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Unit 3, Lesson 6: Interpreting Rates

Let's explore unit rates.

6.1: Something per Something

1. Think of two things you have heard described in terms of "something per something."

2. Share your ideas with your group, and listen to everyone else's idea. Make a group list of all unique ideas. Be prepared to share these with the class.

6.2: Cooking Oatmeal

Priya, Han, Lin, and Diego are all on a camping trip with their families. The first morning, Priya and Han make oatmeal for the group. The instructions for a large batch say, "Bring 15 cups of water to a boil, and then add 6 cups of oats."

- Priya says, "The ratio of the cups of oats to the cups of water is 6 : 15. That's 0.4 cups of oats per cup of water."
- Han says, "The ratio of the cups of water to the cups of oats is 15 : 6. That's 2.5 cups of water per cup of oats."

1. Who is correct? Explain your reasoning. If you get stuck, consider using the table.

water (cups)	oats (cups)
15	6
1	
	1

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2. The next weekend after the camping trip, Lin and Diego each decide to cook a large batch of oatmeal to have breakfasts ready for the whole week.
- a. Lin decides to cook 5 cups of oats. How many cups of water should she boil?
- b. Diego boils 10 cups of water. How many cups of oats should he add into the water?
3. Did you use Priya's rate (0.4 cups of oats per cup of water) or Han's rate (2.5 cups of water per cup of oats) to help you answer each of the previous two questions? Why?

6.3: Cheesecake, Milk, and Raffle Tickets

For each situation, find the **unit rates**.

1. A cheesecake recipe says, "Mix 12 oz of cream cheese with 15 oz of sugar."
- a. How many ounces of cream cheese are there for every ounce of sugar?
- b. How many ounces of sugar is that for every ounce of cream cheese?
2. Mai's family drinks a total of 10 gallons of milk every 6 weeks.
- a. How many gallons of milk does the family drink per week?
- b. How many weeks does it take the family to consume 1 gallon of milk?

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3. Tyler paid \$16 for 4 raffle tickets.

a. What is the price per ticket?

b. How many tickets is that per dollar?

4. For each problem, decide which unit rate from the previous situations you prefer to use. Next, solve the problem, and show your thinking.

a. If Lin wants to make extra cheesecake filling, how much cream cheese will she need to mix with 35 ounces of sugar?

b. How many weeks will it take Mai's family to finish 3 gallons of milk?

c. How much would all 1,000 raffle tickets cost?

Are you ready for more?

Write a "deal" on tickets for Tyler's raffle that sounds good, but is actually a little worse than just buying tickets at the normal price.

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Lesson 6 Summary

Suppose a farm lets us pick 2 pounds of blueberries for 5 dollars. We can say:

blueberries (pounds)	price (dollars)
2	5
1	$\frac{5}{2}$
$\frac{2}{5}$	1

- We get $\frac{2}{5}$ pound of blueberries per dollar.
- The blueberries cost $\frac{5}{2}$ dollars per pound.

The “cost per pound” and the “number of pounds per dollar” are the two *unit rates* for this situation.

A **unit rate** tells us how much of one quantity for 1 of the other quantity. Each of these numbers is useful in the right situation.

If we want to find out how much 8 pounds of blueberries will cost, it helps to know how much 1 pound of blueberries will cost.

blueberries (pounds)	price (dollars)
1	$\frac{5}{2}$
8	$8 \cdot \frac{5}{2}$

If we want to find out how many pounds we can buy for 10 dollars, it helps to know how many pounds we can buy for 1 dollar.

blueberries (pounds)	price (dollars)
$\frac{2}{5}$	1
$10 \cdot \frac{2}{5}$	10

Which unit rate is most useful depends on what question we want to answer, so be ready to find either one!

Lesson 6 Glossary Terms

- unit rate

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1. A pink paint mixture uses 4 cups of white paint for every 3 cups of red paint.

The table shows different quantities of red and white paint for the same shade of pink. Complete the table.

white paint (cups)	red paint (cups)
4	3
	1
1	
	4
5	

2. A farm lets you pick 3 pints of raspberries for \$12.00.

- What is the cost per pint?
- How many pints do you get per dollar?
- At this rate, how many pints can you afford for \$20.00?
- At this rate, how much will 8 pints of raspberries cost?

3. Han and Tyler are following a polenta recipe that uses 5 cups of water for every 2 cups of cornmeal.

- Han says, "I am using 3 cups of water. I will need $1\frac{1}{5}$ cups of cornmeal."
- Tyler says, "I am using 3 cups of cornmeal. I will need $7\frac{1}{2}$ cups of water."

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Do you agree with either of them? Explain your reasoning.

4. A large art project requires enough paint to cover 1,750 square feet. Each gallon of paint can cover 350 square feet. Each square foot requires $\frac{1}{350}$ of a gallon of paint.

Andre thinks he should use the rate $\frac{1}{350}$ gallons of paint per square foot to find how much paint they need. Do you agree with Andre? Explain or show your reasoning.

5. Andre types 208 words in 4 minutes. Noah types 342 words in 6 minutes. Who types faster? Explain your reasoning.

(from Unit 3, Lesson 5)

6. A corn vendor at a farmer's market was selling a bag of 8 ears of corn for \$2.56. Another vendor was selling a bag of 12 for \$4.32. Which bag is the better deal? Explain or show your reasoning.

(from Unit 3, Lesson 5)

7. A soccer field is 100 meters long. What could be its length in yards?

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A. 33.3

B. 91

C. 100

D. 109

(from Unit 3, Lesson 3)