned in your homework. e is no homework due today! :)
Check-In	What is one thing you are hopefu	l for today?
	Come up with one nice thing you below.	could do for someone else by the end of the day and write it

the lines provided for you.			
$\frac{4}{4}$	$\frac{1+1}{3-1}$	<u>12 inches</u> 1 foot	

	In	struction	
are <i>rat</i> value that is equivalen	<i>ios</i> between two related <i>unit</i> s t to 1.	s of measurements. A rate	e can be written so that it has a
Example of rates with a value of 1:	$\frac{60 \ seconds}{1 \ minute} = 1$	$\frac{5280 \ feet}{1 \ mile} =$	$\frac{1 \text{ mile}}{1} = 1$
In each of the rates in are expressed in differ value of the fraction is	the example above, the deno ent units. When the numerat 1.	minator and the numerat for and denominator are o	or have the same measure, but equivalent to one another, the
*Trivia Questic	on: $\frac{2}{4} \times 1 =$		
Today we will be us	ing unit rates, like the or	nes listed above, to co	nvert rates to different units.
For example, if Nancy	can walk 2 miles in 25 mini	ıtes, then how many feet	did she walk in 1 second?
In this qu	estion we would n	eed to convert _	to
	and	to	•
<u>Converting Un</u>	<u>its 101:</u>		
1. Charlie is buildin equivalent to? (I	ng a model race track that is 5 fe Hint: 1 foot = 12 inches)	eet long. How many inches v	would Charlie's race track be
Another approach	n to converting feet to i	nches:	
Step 1. Write the information that is given as a fraction.			
Step 2. Multiply using a rate equivalent to 1, to convert feet to inches.	$\frac{5 feet}{1} \times -$	<u>inches</u> feet =	

Step 3. Simplify	=
Step 4. Restate your final answer.	Charlie's model race track is in length.
2. Dan estimates moving? (Hin	that when he is skateboarding he is moving at 15 miles per hour. How many feet per hour is Dan t 1 mile = 5280 feet)
Another approac	ch to converting miles to feet:
Step 1. Write the information that is given as a fraction.	*Keep in mind we write ratios with time or items in the denominator
Step 2. Multiply using a rate equivalent to 1, to convert miles to feet.	$\frac{15 \text{ miles}}{1 \text{ hour}} \times \frac{\text{feet}}{\text{miles}} =$
Step 3. Simplify	=
Step 4. Restate your final answer.	Dan is moving on his skateboard at a speed of feet per hour.
3. Javier drove 25 minutes)	80 miles in 4 hours. How many minutes does it take Javier to drive 280 miles? (Hint: 1 hour= 60
Another approa	ch to converting hours to minutes:
Step 1. Write the information	*Keep in mind we write ratios with time or items in the denominator

that is given as a fraction.	
Step 2. Multiply using a rate equivalent to 1, to convert hours to minutes.	$\frac{miles}{hours} \times \frac{hour}{minutes} = \frac{1}{1}$
Step 3. Simplify	=
Step 4. Restate your final answer.	Javier is driving at a rate of miles in 240 minutes.
4. Jennifer sold 7 selling every 10	20 cupcakes in 6 hours while working at the farmers' market. How many cupcakes was Jennifer 0 minutes?
Step 1. Write the information that is given as a fraction.	*Keep in mind we write ratios with time or items in the denominator
Step 2. Multiply using a rate equivalent to 1, to convert hours to minutes.	× =
Step 3. Simplify	=
Step 5. Use proportional reasoning to solve the number of cupcakes sold in 10 minutes.	
Step 4. Restate your final answer.	Jennifer sells cupcakes in 10 minutes.

	Your Turn!
1. 280 yards per 1	10 minutes is how many feet per 10 minutes?
Step 1. Write the information that is given as a fraction.	*Keep in mind we write ratios with time or items in the denominator
Step 2. Multiply using a rate equivalent to 1, to convert yards to feet.	*Hint: When multiplying inches should be in the denominator
Step 3. Simplify	
Step 4. Restate your final answer.	
2. 300 yards per ;	30 minutes is 300 yards per how many seconds?
Step 1. Write the information that is given as a fraction.	
Step 2. Multiply using a rate equivalent to 1, to convert minutes to hours.	
Step 3. Simplify	

Let's try one more for good luck!

1. Mackenzie and her sailing crew are sailing from California to Hawaii. They are moving at a rate of 192 miles per day. How many miles per hour are they moving?

