

7.4 Choosing a Data Display

Essential Question How can you display data in a way that helps you make decisions?



1 ACTIVITY: Displaying Data

Work with a partner. Analyze and display each data set in a way that best describes the data. Explain your choice of display.

- a. **ROAD KILL** A group of schools in New England participated in a 2-month study and reported 3962 dead animals.

Birds 307	Mammals 2746
Amphibians 145	Reptiles 75
Unknown 689	



- b. **BLACK BEAR ROAD KILL** The data below show the number of black bears killed on Florida roads from 1987 to 2006.

1987	30	1994	47	2001	99
1988	37	1995	49	2002	129
1989	46	1996	61	2003	111
1990	33	1997	74	2004	127
1991	43	1998	88	2005	141
1992	35	1999	82	2006	135
1993	43	2000	109		

- c. **RACCOON ROAD KILL** A 1-week study along a 4-mile section of road found the following weights (in pounds) of raccoons that had been killed by vehicles.

13.4	14.8	17.0	12.9
21.3	21.5	16.8	14.8
15.2	18.7	18.6	17.2
18.5	9.4	19.4	15.7
14.5	9.5	25.4	21.5
17.3	19.1	11.0	12.4
20.4	13.6	17.5	18.5
21.5	14.0	13.9	19.0



- d. What do you think can be done to minimize the number of animals killed by vehicles?

2 ACTIVITY: Statistics Project

ENDANGERED SPECIES PROJECT Use the Internet or some other reference to write a report about an animal species that is (or has been) endangered. Include graphical displays of the data you have gathered.

Sample: Florida Key Deer

In 1939, Florida banned the hunting of Key deer. The numbers of Key deer fell to about 100 in the 1940s.

In 1947, public sentiment was stirred by 11-year-old Glenn Allen from Miami. Allen organized Boy Scouts and others in a letter-writing campaign that led to the establishment of the National Key Deer Refuge in 1957. The approximately 8600-acre refuge includes 2280 acres of designated wilderness.

Key Deer Refuge has increased the population of Key deer. A recent study estimated the total Key deer population to be between 700 and 800.



About half of Key deer deaths are due to vehicles.



One of two Key deer wildlife underpasses on Big Pine Key

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you display data in a way that helps you make decisions? Use the Internet or some other reference to find examples of the following types of data displays.

- Bar graph
- Circle graph
- Scatter plot
- Stem-and-leaf plot
- Box-and-whisker plot

Practice

Use what you learned about choosing data displays to complete Exercise 3 on page 300.

Key Idea

Data Display

Pictograph

What does it do?

shows data using pictures



Bar Graph

shows data in specific categories



Circle Graph

shows data as parts of a whole



Line Graph

shows how data change over time



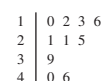
Histogram

shows frequencies of data values in intervals of the same size



Stem-and-Leaf Plot

orders numerical data and shows how they are distributed



Box-and-Whisker Plot

shows the variability of a data set using quartiles



Line Plot

shows the number of times each value occurs in a data set



Scatter Plot

shows the relationship between two data sets using ordered pairs in a coordinate plane



EXAMPLE 1 Choosing an Appropriate Data Display

Choose an appropriate data display for the situation. Explain your reasoning.

- the number of students in a marching band each year
 A line graph shows change over time. So, a line graph is an appropriate data display.
- comparison of people's shoe sizes and their heights
 You want to compare two different data sets. So, a scatter plot is an appropriate data display.

