

Unit

6th Grade: Ratios, Rates, Unit Rates, and Percentages

Lesson

A New Bag of Dog Food - Solving Rate Problems

Learning Target

"I can identify the unit rate of a situation and use it to solve problems."

Standards Addressed

- 6.RP.A.2: Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.
- 6.RP.A.3a: Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
- 6.RP.A.3b: Solve unit rate problems including those involving unit pricing and constant speed.

Resources

[Video Clip 1 - "A New Bag of Dog Food"](#) - Setup and questions

[Video Clip 2 - "A New Bag of Dog Food - Info and Solution"](#) - Additional information and solution

Procedure

Part 1

Begin by playing the first video clip. This presents a new bag of dog food being opened, and shows the amount of food given to a dog every day.

Questions to ask:

- How much food does Amelie (the dog) eat in a day?
- How much food does Amelie eat in a week?
- How long will the new bag of dog food last?

Give students time to discuss the questions and decide whether they have enough information to answer the questions yet. They should identify that they need to know how much food is in each cup and how much food is in the new bag. Have students prepare a data sheet to record this information when they see it.

Part 2

Show the second video clip. This shows the amount of food in 1 full measuring cup, given in ounces (the scale reads $5 \frac{5}{8}$ oz). Students then see the dog food bag's total weight (30 pounds). At this point students may realize they need to know how many ounces are in 1 pound (16 oz / lb).

PAUSE THE VIDEO HERE (during the repeat of the 3 questions on screen) and allow students time to perform their calculations and check their work.

Have students answer all 3 questions in their work.

Circulate around the room as students are working. Select 3 or 4 examples of work you think is interesting (which could include some examples of incorrect thinking) and make a note of the order you want to have the class notice them (“select and sequence”).

Sample calculations:

- $(5.625 \text{ oz per cup}) \times (3 \text{ cups per day}) = 16.875 \text{ oz per day}$
- $(16.875 \text{ oz per day}) \times (7 \text{ days per week}) = 118.125 \text{ oz per week, or about 7.38 pounds per week}$
- $30 \text{ lbs} \times (16 \text{ oz per pound}) = 480 \text{ oz in the bag}$
- $480 \text{ oz} \div (16.875 \text{ oz per day}) = 28.44 \text{ days of food}$
- $480 \text{ oz} \div (5.625 \text{ oz per day}) = 85.33 \text{ measuring cups of food total}$

Emphasize that the first question (how much food per day) speaks to the *unit rate* of food, and talk about how the second question (how much food per week) and third question (days per bag of food) use the unit rate in different ways. Also talk about other unit rates that were used in this situation.

After students have reached their conclusions and reviewed the examples as a class, make a list of predictions (these are usually the same in situations like this as all students are using the same data) and write them publicly.

At this point, resume the video for a count of how many cups come out of the bag. The number is actually 80 cups, slightly lower than students might have predicted. This is a good time to have students reflect on possible sources of error. Make a list of things they think might have affected the actual amount of food. Examples might be: The bag didn't contain exactly 30 pounds; the scale didn't measure precisely or accurately enough; or some cups may have been more or less filled than others.