

## MATH LINK 6: FRACTIONS

**MOTIVATE** Copy this table onto the board:

Games Aired	Basketball	Soccer	Gymnastics
Men's Games	25	12	12
Women's Games	25	9	17
TOTALS	50	21	29

Ask students to think about this problem involving fractions:

*The Sports Network airs many high school and college sporting events during the fall and winter. The table shows the number of games aired, by sport and by gender. The advertising budget will be divided among the sports based on the number of televised events in that sport. You will need to use the information in the table to determine how to spend the \$950,000 budget.*

Let students know that, as a class, you will work out how to solve this problem.

**TEACH AND MODEL** Give a quick review of *fractions*:

- **What is a fraction?** (an equal part of a whole)
- **Which part of the fraction shows how many equal parts the whole is divided into?** (the bottom number, or *denominator*) In  $\frac{4}{5}$ , e.g., the 5 represents the number of equal parts in the whole.
- **Which part of the fraction shows the number of parts being named?** (the top number, or *numerator*) In the example  $\frac{4}{5}$ , the 4 represents the number of parts being named.

To demonstrate this concept, hold up 5 snap cubes, 4 of one color and 1 of another color, snapped together as a rod. Tell students that the 5 cubes together are the whole number—the denominator. The 4 cubes of the same color represent a part of the whole—the numerator.

- **What fraction tells how many parts of the whole cube rod are the cubes of the same color?** ( $\frac{4}{5}$ )  
**What fraction tells how many parts of the whole cube rod is the cube of the second color?** ( $\frac{1}{5}$ )  
**How do you add fractions with the same denominator?** (keep the denominator, add the numerator)  $\frac{4}{5} + \frac{1}{5} = \frac{5}{5} = 1$  whole.

Focus students on the problem. Tell them that they will figure out how to allocate the funds by giving a fraction of the \$950,000 to each sport's advertising budget. The amount will be based on the number of televised events for each sport.

- Explain to students that they must first find the fraction of games aired for each sport compared to the total number of games aired. **What is the total number of games aired?** ( $50 + 21 + 29 = 100$ ) Explain that 100 will be the whole number, or denominator, of the fraction and that the number of games aired for each sport will be the part of the fraction, or the numerator.  
**What is the number of games aired for each sport expressed as a fraction?** ( $\frac{50}{100}, \frac{21}{100}, \frac{29}{100}$ )

Now students must determine how to allocate the advertising funds. Explain that to find the portion of the funds to be spent on advertising during basketball games, they must find  $\frac{50}{100}$  of \$950,000. Tell them that the word "of" often means to multiply, such as when they are told "find  $\frac{1}{2}$  of 100, find 20% of 50, find 0.2 of 40."

- Suggest to students that they first estimate. **How would you estimate  $\frac{50}{100}$  of \$950,000?** (Sample response:  $\frac{50}{100}$  of \$950,000 is a little less than  $\frac{50}{100}$  of \$1,000,000:  $\frac{50}{100} \times 1,000,000$   
 $\frac{50}{100} \times 1,000,000$   
 $50 \times 10,000 = 500,000$   
 \$500,000 is a reasonable estimate.)

- On the board, write the multiplication sentence  $\frac{50}{100} \times \frac{950000}{1}$ . Point out that 950,000 written as a fraction is  $\frac{950000}{1}$ . Model the multiplication for students, reducing the fractions as shown:

$$\frac{50}{100} \times \frac{950000}{1} = \frac{50 \times 950000}{100} = \frac{50 \times 9500}{1} = \frac{475000}{1} = \$475,000$$

- Have students compare the calculated answer to the estimate they made earlier. **Was your estimate reasonable?** (Yes, the estimate of \$500,000 is a little more than \$475,000.)
- Have students use the multiplication on the board as a model to find the amount of money allocated to soccer (\$199,500) and gymnastics (\$275,500). Then have students check their math by adding the amounts to see if they total \$950,000. ( $\$475,000 + \$199,500 + \$275,500 = \$950,000$ )

Explain to students that the advertising department wants to know what fractions of the budget will be spent on men's and women's sports. Refer students to the table on the board.

