

Accelerated Math Notes
Chapter 5 (Lesson 1-2)

Ratios

The ratio of **girls**
to boys is 5:4

$$\frac{\text{girls}}{\text{boys}} = \frac{5}{4}$$

We read it as five to four

There are 6 black
marbles for every 2 white
marbles. The ratio of
black to white is 3:1

Rates

2000 gallons per hour

65 miles per hour

60 words per minute

2 km/hr

rd

A ratio is a comparison of two quantities by division.
Ratios are always given in simplest form. Order is important.

There are 24 students in Carla's math class. 15 of the students are boys. Find the ratio of girls to boys.

$$\frac{a}{b} \quad \frac{24-15}{15} = \frac{9}{15} = \frac{3}{5} \quad 3 \text{ to } 5 \quad 3:5$$

A soccer team played 15 games. They won 12 games. There were no ties. What is the ratio of games lost to games played?

$$\frac{\text{lost}}{\text{all played}} \quad \frac{15-12}{15} = \frac{3}{15} = \frac{1}{5}$$

When writing a ratio involving measurements, both quantities should have the same unit of measure.

Express the ratio of 21 inches to 2 yards as a ratio in simplest form.

$$\frac{21 \text{ in}}{2 \text{ yd}} = \frac{21 \text{ in}}{2 \cdot 36 \text{ in}}$$

$$= \frac{21}{72} = \frac{7}{24}$$

Express the ratio of 4 kilometers to 4 meters as a ratio in simplest form.

$$\frac{4 \text{ km}}{4 \text{ m}} = \frac{4 \cdot 1000 \text{ m}}{4 \text{ m}}$$

$$= \frac{1000}{1}$$

1000 to 1
1000:1

Simplify these ratios:

2 feet to 18 inches

$$\frac{2 \text{ ft}}{18 \text{ in}} = \frac{2 \cdot 12 \text{ in}}{18 \text{ in}} = \frac{24}{18} = \left(\frac{4}{3}\right)$$

24 centimeters to 6 meters

$$\frac{24 \text{ cm}}{6 \text{ m}} = \frac{24 \text{ cm}}{6 \cdot 100 \text{ cm}} = \frac{24}{600} = \frac{4}{100} = \left(\frac{1}{25}\right)$$

10 inches to 24 inches

$$\frac{10 \text{ in}}{24 \text{ in}} = \left(\frac{5}{12}\right)$$

6 kilometers to 12,000 meters

$$\frac{6 \text{ km}}{12000 \text{ m}} = \frac{6 \cdot 1000 \text{ m}}{12000 \text{ m}} = \frac{6000}{12000} = \left(\frac{1}{2}\right)$$

A **rate** is a ratio that compares two quantities with different kinds of units.

cost per oz

miles per hour

A **unit rate** is a rate that has been simplified so it has a **denominator of 1**.

Example: In 5 minutes, Jen can type 450 words. Find the unit rate.

$$\frac{\text{words}}{\text{min}} \quad \frac{450 \div 5}{5 \div 5} = \frac{90}{1} \quad 90 \text{ words/min}$$

Example: A two pound bag of jolly ranchers cost \$4.79.

Find the cost per pound AND Find the cost per ounce.

$$\frac{\text{cost}}{\text{lb}} = \frac{4.79}{2} = 2.395 \rightarrow \$2.40/\text{lb.}$$

$$\frac{\text{cost}}{\text{oz}} = \frac{4.79}{2 \cdot 16} = \frac{4.79}{32} = 0.1496 = \$0.15/\text{oz}$$

**How much does it cost
to blow your nose??**



Find the best buy based on unit price. Assume tissues are the same size.

Puff's 3-pack \$4.87
(250 tissues per box)
3.250

cost per tissue ~~* Puff~~
 $4.87 \div 250 = 0.00649$
\$0.01/tissue

Kleenex \$1.20
(box of 175 tissues)

$$1.20 \div 175 = 0.00685$$

\$0.01/tissue

Softies \$1.80
Travel 8-packs (15 tissues each)

$$8 \cdot 15 = 120$$

$$1.80 \div 120 = 0.015$$

\$0.02/tissue

Four cans, each 10.5 oz, of Campy's soup cost \$3.29.
 Three cans, each 1 pound, of Healthwise soup costs \$3.99. Find the best buy based on unit price.

Campy's

cost
oz

$$\frac{3.29}{4(10.5)}$$

$$\frac{3.29}{42}$$

X
 Best Buy
 Campy
 $0.0783 \rightarrow \$0.08/\text{oz}$

H

$$\frac{3.99}{3(16\text{oz})}$$

$$\frac{3.99}{48}$$

$$0.0831 \rightarrow \$0.08/\text{oz}$$