

To compare two ratios, you can write both ratios as fractions or as decimals
equivalent ratio- two or more ratios that have the same value

Bird	Wing length (cm)	Average wing width (cm)
White-tailed eagle	209	30
European jay	47	12
Black-headed gull	83	8

use calculator

The ratio comparing the length of a bird's wings to the average width of the bird's wings is the bird's aspect ratio. Order the birds in the table from the greatest aspect ratio to the least
 greatest → least

10.38; 6.97; 3.92

White-tailed eagle:

$$\frac{209}{30} \approx 6.97$$

European jay:

$$\frac{47}{12} \approx 3.92$$

Blackheaded gull:

$$\frac{83}{8} \approx 10.38$$

rates- a ratio of two quantities measured in different units

unit rate- a rate that has a denominator of 1 when expressed in fraction form

expressed as per - "for every"

3. Finding Unit Rate

*divide by denominator to solve

You host a party for 12 people. The food and drinks for the party cost \$66. What is the cost per person?

Cost per person

$$= \frac{66}{12} \div 12 = \frac{5.5}{1} =$$

$$\frac{\$5.50}{1 \text{ person}}$$

w/ units.

~~Answers~~

4. Writing an Equivalent Rate

A jet flies 540 miles per hour. Write its rate in miles per minute.

Conversion:
60 min to 1 hour

*simplify

$$\frac{540 \text{ mi}}{1 \text{ hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} = \frac{9 \text{ mi}}{1 \text{ min}}$$

(1 min)

*simplify

5. Using Equivalent Rates

Engineers designed a miniature robot that can crawl through pipes and vents that humans can't access. The robot travels 1 inch in 3 seconds. How many feet does the robot travel in 4 minutes?

① Robot's rate in inches per min

$$\frac{1 \text{ in}}{3 \text{ sec}} \cdot \frac{20 \text{ sec}}{1 \text{ min}} = \frac{20 \text{ in}}{1 \text{ min}}$$

*multiply by conversion factor

Extra Practice

Write the equivalent rate:

$$\frac{5 \text{ cm}}{1 \text{ min}} = \frac{300 \text{ cm}}{1 \text{ hr}}$$

$$\frac{5 \text{ m}}{1 \text{ sec}} = \frac{18,000 \text{ m}}{1 \text{ hr}}$$

② Find the distance (in feet) the robot can travel in 4 min.

distance = rate x time

$$\frac{20 \text{ in}}{1 \text{ min}} \times 4 \text{ min} = \frac{80 \text{ in}}{1} \times \frac{1 \text{ ft}}{12 \text{ in}} = \frac{80}{12}$$

$$\frac{3 \text{ lb}}{\$1} = \frac{48 \text{ oz}}{\$1}$$

1 lb → 16 oz = 16

$$6\frac{2}{3} \text{ ft}$$

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Pre-Algebra Notes
Week 4: Lesson 6.1

Ratio and Rates

Math Vocab.

1. ratio - use of division to compare two quantities

3 ways to write ratios

$$\frac{a}{b}$$

a to b

$a : b$

- a will always be first stated quantity
- b will always be second stated quantity
- always simplify if possible (don't convert)

Examples

1. Writing Ratios

An archer shoots 60 arrows at a target, with 44 arrows hitting the scoring area and 16 missing the scoring area.

$$\frac{44}{60}$$

Write the ratio in three ways

a. The number of hits to the number of misses

$$\frac{44}{16} \div 4 = \frac{11}{4} ; 11 \text{ to } 4 ; 11:4$$

b. The number of hits to the number of shots

$$\frac{44}{60} \div 4 = \frac{11}{15} ; 11 \text{ to } 15 ; 11:15$$

$$\begin{array}{r} 4 \overline{)15} \\ \underline{12} \\ 30 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

