

## Lesson 17: From Rates to Ratios

### Classwork

Given a rate, you can calculate the unit rate and associated ratios. Recognize that all ratios associated with a given rate are equivalent because they have the same value.

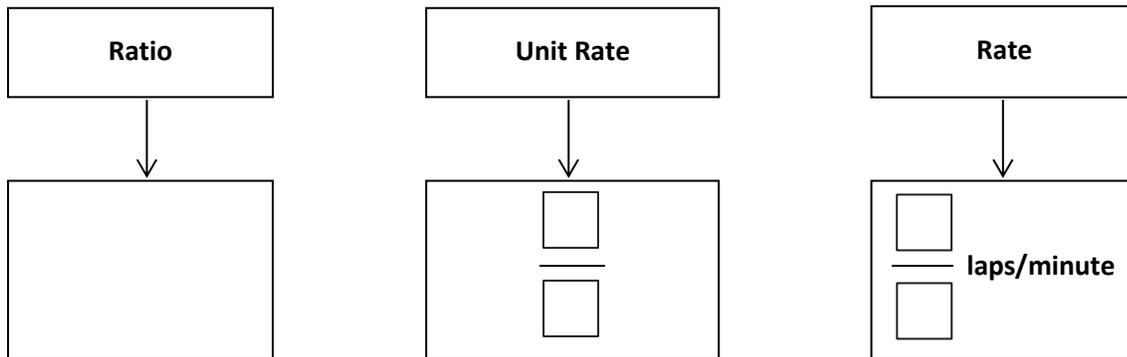
#### Example 1

Write each ratio as a rate.

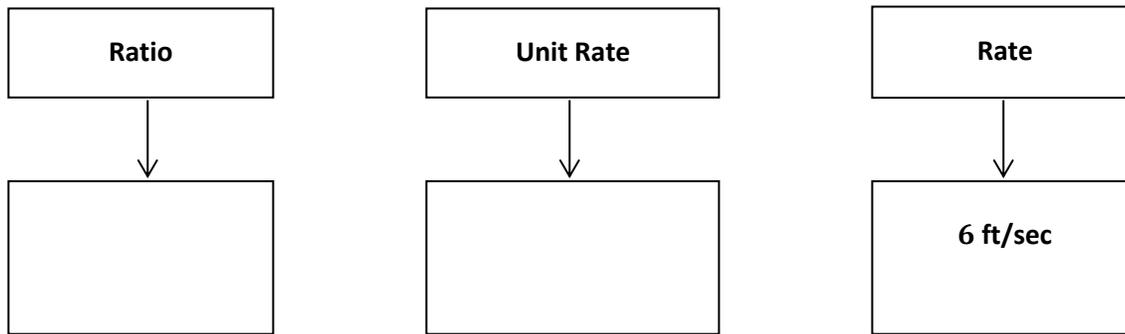
- a. The ratio of miles to the number of hours is 434 to 7.
- b. The ratio of the number of laps to the number of minutes is 5 to 4.

#### Example 2

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



- b. Complete the model below now using the rate listed below.



### Examples 3–6

3. Dave can clean pools at a constant rate of  $\frac{3}{5}$  pools/hour.
- What is the ratio of the number of pools to the number of hours?
  - How many pools can Dave clean in 10 hours?
  - How long does it take Dave to clean 15 pools?

4. Emeline can type at a constant rate of  $\frac{1}{4}$  pages/minute.
- What is the ratio of the number of pages to the number of 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?
5. Xavier can swim at a constant speed of  $\frac{5}{3}$  meters/second.
- What is the ratio of the number of meters to the number of 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?

6. The corner store sells apples at a rate of 1.25 dollars per apple.
- What is the ratio of the amount in dollars to the number of 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?

**Lesson Summary**

A rate of  $\frac{2}{3}$  gal/min corresponds to the unit rate of  $\frac{2}{3}$  and also corresponds to the ratio 2:3.

All ratios associated with a given rate are equivalent because they have the same value.

**Problem Set**

1. 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 this cruising speed for 7 hours, how far does the plane travel while cruising at this speed?
2. 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?