

Ratio Tables Notes - Textbook Pages 40 - 43

Equivalent Ratios

The quantities in the opening activity can be organized into a table. This table is called a **ratio table** because the **columns** are filled with **pairs of numbers** that have the **same ratio**.

| | | | |
|-------|---|---|---|
| Soda | 1 | 2 | 3 |
| Juice | 3 | 6 | 9 |

The ratios $\frac{1}{3}$, $\frac{2}{6}$, and $\frac{3}{9}$ are equivalent, since each simplifies to a ratio of $\frac{1}{3}$.

$$\frac{1}{3}, \frac{2}{6}, \frac{3}{9}$$

Equivalent ratios express the **same relationship** between quantities.

Examples



- To make yellow icing, you mix **6 drops of yellow food coloring** with **1 cup of white icing**. How much yellow food coloring should you mix with **5 cups of white icing** to get the same shade?

Use a ratio table. Since $1 \times 5 = 5$, multiply each quantity by 5.

So, add **30 drops of yellow food coloring** to 5 cups of icing.

| | | |
|-----------------|---|----|
| Drops of Yellow | 6 | 30 |
| Cups of Icing | 1 | 5 |

$$\frac{6 \times 5}{1 \times 5} = \frac{?}{5}$$

Check for Accuracy

To check your answer for Example 2, check to see if the ratio of the two new quantities is equivalent to the ratio of the original quantities.

$$\frac{11}{2} \times \frac{6}{6} = \frac{66}{12}$$

- In a recent year, Joey Chestnut won a hot dog eating contest by eating nearly **66 hot dogs in 12 minutes**. If he ate at a constant rate, determine **about how many hot dogs he ate every 2 minutes**.

Divide each quantity by one or more common factors until you reach a quantity of 2 minutes.

So, Chestnut ate about **11 hot dogs every 2 minutes**.

| | | | |
|------------|----|----|----|
| Hot Dogs | 66 | 33 | 11 |
| Time (min) | 12 | 6 | 2 |

Got It? Do these problems to find out.

- A patient receives **1 liter of IV fluids every 8 hours**. At that rate, find **how many hours** it will take to receive **4 liters of IV fluids**.

| | | |
|---------------|---|----|
| IV Fluids (L) | 1 | 4 |
| Time (h) | 8 | 32 |

- To make cranberry jam, you need **12 cups of sugar** for every **16 cups of cranberries**. Find the **amount of sugar** needed for **4 cups of cranberries**.

| | | | |
|-----------------|----|---|---|
| Sugar (c) | 12 | 6 | 3 |
| Cranberries (c) | 16 | 8 | 4 |

a. 32 h

b. 3 c sugar

Use Scaling

Multiplying or dividing two related quantities by the same number is called **scaling**. Sometimes you may need to **scale back** and then **scale forward** to find an equivalent ratio.

Examples

3. Cans of corn are on sale at 10 for \$4. Find the cost of 15 cans.

| | | | |
|-----------------|----|---|----|
| Cans of Corn | 10 | 5 | 15 |
| Cost in Dollars | 4 | 2 | 6 |

There is no whole number by which you can multiply 10 to get 15. So, scale back to 5 and then scale forward to 15.

| | | | |
|-----------------|----|---|----|
| Cans of Corn | 10 | 5 | 15 |
| Cost in Dollars | 4 | 2 | 6 |

Divide each quantity by a common factor, 2.

Then, since $5 \times 3 = 15$, multiply each quantity by 3.

So, 15 cans of corn would cost \$6.

Find a common factor or a common multiple!

| | | |
|----|----|----|
| 10 | 30 | 15 |
| 4 | 12 | 6 |

4. Joe mows lawns during his summer vacation to earn money. He took 14 hours last week to mow 8 lawns. At this rate, how many lawns could he mow in 49 hours?

Is there a whole number by which you can multiply 14 to get 49? no

Scale back to 7, and then scale forward to 49.

| | | | |
|-----------------|----|---|----|
| Number of Hours | 14 | 7 | 49 |
| Number of Lawns | 8 | 4 | 28 |

So, Joe can mow 28 lawns in 49 hours.

Got It? Do this problem to find out.

- c. A child's height measures 105 centimeters. Estimate her height in inches.

| | | | |
|--------------|----|---|-----|
| Height (cm) | 25 | 5 | 105 |
| Height (in.) | 10 | 2 | 42 |

Show your work.
c. 42 in



Example



5. On her vacation, Leya exchanged \$50 American and received \$60 Canadian. Use a ratio table to find how many Canadian dollars she would receive for \$20 American.

