


## 3.3 Mixing It Up

Connecting Ratios, Rates, Percents, and Proportions

-  You have learned to scale ratios and rates, make percent and rate tables, solve proportions, write equations, and use unit rates. These strategies are related. You can often solve ratio and rate problems in more than one way.



### Problem 3.3

**Chimp Food Recipes**

	<b>Adult Chimps</b> 60% high fiber 40% high protein
	<b>Baby Chimps</b> 40% high fiber 60% high protein



Ming works at the zoo. She mixes food for the baby chimpanzees. Ming mixes up large batches of baby chimp food from sacks of high-fiber food and sacks of high-protein food. She uses the mix information above.

**Problem 3.3** *continued*

- A** 1. Copy and complete the table to find unit rates for the baby chimp mix.

**Baby Chimp Food Mix**

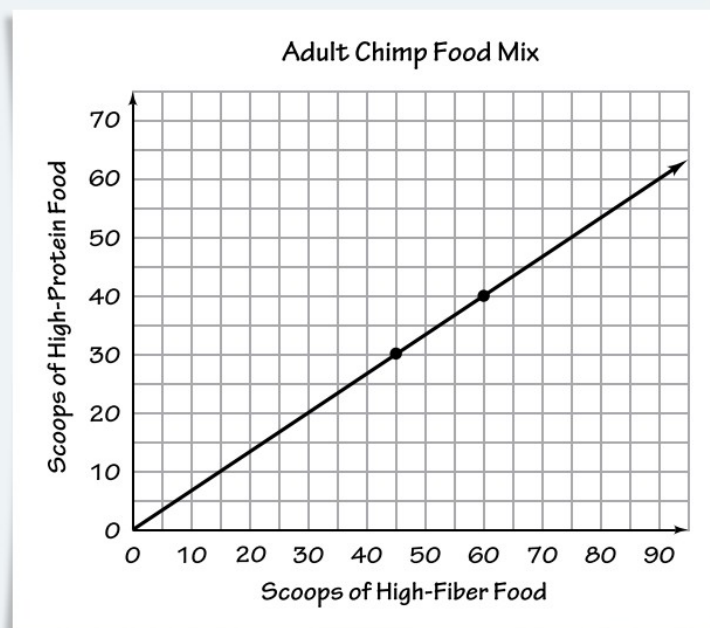
Scoops of High-Fiber Food	■	■	1
Scoops of High-Protein Food	■	1	■
Total Scoops in Mix	100	■	■

2. Write two equations relating the number of scoops of high-fiber food  $F$  and the number of scoops of high-protein food  $P$ .
3. **a.** Ming uses 48 scoops of high-protein food in one batch. How many scoops of high-fiber food does she use? Explain your reasoning.
- b.** Ming mixes a batch of baby chimp food with a total of 125 scoops. How many scoops of high-fiber food does she use? Explain.
- c.** For parts (a) and (b), describe another way to solve each problem.
- B** Some new chimps arrive at the zoo. Ming had already mixed 20 scoops of high-fiber food and 30 scoops of high-protein food. She finds out that the new chimps are adults. Adult chimps need food that has more fiber.
1. Ming needs to add more high-fiber food to the mix she already has. She uses the information on the previous page to adjust the mix. How many more scoops of high-fiber food should she add? Explain.
2. Ming's original mix contained 20 scoops of high-fiber food. By what percentage did the amount of high-fiber food increase when Ming added more high-fiber food to the mix?

*continued on the next page >*

**Problem 3.3** *continued*

- C** Ming graphs the equation  $P = \frac{2}{3}F$  to show the relationship between the amounts of high-protein food and high-fiber food for adult chimps.
- How do you know the graph matches this equation?
  - Explain how Ming can use the graph to answer Question B, part (1).



- D** 1. Ming wants to use a unit rate to find how many more scoops of high-fiber food to add to the adult mix. She writes a proportion.

$$\frac{x \text{ scoops of high fiber}}{30 \text{ scoops of high protein}} = \frac{60\%}{40\%}$$

Ming says that  $\frac{60\%}{40\%}$  is equal to the unit rate 1.5. Is she correct? Explain.

- Ming replaces  $\frac{60\%}{40\%}$  with the unit rate 1.5. Solve  $\frac{x}{30} = 1.5$ .
- What would be Ming's first step in solving  $\frac{x}{4.24} = \frac{6.82}{2.2}$ ?
- Solve the proportion  $\frac{x}{4.24} = \frac{6.82}{2.2}$ . Describe the method you used.

**A C E** Homework starts on page 71.