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

> **1** **EXPLORATION:** Displaying Data

Work with a partner. Analyze the data and then create a display that best represents the data. Explain your choice of data display.

a. A group of schools in New England participated in a 2-month study and reported 3962 animals found dead along roads.

> birds: 307
>
> mammals: 2746
>
> amphibians: 145
>
> reptiles: 75
>
> unknown: 689

b. The data below show the numbers of black bears killed on a state's roads from 1993 to 2012.

> 1993: 30   2003: 74
> 1994: 37   2004: 88
> 1995: 46   2005: 82
> 1996: 33   2006: 109
> 1997: 43   2007: 99
> 1998: 35   2008: 129
> 1999: 43   2009: 111
> 2000: 47   2010: 127
> 2001: 49   2011: 141
> 2002: 61   2012: 135

c. 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

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1 **EXPLORATION:** Displaying Data (continued)

d. A yearlong study by volunteers in California reported the following numbers of animals killed by motor vehicles.

raccoons: 1693   gray squirrels: 715

skunks: 1372   cottontail rabbits: 629

ground squirrels: 845   barn owls: 486

opossum: 763   jackrabbits: 466

deer: 761   gopher snakes: 363

Communicate Your Answer

2. How can you display data in a way that helps you make decisions?

3. 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   pictograph   line graph

box-and-whisker plot   histogram   dot plot

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Core Concepts

Types of Data

Qualitative data, or **categorical data,** consist of labels or nonnumerical entries that can be separated into different categories. When using qualitative data, operations such as adding or finding a mean do not make sense.

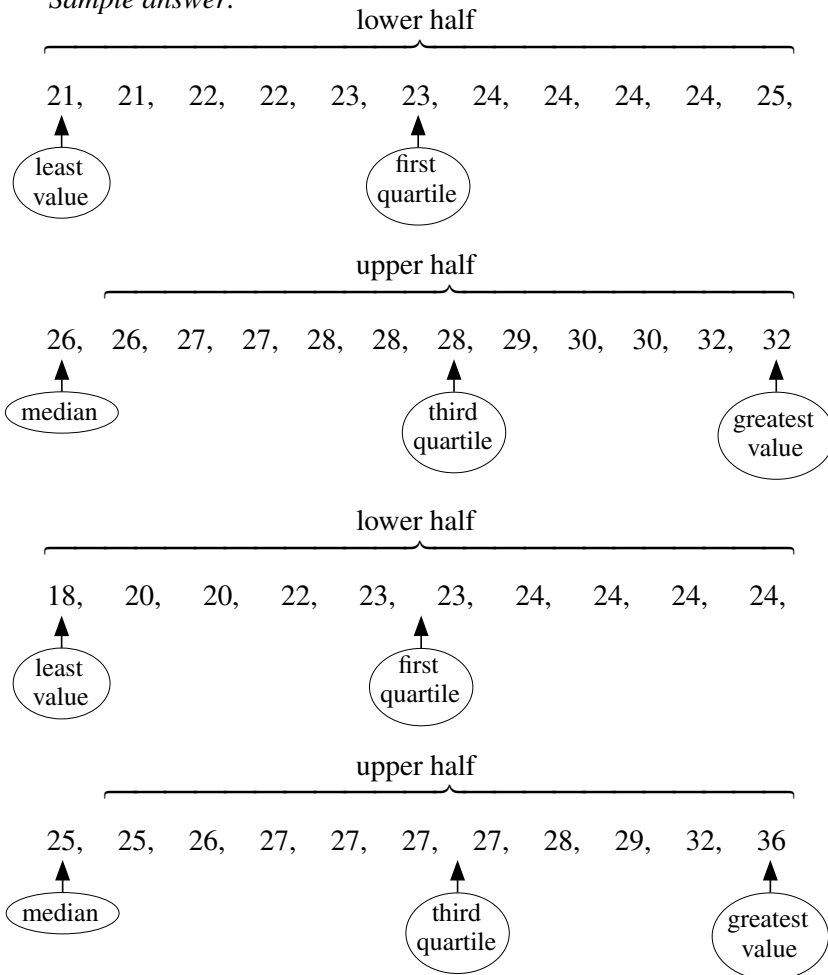**Quantitative data** consist of numbers that represent counts or measurements.

Notes:

Worked-Out Examples

Example #1

Analyze the data and then create a display that best represents the data. Explain your reasoning.

Ages of World Cup Winners	
2010 Men's World Cup Winner (Spain)	2011 Women's World Cup Winner (Japan)
29 24 23 30 32 26 28 30 26 23 32 28 22 28 24 21 27 22 25 21 24 24 27	36 27 24 20 27 23 29 26 25 32 27 27 22 25 24 23 24 28 20 18 24

