

# Good Morning!

Today you will need:

Find your new seat!!

- graph spiral
- calculator
- correcting pen
- pencil

Head your graph spiral for **Problem 1.4**

## Skills Check

On your paper, answer the following question:

A can of concentrate grapefruit juice has the instructions "mix 1 can of concentrate with 4 cans of cold water". How many cans of juice will the recipe make, if you use 24 cans of concentrate?

Use equivalent ratios to find the answer, and show the scale factor you used.

Make sure your name, date, and period are on the paper, and put it **face down** at the center of the group.

## Skills Check

$$\frac{1 \text{ can concentrate}}{5 \text{ cans juice}} = \frac{24 \text{ cans concentrate}}{120 \text{ cans juice}}$$

Handwritten notes: A red arrow labeled ".24" points from the top of the first fraction to the top of the second. Another red arrow labeled ".24" points from the bottom of the first fraction to the bottom of the second. The text "120 cans juice" is circled in red below the second fraction.

## 1.4 Keeping Things in Proportion

Scaling to Solve Proportions

In Problem 1.3 you used ratios and scaling to solve problems. When you write two equivalent ratios in fraction form and set them equal to each other, you form a **proportion**.

Otis's strategy for solving a problem involving a ratio of orange concentrate to juice was to write this proportion:

$$\frac{1}{4} = \frac{x}{128}$$

In *Stretching and Shrinking*, you worked with ratios to find missing lengths in similar figures. There are many other situations in which setting up a proportion can help you solve a problem. For example, suppose that among American doctors men outnumber women by a ratio of 12 to 5.

If about 600,000 American doctors are men, how can you figure out how many are women? There are four ways to write this as a proportion.

Write the known ratio of men to women doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{12 \text{ men}}{5 \text{ women}} = \frac{600,000 \text{ men}}{x \text{ women}}$$

Write a ratio of men to men data. Complete the proportion with women to women data.

$$\frac{12 \text{ men}}{600,000 \text{ men}} = \frac{5 \text{ women}}{x \text{ women}}$$

Write the known ratio of women to men doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{5 \text{ women}}{12 \text{ men}} = \frac{x \text{ women}}{600,000 \text{ men}}$$

Write a different ratio of men to men data. Complete the proportion with women to women data.

$$\frac{600,000 \text{ men}}{12 \text{ men}} = \frac{x \text{ women}}{5 \text{ women}}$$

Using what you know about equivalent ratios, you can find the number of women doctors from any one of these proportions. Finding the missing value in a proportion is called *solving the proportion*.

## Writing Proportions

Write the known ratio of men to women doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{12 \text{ men}}{5 \text{ women}} = \frac{600,000 \text{ men}}{x \text{ women}}$$

Write a ratio of men to men data. Complete the proportion with women to women data.

$$\frac{12 \text{ men}}{600,000 \text{ men}} = \frac{5 \text{ women}}{x \text{ women}}$$

Write the known ratio of women to men doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{5 \text{ women}}{12 \text{ men}} = \frac{x \text{ women}}{600,000 \text{ men}}$$

Write a different ratio of men to men data. Complete the proportion with women to women data.

$$\frac{600,000 \text{ men}}{12 \text{ men}} = \frac{x \text{ women}}{5 \text{ women}}$$

Things to remember when writing a proportion...

- 
-

As a team, answer the questions on page 17.  
Record the answers in your graph paper.

For each question, set up a proportion that shows the relationship between known and unknown quantities. Then use equivalent fractions, ratios, and scaling to solve each proportion.

- A** Imani gives vitamins to her dogs. The recommended dosage is 1 teaspoon per day for adult dogs weighing 10 pounds. She needs to give vitamins to Bruiser, who weighs 80 pounds and to Dust Ball, who weighs 7 pounds. What is the correct dosage for each dog?

## Class Work Answers:

- A. Bruiser needs 8 teaspoons of vitamins.

$$\frac{1 \text{ tsp vitamins}}{10 \text{ pound dog}} = \frac{x \text{ tsp vitamins}}{80 \text{ pound dog}}$$

• 8

$$x = 1 \bullet 8 = 8 \text{ tsp vitamins}$$

- Dustball needs 0.7 teaspoon of vitamins.

$$\frac{1 \text{ tsp vitamins}}{10 \text{ pound dog}} = \frac{x \text{ tsp vitamins}}{7 \text{ pound dog}}$$

• 0.7

$$x = 1 \bullet 0.7 = 0.7 \text{ tsp vitamins}$$

## Homework:

## Writing Proportions

Write the known ratio of men to women doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{12 \text{ men}}{5 \text{ women}} = \frac{600,000 \text{ men}}{x \text{ women}}$$

Write a ratio of men to men data. Complete the proportion with women to women data.

$$\frac{12 \text{ men}}{600,000 \text{ men}} = \frac{5 \text{ women}}{x \text{ women}}$$

Write the known ratio of women to men doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{5 \text{ women}}{12 \text{ men}} = \frac{x \text{ women}}{600,000 \text{ men}}$$

Write a different ratio of men to men data. Complete the proportion with women to women data.

$$\frac{600,000 \text{ men}}{12 \text{ men}} = \frac{x \text{ women}}{5 \text{ women}}$$

Things to remember when writing a proportion...

- If the original ratio of information is vertical, the units should match horizontally
- If the original ratio of information is horizontal, the units should match vertically