

Name: _____ Class: _____ Date: _____

Lesson 1: Unit Rates

OBJECTIVE: SWBA to

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units (7.RP.1)

VOCABULARY

A Rate: is a ratio that is used to compare different kinds of quantities.

A Unit rate: is a rate in which the rate is expressed as a quantity of 1. Simply put is rate which has denominator of 1. For example, if a car goes 60 miles in 1 hour, then the unit rate is 60 miles per hour. Other examples are \$5 per Kg, 5 meter per second, and \$96 per barrel

Unit price: The cost per unit, or what you pay for one item. For instance, \$96 per barrel, \$15 per ticket.

Note: Unit price is a type of unit rate, where the unit is dollars

Introduction

Sometimes foods packed in the "giant" or "family" size may seem like the best buy. You may think that buying one large container will not cost as much as two or three smaller packages. But larger containers do not always end up costing you less than smaller ones. It is important to look at the cost per unit and compare this cost. The "**unit price**" tells you the cost per pound, quart, or other unit of weight or volume of a food package. It is usually posted on the shelf below the food. The shelf tag shows the total price (item price) and price per unit (unit price) for the food item.

Foods that cost less per unit are not always the better buy. The big, economy size is not a good buy if you cannot store it properly. If you end up with leftovers that spoil or are thrown out, buying the larger size is not a good idea.

Mini-Lesson (I Do):

Ms. Lembright ordered the types of muffins below for a class party.

- 12 blueberry muffins for \$7.20
- 8 chocolate muffins for \$4.40
- 6 raisin muffins for \$4.50

What type of muffin costs the least?

Show your work.

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Solution:

First we look for the unit price of each muffin.

- 12 blueberry muffins for \$7.20 has a unit price of $\$7.20 \div 12$ which equals to **60 cents** or \$0.60 per blueberry muffin
- 8 chocolate muffins for \$4.40 has a unit price of $\$4.40 \div 8$ which equals about **53 cents** or \$0.53 per chocolate muffins
- 6 raisin muffins for \$4.50 has a unit price of $\$4.50 \div 6$ which equals **75 cents or \$0.75** per raisin muffin

The type of muffin that costs the least is the chocolate muffin at a unit price of 53 cents.

Summarize what you have taught them—Assess for understanding by show of thumbs up/down

Guided Practice (We do):

A 20-ounce bag of popcorn costs \$2.80. If the unit price stays the same, how much does a 35-ounce bag of popcorn cost?

- A \$3.60
- B \$4.00
- C \$4.50
- D \$4.90

Solution:

$\$2.80 \div 20\text{-ounce bag} = 14$ cents or \$0.14 per ounce. So the unit price is 14 cent per ounce. Since the unit price remains the same, if multiply 35 ounces times \$0.14 we get that the 35-ounce bag of popcorn costs $35 \times 0.14 = \$4.90$.

The 35-ounce bag of popcorn cost \$4.90.

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Again, summarize what you have taught them—Assess for understanding by show of thumbs up/down

Independent Practice (You Do):

1. Jeff wants to buy a phone card for long-distance calls. He can buy a 200-minute card for \$10.00 or a 300-minute card for \$12.00. Which card is the better value?

Show your work.

Answer _____

2. A grocery store sign indicates that oranges are 5 for \$3.00. What is the cost of one orange?

Show your work.

Answer: _____

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3. On a bicycle you can travel 20 miles in 4 hours. What is the unit rate in this situation (the distance you can travel in 1 hour and the amount of time required to travel 1 mile)?

Show how you determined your answer

Answer: _____

4. Suppose that a butterfly can fly 82 feet in 4 seconds. A dragonfly can fly 50 feet in 2 seconds. Which can fly faster and by how much?

Show how you determined your answer

Answer: _____

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5. Michelle bought the same fabric on 3 different occasions and recorded the data below.

Yards of Fabric	Total Cost
2.2	\$2.53
3.6	\$4.14
4.2	\$4.83

What was the price per yard of fabric?

Show how you determined your answer

Answer: _____

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6. Ms. Graves gave her class 12 minutes to read. Carrie read $5\frac{1}{2}$ pages in that time.
At what rate, in pages per hour, did Carrie read?

Show how you determined your answer

Answer: _____

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Challenge!

7. Travis was attempting to make muffins to take to a neighbor that had just moved in down the street. The recipe that he was working with required $\frac{3}{4}$ cup of sugar and $\frac{1}{8}$ cup of butter.
- a. Travis accidentally put a whole cup of butter in the mix.
- What is the ratio of sugar to butter in the original recipe? What amount of sugar does Travis need to put into the mix to have the same ratio of sugar to butter that the original recipe calls for?
 - If Travis wants to keep the ratios the same as they are in the original recipe, how will the amounts of all the other ingredients for this new mixture compare to the amounts for a single batch of muffins?
 - The original recipe called for $\frac{3}{8}$ cup of blueberries. What is the ratio of blueberries to butter in the recipe? How many cups of blueberries are needed in the new enlarged mixture?
- b. This got Travis wondering how he could remedy similar mistakes if he were to dump in a single cup of some of the other ingredients. Assume he wants to keep the ratios the same.
- How many cups of sugar are needed if a single cup of blueberries is used in the mix?
 - How many cups of butter are needed if a single cup of sugar is used in the mix?
 - How many cups of blueberries are needed for each cup of sugar?

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Final Summary

In a U-Shape:

1. Re-state the objective to assess if students learn it
2. Elicit from students what they have learned and what they want to learn more about.
3. Tie what they learn to the lesson, and upcoming lessons (Next Saturday, they will learn about proportion, a comparison of two ratios!)