

Rates and Unit Rates

A rate is a ratio in which the two terms use different units of measurement.

For example:

2 sandwiches for 5 dollars 150 mi in 3 hr

A unit rate is a rate in which the second term is 1.

For example: 50 mi in 1 hr

This is a unit rate because the units are different for the first and second term, and the second term is 1.

How to write rates as unit rates	How to use unit rates to make comparisons
Give the unit rate for 20 yards in 4 minutes.	Dan painted 9 planks in 6 minutes. Bill painted 22 planks in 11 minutes. Which boy painted at a faster rate?
Example A: Find an equal ratio.	Example B: Find the quotient of the terms.
$\frac{20 \text{ yds}}{4 \text{ min}} = \frac{? \text{ yds}}{1 \text{ min}}$	Rate = $\frac{20 \text{ yds}}{4 \text{ min}}$
$\frac{20 \div 4}{4 \div 4} = \frac{5}{1}$	20 ÷ 4 = 5
Unit Rate: $\frac{5 \text{ yds}}{1 \text{ min}}$	Unit Rate: $\frac{5 \text{ yds}}{1 \text{ min}}$
The unit rate is 5 yards per minute.	Dan's Rate
	Bill's Rate
	$\frac{9 \text{ planks}}{6 \text{ min}}$
	$\frac{22 \text{ planks}}{11 \text{ min}}$
	Unit Rate: $\frac{1.5 \text{ planks}}{1 \text{ min}}$
	Unit Rate: $\frac{2 \text{ planks}}{1 \text{ min}}$
	Bill painted at a faster rate.

Write each as a unit rate.

1. 25 goals in 5 games
2. 48 mi in 8 days
3. 30 books in 15 days
4. 120 oz in 20 min

Which is the faster rate?

5. 3 mi in 12 hr or 8 mi in 18 hr?
6. 32 ft in 45 min or 50 ft in 60 min?
7. **Number Sense** If a car goes 350 mi in 5 hr, what is its rate per hour?

Rates and Unit Rates

Write each as a unit rate.

1. 120 mi to 10 gal of gas

2. 45 pages in 30 min

3. 500 mi in 25 hr

4. \$12.00 for 3 lb

Which is the better buy?

5. 1 lb of apples for \$1.98 or
3 lb for \$6.95

6. 5 lb of flour for \$0.90 or
8 lb for \$1.25

Which is the lower rate?

7. 44 people in 4 theaters or 100 people in 10 theaters

8. 8 cashiers for 96 people or 2 cashiers for 20 people

9. **Number Sense** What makes a unit rate different from other rates?

10. NASA's space shuttle orbits Earth
1 time in 90 minutes. How many times would
the space shuttle orbit Earth in 6 hours?

Test Prep

11. Which is the unit rate for 39 people in 3 vans?

A. 39 people per van

B. 13 vans per person

C. 13 people per van

D. 3 people per van

12. **Writing in Math** Explain how you could convert a rate of miles
per hour to a rate of miles per second.
