

"I know what we're going to do today."

## Agenda:



- 1) Bell Ringer- page 7- unit price
- 2) Go over homework with your 1:00 buddy
- 3) Unit 3: Ratios and Proportions Lesson 2
  - What is a proportional relationship?
  - a non-proportional relationship?
  - How do these look in tables?
- 4) Unit Price Project- due 9/30 (pages 31-32)
- 5) Homework: Lesson 2 (1-9) on pages 14-16

Sep 15-10:44 PM

### 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.

Nov 12-11:20 AM

**Problem Set**

1. Find each rate and unit rate.
  - a. 420 miles in 7 hours
  - b. 360 customers in 30 days
  - c. 40 meters in 16 seconds
  - d. \$7.96 for 5 pounds

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2. Write three ratios that are equivalent to the one given: 18 right-handed students for every 4 left-handed students.
3. Mr. Rowley has 16 homework papers and 14 exit tickets to return. Ms. Rivera has 64 homework papers and 60 exit tickets to return. For each teacher, write a ratio to represent the number of homework papers to number of exit tickets they have to return. Are the ratios equivalent? Explain.

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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?

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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?

$$\begin{array}{r|l} 6 & 12 \\ \hline 15 & 30 \end{array} \quad \begin{array}{r|l} 16 & 40 \\ \hline 10 & 5 \end{array} \quad \begin{array}{r|l} 4 & 2 \\ \hline 10 & 5 \end{array}$$

$$12 \div 30 = .4$$

$$16 \div 40 = .4$$

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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?

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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

$$\begin{array}{r} 1137.50 \\ + 1500.00 \\ \hline 2637.50 \end{array}$$

$$350 \overline{) 2637.50} \quad \$7.54$$

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**"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.

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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 or division
- 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 \_\_/\_\_/\_\_

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Lesson 2: Proportional and Non-Proportional Relationships in Tables

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Classwork

Example 1: Pay by the Ounce Frozen Yogurt!

price per ounce

A new self-serve frozen yogurt store opened this summer that sells its yogurt at a price based upon the total weight of the yogurt and its toppings in a dish. Each member of Isabelle’s family weighed their dish and this is what they found.

$5 \div 12.5 = .40$     $4 \div 10 = .40$     $2 \div 5 = .40$     $3.20 \div 8 = .40$

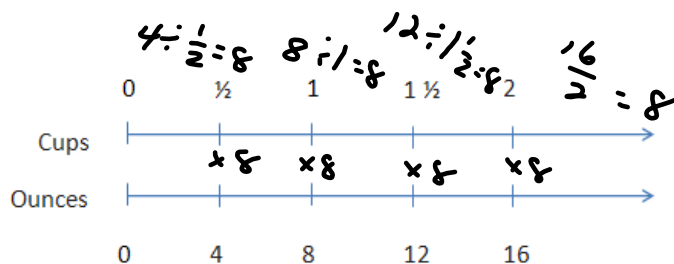
Weight (ounces)	12.5	10	5	8
Cost (\$)	5	4	2	3.20

Cost is proportional to Weight.    $\text{weight} \times .40 = \text{cost}$

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**Example 2: A Cooking Cheat Sheet!**

In the back of a recipe book, a diagram provides easy conversions to use while cooking.



Ounces are proportional to Cups.

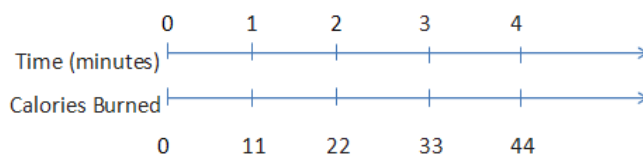
$$\text{cups} \times 8 = \text{ounces}$$

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**Exercise 1**

During Jose's physical education class today, students visited activity stations. Next to each station was a chart depicting how many Calories (on average) would be burned by completing the activity.

Calories burned while Jumping Rope



- a. Is the number of Calories burned proportional to time? How do you know?

yes → because there is a  
constant Rate  
time  $\times 11$  = calories

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- b. If Jose jumped rope for 6.5 minutes, how many calories would he expect to burn?

$$\begin{array}{r} 6.5 \\ \times 11 \\ \hline 71.5 \text{ cal.} \end{array}$$

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### Example 3: Summer Job

Alex spent the summer helping out at his family's business. He was hoping to earn enough money to buy a new \$220 gaming system by the end of the summer. Halfway through the summer, after working for 4 weeks, he had earned \$112. Alex wonders, "If I continue to work and earn money at this rate, will I have enough money to buy the gaming system by the end of the summer?"