On Your Own

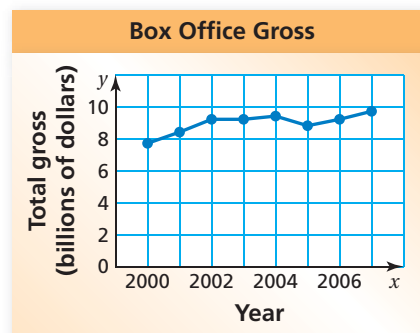
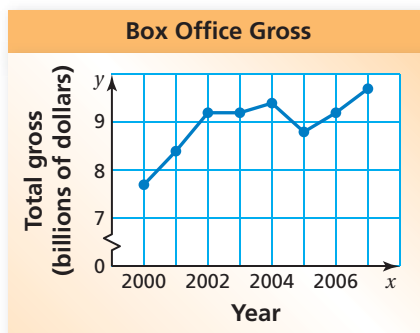
Choose an appropriate data display for the situation. Explain your reasoning.

- the population of the United States divided into age groups
- the percents of students in your school who speak Spanish, French, or Haitian Creole

Now You're Ready
Exercises 4–7

EXAMPLE 2 Identifying a Misleading Data Display

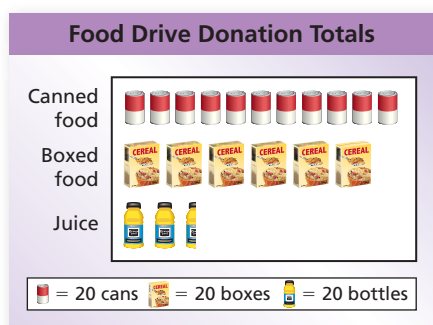
Which line graph is misleading? Explain.



The vertical axis of the line graph on the left has a break (↗) and begins at 7. This graph makes it appear that the total gross increased rapidly from 2000 to 2004. The graph on the right has an unbroken axis. It is more honest and shows that the total gross increased slowly.

So, the graph on the left is misleading.

EXAMPLE 3 Analyzing a Misleading Data Display



A volunteer concludes that the number of cans of food and boxes of food donated were about the same. Is this conclusion accurate? Explain.

Each icon represents the same number of items. Because the box icon is larger than the can icon, it looks like the number of boxes is about the same as the number of cans, but the number of boxes is actually about half of the number of cans.

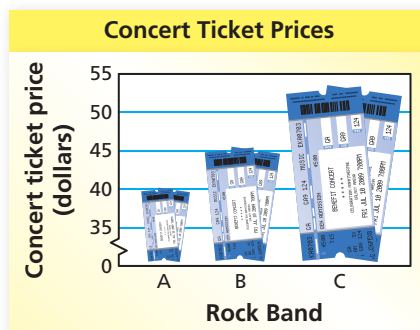
So, the conclusion is not accurate.

On Your Own

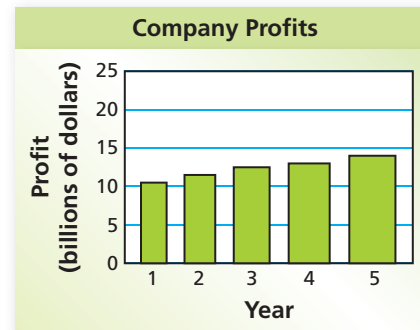
Now You're Ready
Exercises 9–12

Explain why the data display is misleading.

3.



4.



7.4 Exercises



Vocabulary and Concept Check

- REASONING** Can more than one display be appropriate for a data set? Explain.
- OPEN-ENDED** Describe how a histogram can be misleading.



Practice and Problem Solving

- Analyze and display the data in a way that best describes the data. Explain your choice of display.

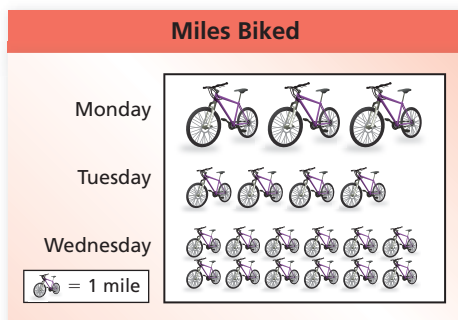
Notebooks Sold in One Week				
192 red	170 green	203 black	183 pink	230 blue
165 yellow	210 purple	250 orange	179 white	218 other

Choose an appropriate data display for the situation. Explain your reasoning.