2. How many miles will Mackenize and her crew sail in a 7 hour time period?

<u>Guide</u>	<u>d Practice</u>		
Directions: Answer each of the following question. Use a separate sheet of notebook paper as neede			parate sheet of notebook paper as needed.
1.	316 yards in 12 seconds is how many feet in 12 seconds?	2.	30 inches in 7 minutes is 30 inches per how many seconds?
3.	72 miles in one day is 72 miles per how many hours?	4.	320 feet in 70 seconds is how many inches per 70 seconds?

5. 15 miles per 2 hours is how many feet per 2 hours?	6. 99 miles in 3 minutes is how many yards in 3 minutes?
7. A certain spaceship flies 6,000 miles in 3 hours. How many minutes does it take the spaceship to fly 6,000 miles?	8. Jeremy threw a baseball that flew a speed of 90 miles per hour. How fast is this baseball moving in feet per hour?
9. Jacob does 28 math problems in 1 hour. How many math problems can job do in 10 minutes?	10. Ariel will use 280 yards of yarn to knit 3 blankets. How many feet of yarn will Ariel use to knit 3 blankets?
11. Challenge: Jodi runs 3 miles in 20 minutes. How many inches does she run in 20 minutes?	12. Challenge: Carolina swims 4 miles in 2 hours. How many inches is this per hour?

Fun Facts About Measuring When You Don't Have Ruler

There are those times when you need to measure stuff but you are fresh out of rulers, tape measures or other measuring tools. Here are some ways to make due until you get a more accurate tool.

- The distance from the tip of your thumb to the first knuckle can be used to approximate one inch or 2.45 cm.
- Roman merchants would measure yards of cloth by using the tip of their noses to the tips of their outstretched arms would be close to 36 inches or 91.44 cm.
- If you ever wondered what Noah used to measure a *"cubit"* to build the ark, you would measure the distance from your bent elbow to the tip of your middle finger or about 18 inches or 46cm. This measurement also came in handy building the pyramids.
- Sailors used a length of rope between their outstretched arms to measure a fathom or 72 inches or 183cm.
- The height of horses is measured in *"hands."* This is the distance across your joints just above the palm not including the thumb or about 4 inches or 10cm.
- A woman's size 9 foot measures about 10 inches or 25cm long.
- If you have a normal business card it would measure 3.5 inches long by 2 inches wide.
- A standard credit card is 3 3/8 inches by 2 1/8 inches.
- A good ole American dollar bill that is 6 1/6 inches long by 2 7/12 inches tall. Harder to counterfeit? Who comes up with these measurements? Seven twelves of an inch??
- A penny is about ³/₄ of an inch across and a quarter is just slightly less than 1 inch.
- Most common doorways are 6 foot eight inches high.
- The common dining room table is 30 inches high. The chairs are 15-17 inches from the floor.

Unit 6: Unit Rate Conversion (Part 2)	Lesson 6.2

<u>Lesson 6.2 Do Now</u>	Gary eats 20 cookies in 7 minutes. Solve how many seconds it would take Gary to eat 20 cookies, by using what you have learned about converting units.
<u>Homework</u> <u>Reminder</u>	This is where you will shade in the box if you turned in your homework. Homework 6.1 is due today!
Check-In	What was something good that happened yesterday?
	Come up with one nice thing you could do for someone else by the end of the day and write it

below.

Explore Let's look back at a problem from yesterday. 1. Dan estimates that when he is skateboarding he is moving at 15 miles per hour. How many feet per hour is Dan moving? (Hint 1 mile = 5280 feet) a. Which unit is being converted in this problem? b. Look back at your notes from yesterday, how many feet is Dan moving? c. What if the problem read, how many feet does Dan move per minute? a. Which units are being converted in this problem? b. How could we solve using what we know about unit conversion?

Direct Instruction

Today we will be solving unit conversion problems in which both the numerator and the denominator must be converted.