To check his assumption, he decided to make a table. He entered his total money earned at the end of week 1 and his total money earned at the end of Week 4.

Week	0	1	2	3	4	5	6	7	8
Total Earnings	0	\$28	56	84	\$112	140	168	196	224

- a. Work with a partner to answer Alex's question.

yes-he has enough

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- b. Are Alex's total earnings proportional to the number of weeks he worked? How do you know?

yes  $\rightarrow$  because there is a  
constant Rate of \$28/week

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### Exercise 2

You have been hired by your neighbors to babysit their children on Friday night. You are paid \$8 per hour. Complete the table relating your pay to the number of hours you worked.

Hours Worked	Pay
1	8
2	16
3	24
4	32
4 $\frac{1}{2}$	36
5	40
6	48
6.5	52

Based on the table above, is pay proportional to hours worked? How do you know?

yes  $\text{hours} \times 8 = \text{pay}$

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## examples 4-6

For Examples 4-6, determine if  $y$  is proportional to  $x$ . Justify your answer.

4. The table below represents the amount of snow fall in 5 counties (in inches) to hours of a recent winter storm.

$x$ Time (hrs)	$y$ Snowfall (in)
2	10
6	12
8	16
2.5	5
7	14

not proportional

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5. The table below shows the relationship between cost of renting a movie to the number of days on rent.

$x$ Number of Days	$y$ Cost
6	2
9	3
24	8
3	1

proportional

$$\begin{aligned} 2 \div 6 &= .\overline{3} \\ 3 \div 9 &= .\overline{3} \\ 8 \div 24 &= .\overline{3} \end{aligned}$$

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6. The table below shows the relationship between the amount of candy (pounds) bought and the total cost.

$x$ Pounds	$y$ Cost
5	10
4	8
6	12
8	16
10	20

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#### Lesson Summary:

Measures in one quantity **are proportional to** measures of a second quantity if there is a **positive number  $k$**  so that for every measure  $x$  of the first quantity, the corresponding quantity  $y$  is given by  $kx$ . The equation  **$y = kx$**  models this relationship.

A **proportional relationship** is one in which the measures of one quantity are proportional to the measures of the second quantity.

One quantity is proportional to a second if a constant (number) exists such that each measure in the first quantity multiplied by this constant gives the corresponding measure in the second quantity.

Steps to determine if two quantities in a table are proportional to each other:

1. For each given measure of Quantity A and Quantity B, find the value of  $\frac{B}{A}$ .

2. If the value of  $\frac{B}{A}$  is the same for each pair of numbers, then the quantities are proportional to each other.

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Problem Set

1. John is filling a bathtub that is 18 inches deep. He notices that it takes two minutes to fill the tub with three inches of water. He estimates it will take ten more minutes for the water to reach the top of the tub if it continues at the same rate. Is he correct? Explain.

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In each table determine if y is proportional to x. Explain why or why not.

2.

x	y
3	12
5	20
2	8
8	32

3.

x	y
3	15
4	17
5	19
6	21

4.

x	y
6	4
9	6
12	8
3	2

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5. Kayla made observations about the selling price of a new brand of coffee that sold in three different sized bags. She recorded those observations in the following table:

Ounces of Coffee	6	8	16
Price in Dollars	\$2.10	\$2.80	\$5.60

Is the price proportional to the amount of coffee? Why or why not?  
Use the relationship to predict the cost of a 20 oz. bag of coffee?

6. You and your friends go to the movies. The cost of admission is \$9.50 per person. Create a table showing the relationship between number of people going to the movies and the total cost of admission.  
Explain why the cost of admission is proportional to the amount of people.

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7. For every 5 pages Gil can read, his daughter can read 3 pages. Let  $g$  equal the number of pages Gil reads and let  $d$  equal the number of pages his daughter reads. Create a table showing the relationship between the number of pages Gil reads and the number of pages his daughter reads.

Is the number of pages Gil’s daughter reads proportional to the number of pages he reads? Explain why or why not.

<u>Gil</u>	<u>daughter</u>
5	3
10	6
15	9

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8. The table shows the relationship between the number of parents in a household and the number of children in the same household. Is the number of children proportional to the number of parents in the household? Explain why or why not.

Number of Parents	Number of Children
0	0
1	3
1	5
2	4
2	1

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9. The table below shows the relationship between the number of cars sold and money earned for a car salesperson. Is the money earned proportional to the number of cars sold? Explain why or why not.

Number of Cars Sold	Money Earned
1	250
2	600
3	950
4	1076
5	1555

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