Unit 1- Lesson 6- Rates

Objectives

* Students recognize that they can associate a ratio of two quantities, such as the ratio of miles per hour is 5:2, to another quantity called the rate.
* Given a ratio, students precisely identify the associated rate. They identify the unit rate and the rate unit.
* Given a rate, students find ratios associated with the rate, including a ratio where the second term is one and a ratio where both terms are whole numbers.
* Students recognize that all ratios associated to a given rate are equivalent because they have the same value

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Diet cola was on sale last week; it cost $10 for every 4 packs of diet cola.

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

Teagan went to Gamer Realm to buy new video games. Gamer Realm was having a sale: $\$65$ for $4$ video games. He bought $3$ 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? What is the rate unit?

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 leg of the trip, enabling him to travel at a constant speed. The men 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 | 208 | 4 |
| Matteo | 456 | 8 |
| Janaye | 300 | 6 |
| Greyson | 265 | 5 |

Use the given data to answer the following questions.

What two quantities are being compared?

What is the ratio of the two quantities for Andre’s car? What is the associated rate?

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

Answer the same two questions in part (b) for the other three drivers.

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

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

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

For each driver, circle the unit rate and put a box around the rate unit.

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 45 words per minute. Dominique discovered she can type at a constant rate of $704 $words in $16$ minutes. Does Dominique type at a fast enough rate to qualify for the job? Explain why or why not.

Write each ratio as a rate.

|  |  |
| --- | --- |
| 1. The ratio of miles to hours is $434$ to $7$.
 | 1. The ratio of laps to minutes is $5$ to $4$.
 |

Complete the model below using the ratio from Example 1, part (b).

$\frac{}{}$

$\frac{}{}$ **laps/minute**

**Unit Rate**

**Rate**

**Ratio**

Complete the model below now using the rate listed below.

**Ratio**

**Rate**

**Unit Rate**

**6 ft/sec**

Dave can clean pools at a constant rate of $\frac{3}{5}$ pools/hour.

What is the ratio of pools to hours?

How many pools can Dave clean in 10 hours?

 How long does it take Dave to clean 15 pools?

Emeline can type at a constant rate of $\frac{1}{4}$ pages/minute.

What is the ratio of pages to minutes?

Emeline has to type a 5-page article but only has 18 minutes until she reaches the deadline. Does Emeline have enough time to type the article? Why or why not?

Emeline has to type a 7-page article. How much time will it take her?

Xavier can swim at a constant speed of $\frac{5}{3}$ meters/second.

What is the ratio of meters to seconds?

Xavier is trying to qualify for the National Swim Meet. To qualify, he must complete a 100 meter race in 55 seconds. Will Xavier be able to qualify? Why or why not?

Xavier is also attempting to qualify for the same meet in the 200 meter event. To qualify, Xavier would have to complete the race in 130 seconds. Will Xavier be able to qualify in this race? Why or why not?

The corner store sells apples at a rate of 1.25 dollars per apple.

What is the ratio of dollars to apples?

 Akia is only able to spend $10 on apples. How many apples can she buy?

Christian has $6 in his wallet and wants to spend it on apples. How many apples can Christian buy?

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Classwork/ Partner Practice

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 $2.99 for 2lbs., and at Baldwin Hills Market strawberries are $3.99 for 3 lbs.
	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 $5 lb.$ bag of potatoes cost $\$2.85,$ and at Baldwin Hills Market a $7 lb.$ bag of potatoes costs $\$4.20$. Which store offers the best deal on potatoes? How do you know? How much better is the deal?
3. Once a commercial plane reaches the desired altitude, the pilot often travels at a cruising speed. On average, the cruising speed is 570 miles/hour. If a plane travels at a cruising speed for 7 hours, how far does the plane travel while cruising at this speed?
4. Denver, Colorado often experiences snowstorms resulting in multiple inches of accumulated snow. During the last snow storm, the snow accumulated at $\frac{4}{5}$ inch/hour. If the snow continues at this rate for 10 hours, how much snow will accumulate?

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Exit Ticket/HW

Angela enjoys swimming and often swims at a steady pace to burn calories. At this pace, Angela can swim $1,700$ meters in$ 40$ minutes.

* 1. What is Angela’s unit rate?
	2. What is the rate unit?

Tiffany is filling her daughter’s pool with water from a hose. She can fill the pool at a rate of $\frac{1}{10} $ gallons/second.

Create at least three equivalent ratios that are associated with the rate. Use a double number line to show your work.

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