



SKILL 3: Rates and Unit Rates

A ratio that compares quantities that have two different units is called a **rate**. A **unit rate** compares a quantity with *one unit* of the other quantity. Two examples of unit rates are \$.25 per ounce ($\frac{\$.25}{1 \text{ oz}}$) and 55 miles per hour ($\frac{55 \text{ mi}}{1 \text{ h}}$).



Example 1

Is the ratio $\frac{700 \text{ words}}{3 \text{ pages}}$ a rate? Is it a unit rate?

The ratio is a rate because the units, words and pages, are different.
It is *not* a unit rate because the comparison is not to 1 page.

Example 2

Find three rates equal to $\frac{\$3}{6 \text{ caramel apples}}$. Find the unit rate.

Make a table of equal ratios.

The unit rate compares the cost in dollars to 1 apple.

		3×2	$3 \div 3$	$3 \div 6$	
Cost in dollars	3	6	1	0.50	
Apples	6	12	2	1	
		6×2	$6 \div 3$	$6 \div 6$	

Three rates equal to $\frac{\$3}{6 \text{ caramel apples}}$ are $\frac{\$6}{12}$, $\frac{\$1}{2}$, and $\frac{\$.50}{1}$.

The unit rate, $\frac{\$.50}{1 \text{ apple}}$, may be written as \$.50 per apple. This is an example of a **unit price** because it shows the price of one unit of the item.

Guided Practice

Is the ratio a rate? Write *yes* or *no* and tell why.

- 5 circles to 2 circles _____
- 365 days per year _____

Is the rate a unit rate? Write *yes* or *no*.

- $\frac{20 \text{ students}}{5 \text{ groups}}$ _____
- $\frac{250 \text{ calories}}{3 \text{ servings}}$ _____
- 25 miles per gallon _____
- $\frac{36 \text{ inches}}{3 \text{ feet}}$ _____
- 12 eggs in a dozen _____
- 8 ounces in a cup _____
- $\frac{\$.90}{1 \text{ h}}$ _____
- \$8.50 for each person _____
- \$85.00 for 10 people _____
- 1 book every 2 weeks _____

SKILL 3: Practice

Is the ratio a rate? Write *yes* or *no*.

1. 5 gallons in 10 minutes _____
2. 3 teaspoons to 1 teaspoon _____
3. 20 quarters in \$5 _____
4. 1 car wash every 15 minutes _____
5. 3 daisies for \$1.00 _____
6. \$20 out of every \$50 _____

Is the rate a unit rate? Write *yes* or *no*. If not, write the rate as a unit rate.

7. 3 weeks per year _____
8. \$4.50 for 2 pounds _____
9. \$10 for 5 books _____
10. 15 minutes for each quarter _____
11. 7.5¢ per ounce _____
12. $\frac{72 \text{ pages}}{6 \text{ days}}$ _____
13. Every 3 days, Miguel has a total of 90 minutes of softball practice. Give three more rates that describe 90 minutes to 3 days. _____

Which vehicle has a mileage rate equal to each of the following? Use the chart for exercises 14 through 17.

14. $\frac{100 \text{ mi}}{5 \text{ gal}}$ _____
15. $\frac{100 \text{ mi}}{4 \text{ gal}}$ _____
16. $\frac{60 \text{ mi}}{4 \text{ gal}}$ _____
17. $\frac{60 \text{ mi}}{2 \text{ gal}}$ _____

Gas Mileage of Passenger Vehicles

Vehicle Type	Gas Mileage
Compact car	30 mi/gal
Mid-sized car	25 mi/gal
Mini-van	20 mi/gal
Sport utility	15 mi/gal



18. Which ratio is a unit rate?

- A 2 mi in 3 h C \$7 to \$1
- B 3 lb for \$2 D 30 mi per h

Skill 3

19. Which ratio is equal to $\frac{24}{36}$?

- F $\frac{36}{24}$ H $\frac{6}{3}$
- G $\frac{3}{2}$ J $\frac{2}{3}$

Skill 2