Lesson 16A: From Ratios to Rates

Classwork

Ratios can be transformed to rates and unit rates.

**Example: Introduction to Rates and Unit Rates**

Diet cola was on sale last week; it cost for every packs of diet cola.

* 1. How much do packs of diet cola cost?
  2. How much does pack of diet cola cost?

Exploratory Challenge

* 1. Teagan went to Gamer Realm to buy new video games. Gamer Realm was having a sale: for video games. He bought games for himself and one game for his friend, Diego, but Teagan does not know how much Diego owes him for the one game. What is the unit price of the video games? Don’t forget your units!
  2. Four football fans took turns driving the distance from New York to Oklahoma to see a big game. Each driver set the cruise control during his or her portion of the trip, enabling him or her to travel at a constant speed. The group changed drivers each time they stopped for gas and recorded their driving times and distances in the table below.

|  |  |  |
| --- | --- | --- |
| **Fan** | **Distance (miles)** | **Time (hours)** |
| Andre |  |  |
| Matteo |  |  |
| Janaye |  |  |
| Greyson |  |  |

Use the given data to answer the following questions.

* + 1. What two quantities are being compared?
    2. What is the ratio of the two quantities for each person’s portion of the trip? What is the associated rate? Be sure to include the units.

Andre’s Ratio: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Andre’s Rate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Matteo’s Ratio: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Matteo’s Rate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Janaye’s Ratio: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Janaye’s Rate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Greyson’s Ratio: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Greyson’s Rate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. Which driver would have been them to the game in the shortest time? How do you know? Approximately how long would this trip have taken?
    2. Which driver would have been them to the game in the longest time? How do you know? Approximately how long would this trip have taken?
  1. A publishing company is looking for new employees to type novels that will soon be published. The publishing company wants to find someone who can type at least words per minute on average. Dominique discovered she can type an average of words in minutes. On average, how many words can she type per minute? Does Dominique type at a fast enough rate to qualify for the job? Explain why or why not.
  2. The Marchionda family is doing some home renovations to their Bonus Room. They are comparing the prices for installing carpet and painting for two different contractors. The Bonus Room is 200 square feet, and it will take 3 hours to paint all the walls.

Builders-R-Us charges $2.00 per square foot to install carpet and $25 per hour to paint all the walls.

The Other Guys charge $2.25 per square foot to install carpet and $20 per hour to paint all the walls.

* + 1. How much will each contractor charge for the carpeting?
    2. How much will each contractor charge for the painting?
    3. Which contractor will be the better (cheaper) company to do both renovations?

Lesson Summary

A *rate* is a quantity that describes a ratio relationship between two types of quantities.

For example, miles/hour is a rate that describes a ratio relationship between hours and miles: If an object is traveling at a constant miles/hour, then after hour it has gone miles, after hours it has gone miles, after hours it has gone miles, and so on.

When a rate is written as a measurement, the *unit rate* is the measure (i.e., the numerical part of the measurement). For example, when the rate of speed of an object is written as the measurement miles/hour, the number is the unit rate. The *unit of measurement* is miles/hour, which is read as “miles per hour.”

Name Date

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Exit Ticket

Angela enjoys swimming and often swims at a steady pace to burn calories. At this pace, Angela can swim meters in minutes. How many meters does she swim in one minute? That is, what is her unit rate? Include the units.

* 1. How many meters does she swim in one minute? That is, what is her unit rate? Include the units.
  2. How far will she swim in 35 minutes?
  3. How long will it her to swim 800 meters?

Problem Set

The Scott family is trying to save as much money as possible. One way to cut back on the money they spend is by finding deals while grocery shopping; however, the Scott family needs help determining which stores have the better deals.

1. At Grocery Mart, strawberries cost $ for , and at Baldwin Hills Market strawberries are for
   1. What is the unit price of strawberries at each grocery store? If necessary, round to the nearest penny.
   2. If the Scott family wanted to save money, where should they go to buy strawberries? Why?
2. Potatoes are on sale at both Grocery Mart and Baldwin Hills Market. At Grocery Mart, a bag of potatoes cost and at Baldwin Hills Market a bag of potatoes costs . Which store offers the best deal on potatoes? How do you know? How much better is the deal?
3. Let’s say we want to buy 6 pounds of strawberries and 10 pounds of potatoes. The stores are far apart, so we only want to go to one store. Which store will be the better buy for both the strawberries AND potatoes?