- **How many of the total number of sports events are women's sports?** ( $25 + 9 + 17 = 51$ ) **What fraction represents women's events?** ( $\frac{51}{100}$ )
- **How many of the total number of sports events are men's sports?** ( $25 + 12 + 12 = 49$ ) **What fraction represents men's events?** ( $\frac{49}{100}$ )

Ask students to compare the fractions and then estimate how much will be spent in each area. Since a bit more than half the sports events are women's, a bit more than half the money should be for women's events. Have students keep this in mind when making their estimates.

Have students use what they have learned to determine the fractions of the budget to be spent on men's and women's sports. Guide them through the multiplication process. Point out that they can reduce the fractions by dividing 950,000 and 100 by 100.

$$\frac{51}{100} \times \frac{950000}{1} = \frac{51 \times 950000}{100} = \$484,500 \qquad \frac{49}{100} \times \frac{950000}{1} = \frac{49 \times 950000}{1} = \$465,500$$



**PRACTICE AND APPLY** Have students complete Math Link 6: **A Fraction of the Budget**.

As they work, copy the following problems onto the board for all students to complete independently. Then invite them to play the corresponding **Matchmaker** game.

$$\frac{1}{8} \text{ of } 72 = (9)$$

$$\frac{3}{5} \text{ of } 65 = (39)$$

$$\frac{3}{5} \times \frac{2}{3} = (\frac{6}{15} = \frac{2}{5})$$

$$\frac{2}{7} \times \frac{3}{6} = (\frac{6}{42} = \frac{1}{7})$$

## MATH LINK 6: A FRACTION OF THE BUDGET

**Calculate the Answer** The advertising department has decided to allocate the \$199,500 soccer advertising budget according to the number of men’s games and women’s games.

12 men’s games will be shown this season.  
9 women’s games will be shown this season.

You want to know the amount of money to spend on men’s soccer and on women’s soccer. Use the table to help you calculate the answers. The calculations for men’s soccer have been started for you.

	Men’s Soccer	Women’s Soccer
Write a fraction and reduce it if possible.	$\frac{12}{21} = \frac{4}{7}$	$\frac{9}{21} = \frac{3}{7}$
Write a multiplication problem.	$\frac{4}{7} \times 199,500$	$\frac{3}{7} \times 199,500$
Multiply and divide to remove the fraction.	$\frac{(4 \times 199,500)}{7} = 114,000$	$\frac{(3 \times 199,500)}{7} = 85,500$
Add the amounts to check your work.	$\$114,000 + \$85,500 = \$199,500$	

How much of the advertising budget should be spent on men’s soccer? \$114,000  
On women’s soccer? \$85,500

**Balance Beams and Budgets**  $\frac{1}{3}$  of the men’s 12 gymnastics meets will be aired at night. The advertising dept. has decided that half of the \$275,500 gymnastics budget should go to these meets. If the money is divided evenly between the meets, how much will each meet get?

Show your work here:

$$\frac{1}{2} \times \frac{275,500}{1} = \frac{275,500}{2} = \$137,750$$

$$\frac{1}{3} \times \frac{12}{1} = \frac{12}{3} = 4 \text{ night meets}$$

$$\begin{array}{r} 34437.50 \\ 4 \overline{) 137750.00} \end{array}$$

First, find the amount of the budget that should go to the men’s night meets. \$137,750

Next, find the number of men’s meets that will be aired at night. 4 How will you find the amount of money that should be spent on advertising for each meet?  $\$137,750 \div 4$

How much money should be spent on advertising for each men’s night meet? \$34,437.50

**In your Math Journal, write a simple problem where you multiply fractions. Then, list the steps you would need to take to solve the problem.**