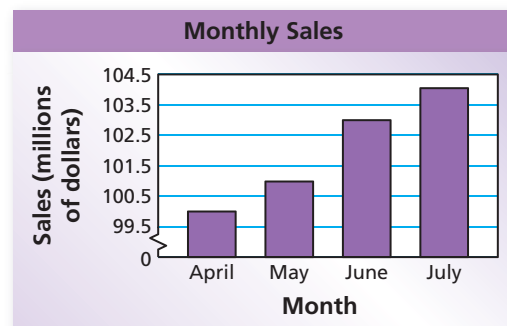
- a student's test scores and how the scores are spread out
 - the distance a person drives each month
 - the outcome of rolling a number cube
 - homework problems assigned each day
- WRITING** When would you choose a histogram instead of a bar graph to display data?

Explain why the data display is misleading.

2 3 9.



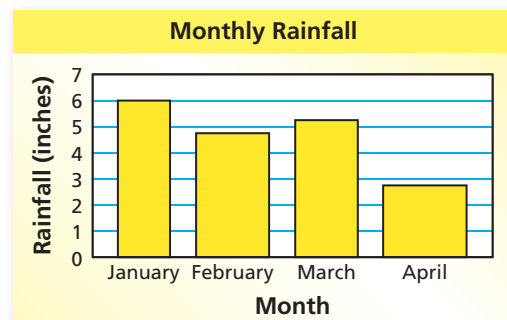
10.



11.

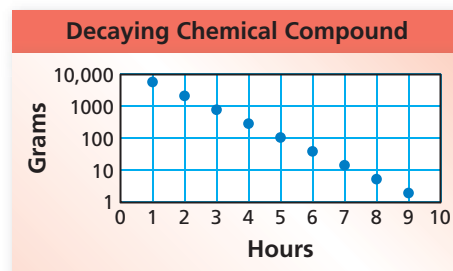


12.



13. **VEGETABLES** A nutritionist wants to use a data display to show the favorite vegetables of the students at a school. Choose an appropriate data display for the situation. Explain your reasoning.

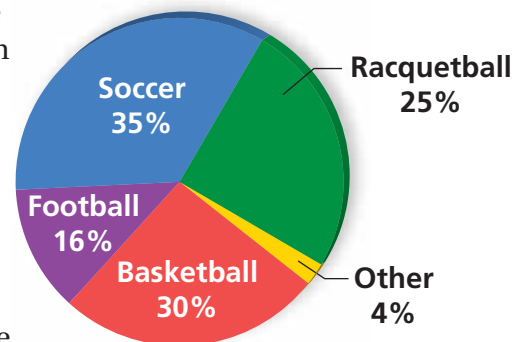
14. **CHEMICALS** A scientist gathers data about a decaying chemical compound. The results are shown in the scatter plot. Is the data display misleading? Explain.



15. **REASONING** What type of data display is appropriate for showing the mode of a data set?

16. **SPORTS** A survey asked 100 students to choose their favorite sports. The results are shown in the circle graph.

Favorite Sports



- Explain why the graph is misleading.
- What type of data display would be more appropriate for the data? Explain.

17. **Critical Thinking** With the help of computers, mathematicians have computed and analyzed billions of digits of the irrational number π . One of the things they analyze is the frequency of each of the numbers 0 through 9. The table shows the frequency of each number in the first 100,000 digits of π .

- Display the data in a bar graph.
- Display the data in a circle graph.
- Which data display is more appropriate? Explain.
- Describe the distribution.

Number	0	1	2	3	4	5	6	7	8	9
Frequency	9999	10,137	9908	10,025	9971	10,026	10,029	10,025	9978	9902



Fair Game Review What you learned in previous grades & lessons

Write the verbal statement as an equation.

18. A number plus 3 is 5.

19. 8 times a number is 24.

20. **MULTIPLE CHOICE** What is 20% of 25% of 400?

(A) 20

(B) 200

(C) 240

(D) 380