

September 8th

B day



Agenda:

- 1) Bell Ringer: Pick up blue book on table and write name on front cover
- 2) Place homework in basket
- 3) Unit 1: Lesson 1: Measuring Rate
- 4) HW: lesson 1 problems 1-6, challenge 7 (p 4-5)
- 5) Exit Ticket: p. 10

Essential Question: What are we going to learn today?

- 1) How do you calculate unit rate?
- 2) Why are unit rates important or useful?
- 3) How do you make equivalent ratios?

$$\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$$

equal

$$\frac{2}{4} \quad 2:4$$
$$2 \div 4$$

Unit 1: Ratios and Proportions

Lesson 1: An Experience in Relationships as Measuring Rate

Example 1: How fast is our class?

Record the results from the paper passing exercise in the table below.

1 sec

Trial	Number of Papers Passed	Time (in seconds)	Ratio of Number of Papers Passed to Time	Rate	<u>Unit Rate</u>
1	14	17	14 : 17	14/17	.82
2	14	19	14 : 19	14/19	.74 .736
3	14	8	14 : 8	14/8	1.75
4	14	8	14 : 8	14/8	1.75



Key Terms from Grade 6 Ratios and Unit Rates

A ratio is an ordered pair of non-negative numbers, which are not both zero. The ratio is denoted $A:B$ to indicate the order of the numbers: the number A is first and the number B is second.

Two ratios $A:B$ and $C:D$ are equivalent ratios if there is a positive number, c , such that $C = cA$ and $D = cB$.

A ratio of two quantities, such as 5 miles per 2 hours, can be written as another quantity called a rate.

The numerical part of the rate is called the unit rate and is simply the value of the ratio, in this case 2.5. This means that in 1 hour the car travels 2.5 miles. The unit for the rate is miles/hour, read miles per hour.

$$\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$$
$$\frac{1}{2} \quad \frac{1}{2}$$

Example 2: Our Class by Gender

	Number of boys	Number of girls	Ratio of boys to girls
Class 1	6	8	6:8
Class 2	6	11	6:11
Whole 7 th grade	12	19	12:19

Create a pair of equivalent ratios by making a comparison of quantities discussed in this Example.

$$\frac{6}{8} = \frac{3}{4} = \frac{12}{16}$$

Exercise 1: Which is the Better Buy?

Value-Mart is advertising a Back-to-School sale on pencils. A pack of 30 sells for \$7.97, whereas a 12-pack of the same brand cost for \$4.77. Which is the better buy? How do you know?

unit price price ^{each} per pencil
 \div

$$\$ \frac{7.97}{30 \text{ pencils}} = \$0.27 / \text{pencil}$$

$$\$ \frac{4.77}{12 \text{ pencils}} = \$0.40 / \text{pencil}$$

Lesson Summary

Unit Rate is often a useful means for **comparing ratios** and their associated rates when measured in different units. The unit rate allows us to compare varying sizes of quantities by examining the number of units of one quantity per 1 unit of the second quantity. This value of the ratio is the unit rate.

rate unit

- $420/7 = 60 \text{ mph}$
 $360/30 = 12 \text{ customers per day}$

4. Jonathan's parents told him that for every 5 hours of homework or reading he completes, he will be able to play 3 hours of video games. His friend Lucas's parents told their son that he can play 30 minutes for every hour of homework or reading time he completes. If both boys spend the same amount of time on homework and reading this week, which boy gets more time playing video games and how do you know?
5. At Euclid Middle School, of the 30 girls who tried out for the lacrosse team, 12 were selected and of the 40 boys who tried out, 16 were selected. Are the ratios of number of students on the team to number of student trying out the same for both boys and girls? How do you know?

6. Devon is trying to find the unit price on a 6-pack of energy drinks on sale for \$2.99. His sister says that at that price, each energy drink would cost just over \$2.00. Is she correct and how do you know? If she is not, how would Devon's sister find the correct price?
7. Each year Lizzie's school purchases student agenda books, which are sold in the school store. This year, the school purchased 350 books at a cost of \$1,137.50. If the school would like to make a profit of \$1,500 to help pay for field trips and school activities, what is the least amount they can charge for each agenda book? Explain how you found your answer.

Unit Rate Practice

1. Find the unit rate for each situation.
 - a. Making 12 calls in 3 hours
 - b. Reading 312 pages in 4 days
 - c. 560 heartbeats in 6.5 minutes
 - d. Typing 160 words in 4 minutes
 - e. Paying \$284 for a 4 days car rental
 - f. A store that has 15 customers in 20 minutes
 - g. Jogging 22 miles in 2 and $\frac{1}{2}$ hours
 - h. The temperature went up 15 degrees in 4 hours

2. Mike worked 5 days/week and 8 hours/day. He earned \$300/week. What was his hourly rate of pay?

3. An ad claims that 2 gallons of paint will cover 400 square feet. How much paint is needed to cover 600 square feet?

4. Each of your finger nails grows at about .05 cm/week. Each of your toenails grows at about .54 cm/year. Do your toenails or fingernails grow faster?

Show your work for each problem.

- 1) A dozen tomatoes cost \$1.56. What is the cost per tomato?

- 2) A 17-ounce package of spaghetti costs \$4.12. What is the cost per ounce?

- 3) A package of 100 sheets of paper costs \$1.50. What is the price per sheet?

- 4) A car rental company charged \$284 for a 4-day rental. What was the cost per day?

- 5) Mike worked 5 days/week and 8 hours/day. He earned \$300/week. What was his hourly rate of pay?
- 6) If a gallon of milk costs \$3.15, what is the price per quart?
- 7) A 9-ounce bottle of water costs \$1.49. What is the price per ounce?
- 8) Brand A pasta sauce weighs 26 ounces and costs \$4.99. Brand B weighs 32 ounces and costs \$5.79. Which brand is the better buy and by how much?

"Unit Price Project"

Name: _____ date: _____
Mrs. Bennett Math 7

Student Task Sheet

In the ratios and proportions unit we have been studying, you have learned to find unit rates and unit prices. You have also learned to compare unit prices.

In this assignment I am asking you to calculate the unit price of 10 different household items. Display your items on a poster. Next to each item you should include your calculations to find each unit price. Your poster should include a title as well. To go along with your poster you must write a paragraph detailing your findings? Some things you may want to include in your paragraph are which item had the lowest unit price and which item had the highest unit price. You could also compare different brands of the same item. For example, maybe Tide detergent is less expensive per ounce than All detergent. You may want to write about the usefulness of comparing unit prices.

You will be graded on:

Completion:

- Poster with title and 10 objects
- Calculations are included for each item
- Paragraph summarizing findings

Mathematical Concepts:

- Proportions showing all calculations
- Correct mathematical work
- Paragraph correctly compares items

Presentation:

- Title
- Labels
- Proportions are shown
- Paragraph has no spelling or grammatical errors

Timeliness:

- Poster is due 2 weeks from today
- Due date __/ __/ __

