

## MATH LINK 16: BAR GRAPHS AND MEAN

**MOTIVATE** Ask students to think about this problem involving data displayed in a bar graph:

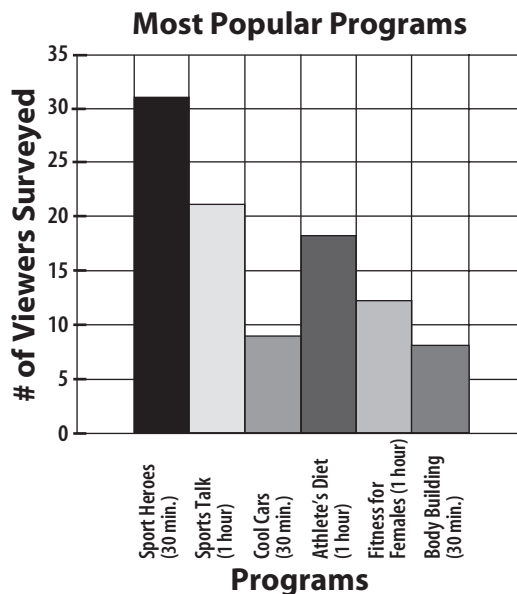
*In an effort to reorganize TSN's program lineup for Saturdays, you surveyed some viewers to determine their favorite shows. Based on the data you got, you will decide which shows to air during the prime-time hours, from 8:00 PM to 11:00 PM on Saturdays. You will use the graph to help you make your decisions.*

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

**TEACH AND MODEL** Copy the bar graph to the right onto the board. Review the parts of a *bar graph* with students. Point out the *x*-axis (Programs), *y*-axis (# of Viewers Surveyed), the interval (5), labels, and title (Most Popular Programs).

Now have students use the bar graph to answer these questions:

- **Which program was the most popular? (Sports Heroes)**  
*How many people chose Sports Heroes?* (31) Ask students to explain how they could tell from the graph that *Sports Heroes* was the most popular show.
- **Which program was the least popular? (Body Building)**
- **Which were the second- and third-most popular? (Sports Talk and Athlete's Diet)**
- **If you chose to air the three most popular programs, would you have too many, too few, or the perfect number of programming hours for prime time?** (too few—we need 3 hours and these programs combined are only  $2\frac{1}{2}$  hours)
- **Is there any way to tell from the graph whether surveyed viewers were male or female?** (No)  
*Do you think the gender of the person voting might affect their vote?* (Yes) *Why or why not?* (Males and females often like different types of shows.) *How might you change your survey to identify shows that appeal to both sexes?* (separate men's votes from women's votes)
- At this point, ask students to make a decision about which programs to air to fill the 3 prime-time hours. Have volunteers explain how they made their decisions.
- Inform students that next Saturday night, The Sports Network will air a 1-hour special on the local high school girls' basketball championship. As a result, you can run only 2 hours of regular programming. **What should you air now?** (In order to fill 2 hours, students must choose between airing the two most popular shows, *Sports Heroes* and *Sports Talk*, along with the fifth-most popular show, *Cool Cars*, or airing the second- and third-most popular shows, *Sports Talk* and *Athlete's Diet*.) **Explain your decision.** (Answers will vary, but should support the programming decision.)



Read this next scenario to students:

*You've noticed that in the program Sports Talk, each highlight of game action is a different length. Even though it would mean extending some highlights and shortening others, you'd like to experiment by standardizing the time frame of each game highlight. You begin by reviewing the game highlights from last Saturday's show.*

Copy the table below onto the board. It shows the length of each game highlight in last Saturday's *Sports Talk* program.

Game Highlight	1	2	3	4	5	6	7	8	9
Time (seconds)	70	65	43	62	37	52	66	37	54

- **Finding the mean of the game highlights will help you determine how long each new highlight should be.**
  - **What is the mean?** (the average of the numbers in a set of data)
  - **How will you find the mean in this case?** (add the number of seconds of each game highlight and divide the sum by the total number of highlights)
- Have students first estimate the mean. Suggest that they look at the highest and lowest numbers and then look at the number in the middle to decide on an estimate. Then ask students to calculate the actual mean.
  - **What is the total number of seconds of game highlights?** (486)
  - **How many highlights are there?** (9)
  - **What is 486 divided by 9?** (54) **What does 54 stand for?** (The mean length of a game highlight is 54 seconds. A standard game highlight should be 54 seconds long.)



### **PRACTICE AND APPLY**

Have students complete Math Link 16: **Raise the Mean**. As they work, copy the following problems onto the board for all students to complete independently. Then invite them to play the corresponding **Close Call** game.

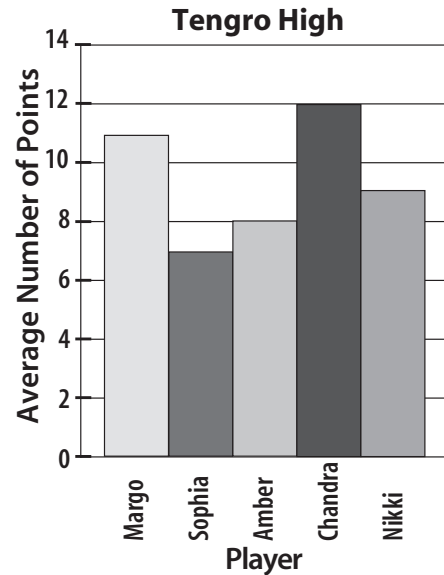
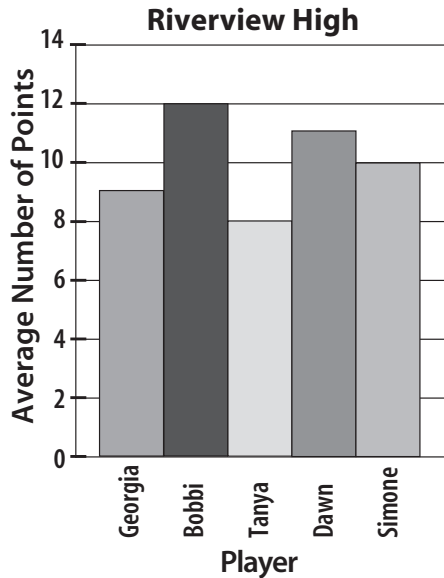
Find the mean of each of the following sets of data:

34, 53, 45, 23, 23, 89 (44.5)

103, 189, 92, 80, 121 (117)

## MATH LINK 16: RAISE THE MEAN

**Top Five Stats** This Saturday night, The Sports Network will air the local high school girls' basketball championship. The graphs below show the average points per game scored this season by the top five scorers on each team.



Your task is to determine the mean, or average, number of points scored by the top five scorers on each team.

To calculate the mean, remember that you add the number of points scored by each player and then divide by the total number of players on each team.

Show your work here:

$$\text{Riverview High: } 9 + 12 + 8 + 11 + 10 = 50$$

$$50 \div 5 = 10$$

$$\text{Tengro High: } 11 + 7 + 8 + 12 + 9 = 47$$

$$47 \div 5 = 9.4$$

Suppose that Bobbi of Riverview High had raised her personal average by 2 points. How would this new statistic change the mean for Riverview players?

Show your work here:

$$50 + 2 = 52 \div 5 = 10.4$$

By how many points would Riverview's mean be raised? 0.4

What would be the new mean for the Riverview players? 10.4

According to the results you found, who had the higher mean before the championship game? Riverview High

**In your Math Journal, explain how you found the new mean for Riverview. Then tell how the mean would've changed if the top two scorers had each increased their average by 2 points.**