

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.

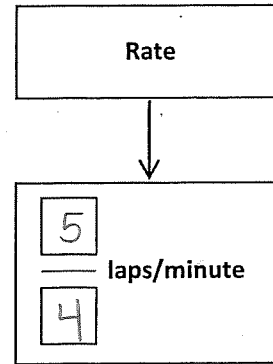
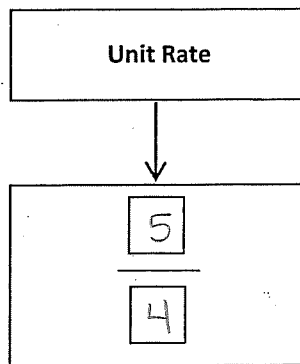
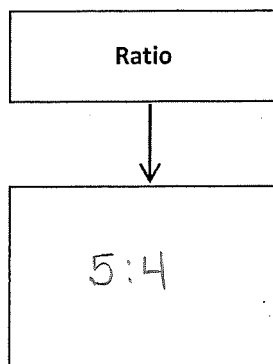
$$\frac{434 \text{ miles}}{7 \text{ hours}} = 62 \text{ mi/hour.}$$

- b. The ratio of the number of laps to the number of minutes is 5 to 4.

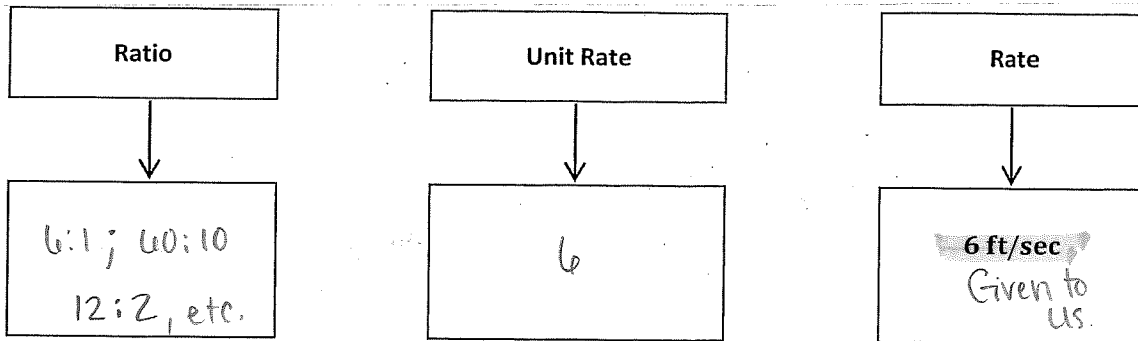
$$\frac{5 \text{ laps}}{4 \text{ min}} = \frac{5}{4} \text{ laps/min.}$$

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

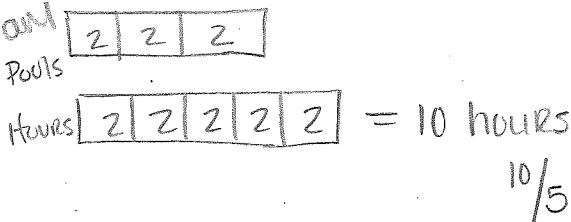
3. Dave can clean pools at a constant rate of $\frac{3}{5}$ pools/hour.

a. What is the ratio of the number of pools to the number of hours?

$3:5$

b. How many pools can Dave clean in 10 hours?

Tape Diagram



of Pools $2 \cdot 3 = 6$ pools.

Table

3	5
6	10

Equation.

$$\frac{3}{5} \cdot \frac{10}{1} = \frac{30}{5} = 6$$

Dave can clean 6 pools in 10 hours.

c. How long does it take Dave to clean 15 pools?



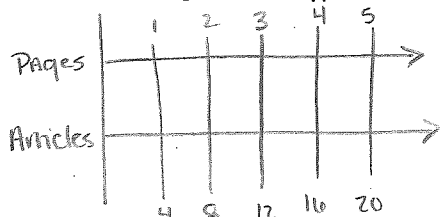
$5 \cdot 5 = 25$

It will take Dave 25 hours to clean 15 pools.

4. Emeline can type at a constant rate of $\frac{1}{4}$ pages/minute.
- a. What is the ratio of the number of pages to the number of minutes?

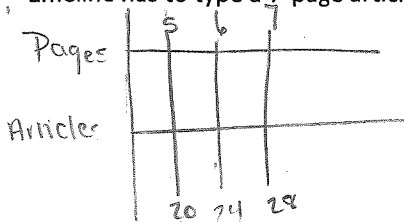
1:4

- b. 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?



No, Emeline will not have enough time b/c it will take her 20 min. to type a 5-page paper.

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



It will take Emeline 28 min to type a 7 page article.

5. Xavier can swim at a constant speed of $\frac{5}{3}$ meters/second.
- a. What is the ratio of the number of meters to the number of seconds?

5:3

- b. 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?

Meters	Seconds
5	3
10	6
100	60

Xavier will not qualify for the meet b/c he would complete the race in 60 seconds.

- c. 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?

Meters	Seconds
100	60
200	120

Xavier will qualify for the meet in the 200-meter race b/c he would complete the race in 120 seconds.

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

$$1.25 : 1$$

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

$$\begin{array}{r} 1.25 \\ \times \quad 8 \\ \hline \end{array}$$

8 Apples.

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

Christian can buy 4 Apples & would spend \$5. Christian can't buy 5 apples b/c it would cost him \$6.25

\$	# of Apples
\$ 1.25	1
\$ 2.50	2
\$ 3.75	3
\$ 5.00	4
\$ 6.25	5