Example #1	1. Start by convertingto
A runner runs 26 miles in 4 hours. Convert this to feet and minutes.	 Next, convertto Your final answer should compareto
$\frac{26 \text{ miles}}{4 \text{ hours}} = \frac{\text{feet?}}{\text{minute?}}$	 Let's look at how to solve below!
Step 1. Convert the numerator	$\frac{26 \text{ miles}}{4 \text{ hours}} \times \frac{5280 \text{ feet}}{1 \text{ mile}} = \frac{137,280 \text{ feet}}{4 \text{ hours}}$
Step 2. Convert the denominator	$\frac{137,280 feet}{4 hours} \times \frac{1 hour}{60 minutes} = \frac{137,280 feet}{240 minutes}$
Step 3. Restate the final answer.	$\frac{26 \text{ miles}}{4 \text{ hours}} = \frac{137,280 \text{ feet}}{240 \text{ minutes}}$

**Keep in mind: When solving unit conversion problems, start by converting the unit in the _____ Example #2 1. Start by converting ______to _____. 2. Next, convert ______to_____. A tortoise moves 588 feet in 50 minutes. Convert this rate to inches and seconds. 3. Your final answer should compare ______ to $\frac{588 \, feet}{50 \, minutes} = \frac{inches?}{second?}$ *Let's look at how to solve below!* $\frac{588 \, feet}{50 \, minutes} \times \frac{inches}{foot} = \frac{inches}{50 \, minutes}$ Step 1. Convert the numerator $\frac{7,056 \text{ inches}}{50 \text{ minutes}} \times \frac{\text{minute}}{60 \text{ seconds}} = \frac{7,056 \text{ inches}}{\text{seconds}}$ Step 2. Convert the denominator $\frac{588 \, feet}{50 \, minutes} = \frac{inches}{second}$ Step 3. Restate the final answer. Joke: How do fish weigh themselves? They stand on their scales. Example #2A What is the difference between Example 2 and Example 2a? A tortoise moves 588 feet in 50 minutes. Convert this rate to inches per 30 seconds. How do you suppose you could solve this problem? $\frac{588 \, feet}{50 \, minutes} = \frac{inches}{30 \, seconds}$ $\frac{3,000}{3,000} = \frac{inches}{1 \ second}$ Step 1. 7,056 inches Use the answer found in Example 3,000 seconds 2 and to solve for the number of inches the tortoise moved in 1 second.

Step 2. Use the ratio found in the last step to solve for the number of inches the tortoise moves in 30 seconds.	$\frac{inches}{1 \ second} \frac{\times \ 30}{\times \ 30} = \frac{inches}{\ 30 \ seconds}$ *Note: Round to the hundredths place
Step 3. Restate the final answer.	The tortoise will move inches in 30 seconds.

You Try!	
Problem #1	1. Start by convertingto
Drew owns a bakery that is famous for selling blueberry muffins. The bakery uses 4 lbs of flour during a 2 hour time period. Use ratios to convert the units into cups per minute.	 Next, convertto Your final answer should compareto
Step 1. Convert the numerator	
Step 2. Convert the denominator	

Step 3. Restate the final answer.	
Problem #2: Part I	1. Start by convertingto
Nicholas runs an 800m in 2 minutes. Convert the information to show how many centimeters Nicholas can run in seconds.	 Next, convertto Your final answer should comparetoto
Ratio:	
Step 1. Convert the numerator	
Step 2. Convert the denominator	

Step 3. Restate the final answer.	
Part II: <u>Nicholas needs to know how</u> <u>many centimeters he can run in</u> <u>10 seconds.</u> Use the information from Step 3 to solve. Hint: *you must first solve the number of centimeters Nicholas runs in 1 second.	

CHALLENGE 😉

Ailah makes a quilt that is 10 ft². It takes her 48 hours to make the quilt. At this rate, how many in² can Ailah quilt in 30 minutes.

Guided Practice

Directions: Answer each of the following question. Use a separate sheet of notebook paper as needed.

1. 12 miles in 3 minutes is how many feet in seconds?	2. 70 yards in 3 days is how many feet in hours?

3. 7 lbs in 50 minutes is how many cups in seconds?	4. 18 feet in 5 days is how many inches in hours?
5. Angie is baking. In a 7 hour time period she uses 18 cups of flour. How many pounds of flour is this?	6. Reagan runs 16 miles in 2 hours. How many feet is this in minutes?
7. Reagan wants to know how many feet she moves in 10 minutes? (Use the answer from the last problem to solve.)	8. Clark scores 18 points in the first 10 minutes of the game. How many points is this per 30 seconds?
9. Henry's snail covers a distance of 5 inches in 30 minutes. How many feet is the snail covering in seconds?	10. Brett uses 8 cups of milk in 3 hours while baking. How many fluid ounces is this in minutes?