Sample answer:

lower half

21, 21, 22, 22, 23, 23, 24, 24, 24, 24, 25,

↑ least value   ↑ first quartile

Least value: 21

First quartile: 23

Median: 26

Third quartile: 28

Greatest value: 32

upper half

26, 26, 27, 27, 28, 28, 28, 29, 30, 30, 32, 32

↑ median   ↑ third quartile   ↑ greatest value

lower half

18, 20, 20, 22, 23, 23, 24, 24, 24, 24,

↑ least value   ↑ first quartile

Least value: 18

First quartile: $\frac{23 + 23}{2} = \frac{46}{2} = 23$

Median: 25

Third quartile: $\frac{27 + 27}{2} = \frac{54}{2} = 27$

Greatest value: 36

upper half

25, 25, 26, 27, 27, 27, 27, 28, 29, 32, 36

↑ median   ↑ third quartile   ↑ greatest value
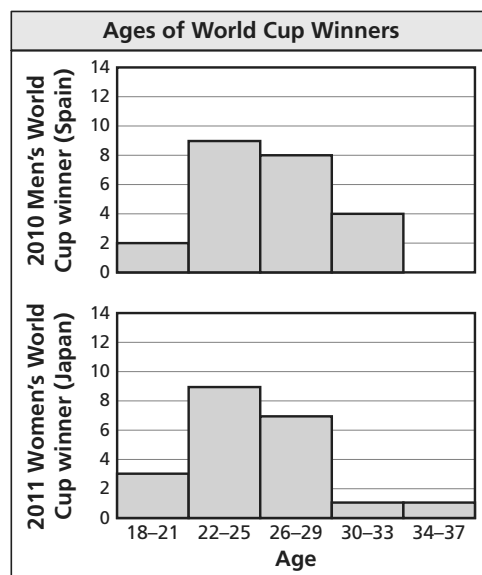
Name_____ Date_____

Ages of World Cup Winners
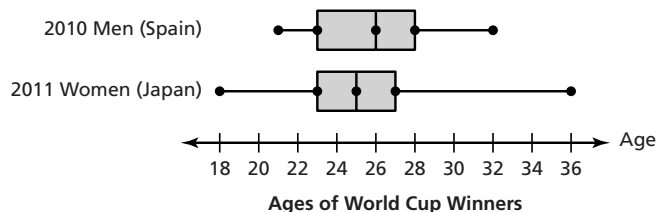
A double box-and-whisker plot shows the distributions of the data.

Example #2

Display the data in Example 1 in another way.

Sample answer:

Age	Frequency for 2010 Men's World Cup Winner (Spain)	Frequency for 2011 Women's World Cup Winner (Japan)
18–21	2	3
22–25	9	9
26–29	8	7
30–33	4	1
34–37	0	1

Ages of World Cup Winners

Practice A

In Exercises 1–4, tell whether the data are *qualitative* or *quantitative*. Explain your reasoning.

1. bookmarks in your web browser

2. heights of players on a basketball team

3. the number of kilobytes in a downloaded file

4. FM radio station numbers

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In Exercises 5 and 6, analyze the data and then create a display that best represents the data. Explain your reasoning.

5.

| Home Runs Each Year											
Babe Ruth						**Hank Aaron**					
0	4	3	2	11	29	13	27	26	44	30	39
54	59	35	41	46	25	40	34	45	44	24	32
47	60	54	46	49	46	44	39	29	44	38	47
41	34	22	6			34	40	20	12	10	

6.

Total Points Scored by a Basketball Team for Each Game					
48	56	49	52	40	65
30	47	62	40	59	37
45	41	44	33	44	30

In Exercises 7 and 8, describe how the graph is misleading. Then explain how someone might misinterpret the graph.

7.

8.

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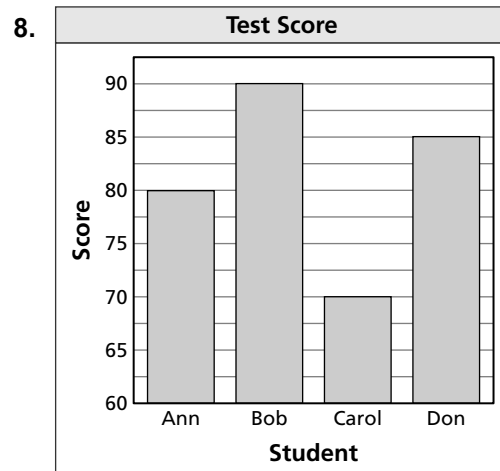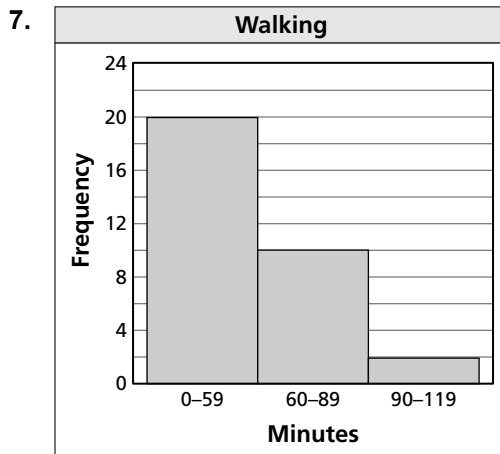
Practice B

In Exercises 1–4, tell whether the data are *qualitative* or *quantitative*.
Explain your reasoning.

1. numbers of cans of vegetables at a food pantry

2. names of players on your school soccer team

3. balances in the savings accounts at a bank

4. numbers on the backs of the jerseys of your school football team

In Exercises 5 and 6, choose an appropriate data display for the situation.
Explain your reasoning.

5. bowling scores for all of the students on the team

6. the price of a gallon of gas on January 1st over a 10-year period

In Exercises 7 and 8, describe how the graph is misleading. Then explain
how someone might misinterpret the graph.

7.

Named Winter Storms

8.