Set up a ratio table. Use scaling to find the desired quantity.

| | | | |
|------------------|----|---|----|
| Canadian Dollars | 60 | 6 | 24 |
| American Dollars | 50 | 5 | 20 |

Divide each quantity by a common factor, 10.

Then, since $5 \times 4 = 20$, multiply each quantity by 4.

Leya would receive \$24 Canadian for \$20 American.

| | | |
|----|----|----|
| 60 | 12 | 24 |
| 50 | 10 | 20 |



Guided Practice

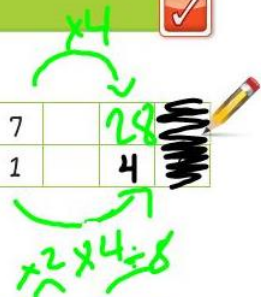


Complete each ratio table to solve each problem.

1. Santiago receives an allowance of \$7 every week. How much total does he receive after 4 weeks? (Example 1)

\$28

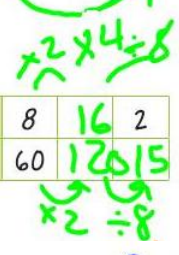
| | | | |
|-----------------|---|--|----|
| Allowance (\$) | 7 | | 28 |
| Number of Weeks | 1 | | 4 |



2. Tonya runs 8 kilometers in 60 minutes. At this rate, how long would it take her to run 2 kilometers? (Example 2)

15 min

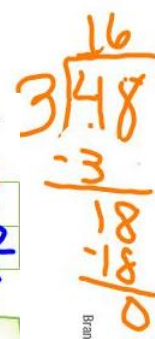
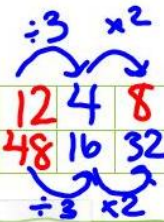
| | | | |
|-------------------|----|-----|----|
| Distance Run (km) | 8 | 16 | 2 |
| Time (min) | 60 | 120 | 15 |



3. Lamika buys 12 packs of juice boxes that are on sale and pays a total of \$48. Use a ratio table to determine how much Lamika will pay to buy 8 more packs of juice boxes at the same store. (Example 5)

\$32

| | | | |
|-----------------------|----|----|----|
| Number of Juice Boxes | 12 | 4 | 8 |
| Price (\$) | 48 | 16 | 32 |



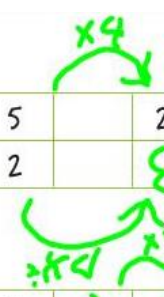
Rate Yourself!

Complete each ratio table to solve each problem.

- 1 To make 5 apple pies, you need about 2 pounds of apples. How many pounds of apples do you need to make 20 apple pies? (Example 1)

8 lbs.

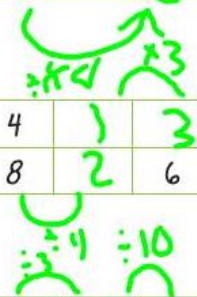
| | | | |
|------------------|---|--|----|
| Number of Pies | 5 | | 20 |
| Pounds of Apples | 2 | | 8 |



2. Four balls of wool will make 8 knitted caps. How many balls of wool will Malcolm need if he wants to make 6 caps? (Examples 3 and 4)

3 balls of wool.

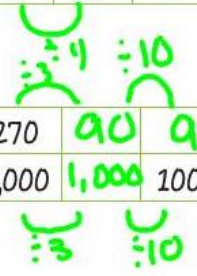
| | | | |
|----------------|---|---|---|
| Balls of Wool | 4 | 1 | 3 |
| Number of Caps | 8 | 2 | 6 |



- 3 Before leaving to visit Mexico, Levant traded 270 American dollars and received 3,000 Mexican pesos. When he returned from Mexico, he had 100 pesos left. How much will he receive when he exchanges these pesos for dollars? (Example 2)

9 dollars

| | | | |
|------------------|-------|-------|-----|
| American Dollars | 270 | 90 | 9 |
| Mexican Pesos | 3,000 | 1,000 | 100 |



4. On a bike trip across the United States, Rodney notes that he covers about 190 miles every 4 days. If he continues at this rate, use a ratio table to determine about how many miles he could bike in 6 days. (Example 5)

285 miles

| | | | |
|-------------|-----|----|-----|
| Miles Biked | 190 | 95 | 285 |
| Days | 4 | 2 | 6 |

