

# Applications

5-2

*Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.*

H.G. Wells, English Science Fiction Author

1. Interpret the quote in the context of what you learned. See margin.
2. Find the mean, median, mode, and range for each data set given.
  - a. 7, 12, 1, 7, 6, 5, 11 mean = 7; median = 7; mode = 7; range = 11
  - b. 85, 105, 95, 90, 115 mean = 98; median = 95; no mode; range = 30
  - c. 10, 14, 16, 16, 8, 9, 11, 12, 3 mean = 11; median = 11; mode = 16; range = 13
  - d. 10, 8, 7, 5, 9, 10, 7 mean = 8; median = 8; mode = 7 and 10; range = 5
  - e. 45, 50, 40, 35, 75 mean = 49; median = 45; no mode; range = 40
  - f. 15, 11, 11, 16, 16, 9 mean = 13; median = 13; mode = 11 and 16; range = 7

3. Which of the data sets from Exercise 2 are skewed? b and e
4. Courtney wants to sell her grandfather's antique 1932 Ford. She begins to set her price by looking at ads and finds these prices: \$24,600, \$19,000, \$33,000, \$15,000, and 20,000. What is the mean price? \$22,320

5. Five Smithtown High School students are saving up to buy their first cars. They all have after-school jobs, and their weekly salaries are listed in the table.

Emily	\$110
Sam	\$145
Danielle	\$130
Katie	\$160
Stephanie	\$400

- a. What is the mean weekly salary for these students? \$189
  - b. What is the median salary? \$145
  - c. Whose salary would you consider to be an outlier? Stephanie's
  - d. Which number do you think is better representative of the data, the mean or the median? median
  - e. Explain your answer to part d. Because there is an outlier, the median is better representative than the mean.
6. Rosanne is selling her Corvette. She wants to include a photo of her car in the ad. Three publications give her prices for her ad with the photograph:

Lake Success Shopsaver	\$59.00
Glen Head Buyer	\$71.00
Floral Park Moneysaver	\$50.00

- a. What is the mean price of these ads? Round to the nearest cent. \$60.00
  - b. What would it cost her to run all three ads? \$180
  - c. If each of the three newspapers used the mean price as their ad price, what would it cost Rosanne to run ads in all three papers? \$180
  - d. Find the range of these ad prices. \$21
7. Dan's parents are going to pay for half of his car if he gets a 90 average in math for all four marking periods and the final exam. Here are his grades for the first four quarters: 91, 82, 90, and 89. What grade does he need on his final exam to have a 90 average? 98

## TEACH

### Exercise 5

When discussing their responses in class, try to get students to use the words *skew* and *resistant* so you can verify that they understand them.

### Exercise 7

Students are frequently trying to figure out what they need on the next test to get a certain grade. Remind them that they have added another grade and should make sure they are dividing by the correct number.

## ANSWERS

1. With the tremendous crunching and availability of data due to the prevalence of technology, we are bombarded by statistics on a daily basis. Understanding how to interpret this information is becoming increasingly important.

## TEACH

### Exercise 8

Remind students about the credit chapter they recently completed. If someone has to save years for a car, what would they drive while they are saving?

### Exercises 14–18

Students can create their lists and trade with other students. Then have them perform the required computations to see if their numbers satisfy the problems posed.

8. Elliot is saving to buy a used car next year on his 18th birthday. He plans on spending \$6,000. How much must he save each week, if he plans to work the entire year with only two weeks off? **\$120**
9. The mean of five numbers is 16. If four of the numbers are 13, 20, 11 and 21, what is the fifth number? **15**
10. The quartiles of a data set are  $Q_1 = 50$ ,  $Q_2 = 72$ ,  $Q_3 = 110$ , and  $Q_4 = 140$ . Find the interquartile range. **60**
11. The following list of prices is for a used original radio for a 1955 Thunderbird. The prices vary depending on the condition of the radio.  
\$210, \$210, \$320, \$200, \$300, \$10, \$340,  
\$300, \$245, \$325, \$700, \$250, \$240, \$200
  - a. Find the mean of the radio prices. **\$275**
  - b. Find the median of the radio prices. **\$247.50**
  - c. Find the mode of the radio prices. **\$200, \$210, and \$300**
  - d. Find the four quartiles.  **$Q_1 = 210$ ,  $Q_2 = 247.50$ ,  $Q_3 = 320$ ,  $Q_4 = 700$**
  - e. Find the interquartile range for this data set. **110**
  - f. Find the boundary for the lower outliers. Are there any lower outliers? **\$45; yes, there is one lower outlier, \$10.**
  - g. Find the boundary for the upper outliers. Are there any upper outliers? **\$485; yes, there is one upper outlier, \$700.**
12. Bill is looking for original taillights for his 1932 Ford. The prices vary depending on the condition. He finds these prices:  
\$450, \$100, \$180, \$600, \$300, \$350, \$300, and \$400.
  - a. Find the four quartiles.  **$Q_1 = 240$ ;  $Q_2 = 325$ ;  $Q_3 = 425$ ;  $Q_4 = 600$**
  - b. Find the interquartile range. **185**
  - c. Find the boundary for the lower outliers. Are there any lower outliers? **-\$37.50; there are no lower outliers.**
  - d. Find the boundary for the upper outliers. Are there any upper outliers? **\$702.50; there are no upper outliers.**
13. Eliza wants to sell a used car stereo online. From her research on the website she will post to, she found 8 similar stereos listed. She decides to list her stereo for 20% less than the mean price of the stereos already for sale on the site. Let  $x$  represent the sum of the prices of the stereos she found in her research. Write an expression to calculate the price she will list as the cost of her stereo.  **$\frac{x}{8} - 0.2\left(\frac{x}{8}\right)$  or  $0.8\left(\frac{x}{8}\right)$**
14. Create a list of five different numbers whose mean is 50. **Answers vary.**
15. Create a list of six different numbers whose median is 10. **Answers vary.**
16. Create a list of five numbers whose mean and median are both 12. **Answers vary.**
17. Create a list of numbers whose mean, median, and mode are all 10. **Answers vary.**
18. Create a list of numbers with two upper outliers and one lower outlier. **Answers vary.**
19. Explain why you cannot find the range of a data set if you are given the four quartiles. **You need the least number, which is not one of the quartiles.**