

8th Grade Lesson 63

- I can solve problems using ratios for changing rates.



A rate is a ratio and can be written two ways.

Thirty jars can be filled in one minute

$$\frac{30 \text{ jars}}{1 \text{ min}}$$

$$\frac{1 \text{ min}}{30 \text{ jars}}$$

What are the two new rates if the number of jars per minute are doubled?

$$\frac{60 \text{ jars}}{1 \text{ min}}$$

$$\frac{1 \text{ min}}{60 \text{ jars}}$$

What are the new rates if the original rate is increased by seven jars per minute?

$$\frac{37 \text{ jars}}{1 \text{ min}}$$

$$\frac{1 \text{ min}}{37 \text{ jars}}$$

In everyday usage the word rate means speed, which is the number per unit of time. In this ratio, time is in the denominator.

Prince Charming traveled 60 leagues in 2 days. Then he doubled his rate. How long would it take him to go 300 leagues at this new speed?

$$\frac{60 \text{ leagues}}{2 \text{ days}} = \frac{30 \text{ leagues}}{1 \text{ day}}$$

$$\frac{60 \text{ leagues}}{1 \text{ day}} = \frac{1 \text{ day}}{60 \text{ leagues}}$$

$$300 \text{ leagues} \cdot \frac{1 \text{ day}}{60 \text{ leagues}} = 5 \text{ days}$$

5 days

The machine could cap 500 bottles in 2 hours. If the rate of the machine were tripled, how many bottles could be capped in 10 hours at the new rate?

$$\frac{500 \text{ bottles}}{2 \text{ hrs}} = \frac{250 \text{ bottles}}{1 \text{ hr}}$$

$$\frac{750 \text{ bottles}}{1 \text{ hr}} = \frac{1 \text{ hr}}{750 \text{ bottles}}$$

$$10 \text{ hrs} \cdot \frac{750 \text{ bottles}}{1 \text{ hr}} = 7500 \text{ bottles}$$

Raul ran 6 miles in 2 hours. Then he ran 20 miles in 4 hours. By how much did his rate increase?

$$\frac{6 \text{ mi}}{2 \text{ hr}} = \frac{3 \text{ mi}}{1 \text{ hr}}$$

His rate increased by
2 miles per hour (2 mph)

$$\frac{20 \text{ mi}}{4 \text{ hr}} = \frac{5 \text{ mi}}{1 \text{ hr}}$$

Assignment:

Problem Set 63

Pgs. 201-202 -- Practice A-B, #3-5, 17-19

