

Name \_\_\_\_\_

SKILL  
569

## Model Ratios

OBJECTIVE Use a model to write ratios.

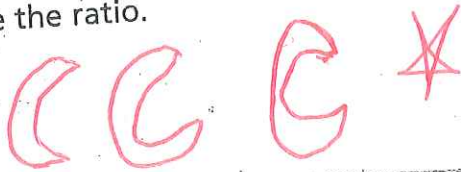
A **ratio** compares two quantities. A ratio can be written with a colon (:) between the two quantities. You can use models and a table to compare quantities and write ratios.

There is 1 star for every 3 moons. Draw a model and write a ratio. Use the ratio to complete a table to compare quantities.

### STEP 1

Draw a model to show the ratio that compares stars to moons.

Write the ratio.



There is 1 star for every 3 moons.

The ratio of stars to moons

1 : 3

### STEP 2

Complete a table to show the ratio of stars to moons.

Think: Each time the number of stars increases by 1 the number of moons increases by 3.

Number of Stars	1	2	3	4
Number of Moons	3	<u>6</u>	<u>9</u>	<u>12</u>

Diagram showing increments: +1 for stars and +3 for moons between consecutive columns.

### Try This!

Write a ratio to compare. Then use the ratio to complete the table.

1. There are 5 berries for every cake.

Ratio of cakes to berries:

1 : 5

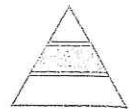
Number of Cakes	1	2	3	4	5
Number of Berries	5	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>

2. There are 10 pencils for every student.

Ratio of students to pencils:

1 : 10

Number of Students	1	2	3	4	5
Number of Pencils	10	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>



## Write Ratios and Rates

OBJECTIVE Write ratios and rates in a variety of ways.

You can compare quantities in several different ways. You can compare one part to another part, one part to the whole, or the whole to one part. You can write the ratio in words, as a fraction, or using a colon. Rates are another way to compare. A rate is a ratio that compares two qualities that have different units of measure.

**A** Richard bought 2 apples, 3 limes and 2 kiwis at the farmer's market. Write the ratio of fruit Richard bought in different ways.

Write ratios in 3 ways.

Compare part to part.  
Limes to kiwis

in words: 3 limes to 2 kiwis

as a fraction:  $\frac{3}{2}$

with a colon: 3 : 2

Compare part to whole.  
Limes to total fruit bought

in words: 3 limes to 7 fruit

as a fraction:  $\frac{3}{7}$

with a colon: 3 : 7

$$\begin{array}{r} 2 \\ 3 \\ + 2 \\ \hline 7 \end{array}$$

**B** A farmer sells apples at the rate of \$2 for a bag of apples. What rate gives the cost of 5 bags of apples?

Think: 1 bag of apples cost \$2, so 2 bags of apples cost \$2 + \$2, or 2 x \$2.

The rate that gives the cost of 5 bags of apples is;

in words: 10 to 5

as a fraction:  $\frac{10}{5}$

with a colon: 10 : 5

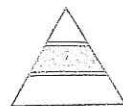
### Try This!

1. There are 3 triangles, 2 circles, and 1 rectangle. Write the ratio of triangles to rectangles in 3 ways.

3 to 1       $\frac{3}{1}$   
3 : 1

2. Trail mix costs \$6 for 1 pound. What rate gives the cost for 4 pounds of trail mix? Write the rate in 3 ways.

24 to 4       $\frac{24}{4}$   
24 : 4



## Find Equivalent Ratios

OBJECTIVE Use a table to find equivalent ratios.

A ratio compares two quantities. **Equivalent ratios** are ratios whose quantities are the same when written in simplest terms. You can use a table to create equivalent ratios.

Use a table to create equivalent ratios for 3:2.

### STEP 1

Write each number from the ratio 3:2 in the first column of the table. Put the first number in the top row and the second number in the bottom row.

### STEP 2

Multiply each number in the ratio by 2. Write the products in the second column of the table.

### STEP 3

Multiply each number in the ratio by 3, 4, and 5. Write the products in the third, fourth, and fifth columns.

		$3 \times 2$ ↓	$3 \times 3$ ↓	$3 \times 4$ ↓	$3 \times 5$ ↓
First Number	3	6	9	12	15
Second Number	2	4	6	8	10
		↑ $2 \times 2$	↑ $2 \times 3$	↑ $2 \times 4$	↑ $2 \times 5$

## Try This!

Complete the table to find equivalent ratios.

1. 3:1

3	6	9	12	15
1	2	3	4	5

3. 2:5

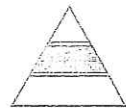
2	4	6	8	10
5	10	15	20	25

2. 4:5

4	8	12	16	20
5	10	15	20	25

4. 1:6

1	2	3	4	5
6	12	18	24	30



## Find Unit Rates

OBJECTIVE Use rates and ratios to determine unit rate.

A **rate** is a **ratio** that compares two units, such as 12 miles in 3 hours (12 miles/3 hours) or \$500 in 2 days (\$500/2). A **unit rate** is a special kind of rate that compares to 1 unit, such as 4 miles per 1 hour or \$250 per 1 day. The denominator in a unit rate is always 1.

A bicycle wheel rotates 360 times in 3 minutes. Find the unit rate.

### STEP 1

Write the rate of the wheel rotations.

The wheel rotated 360 times.

The time was 3 minutes.

The rate is  $\frac{360 \text{ times}}{3 \text{ minutes}}$ .

### STEP 2

Divide the numerator and denominator by the number in the denominator.

$$\frac{360 \text{ rotations}}{3 \text{ minutes}} = \frac{120 \text{ rotations}}{1 \text{ minute}}$$

(Handwritten:  $\div 3$  above 360 and 3, and  $\div 3$  below 3)

### STEP 3

Write the unit rate.

The unit rate is  $\frac{120 \text{ rotations}}{1 \text{ minute}}$ .

## Try This!

Find the unit rate.

1. \$100 in 4 hours

$$\frac{100 \div 4 = 25}{4 \div 4 = 1} \quad \$25 \text{ to } 1 \text{ hour}$$

2. 15 miles in 5 hours

$$\frac{15 \div 5 = 3}{5 \div 5 = 1} \quad 3 \text{ miles in } 1 \text{ hour}$$

3. \$18.64 for 4 pounds

$$\frac{18.64 \div 4 = 4.66}{4 \div 4 = 1} \quad \$4.66 \text{ to } 1 \text{ pound}$$

4. \$6.48 for 12 colored pencils

$$\frac{6.48 \div 12 = 0.54}{12 \div 12 = 1} \quad \$0.54 \text{ for } 1 \text{ pencil}$$

(Handwritten:  $\div 12$  above 6.48 and 12, and  $\div 12$  below 12)