REVIEW KEY VOCABULARY

- survey
- population
- sample: random, stratified random, systematic, convenience, self-selected
- biased sample
- biased question
- mean, median, mode

- measure of dispersion
- range
- mean absolute deviation
- variance
- standard deviation
- marginal frequency
- joint frequency

- stem-and-leaf plot
- frequency, frequency table
- histogram
- box-and-whisker plot
- lower quartile, upper quartile
- interquartile range
- outlier

VOCABULARY EXERCISES

Copy and complete the statement.

1. In a __?__ sample, a rule is used to select members of the population.

2. In a two-way frequency table, the row and column totals give the __?__.

3. **WRITING** *Explain* what the "box" and the "whiskers" represent on a box-and-whisker plot.

REVIEW EXAMPLES AND EXERCISES

Use the review examples and exercises below to check your understanding of the concepts you have learned in each lesson of this chapter.

10.1 Analyze Surveys and Samples

EXAMPLE

You create a survey to determine what type of music is the favorite of students in your grade. You ask each surveyed student, "What is your favorite type of music, classical or country?"

Tell whether the question is potentially biased. Explain your answer. If the question is potentially biased, rewrite it so that it is not.

The question is biased, because it does not allow students to choose a type of music other than classical or country. An unbiased question is "What is your favorite type of music?"

EXERCISES

EXAMPLE 1
for Ex. 4

4. **SURVEY** In the example above, suppose you create a questionnaire and distribute one to every student in your grade. There is a box in the cafeteria where students can drop off completed questionnaires during lunch. Identify the sampling method.

10.2 Use Measures of Central Tendency and Dispersion

EXAMPLE

The amounts of snowfall (in inches) in one town for 8 months of the year are listed below. Find the mean, median, and mode(s) of the data. Which measure of central tendency best represents the data?

0.5, 0.5, 1.5, 2.0, 3.5, 4.5, 16.5, 30.5

$$\overline{x} = \frac{0.5 + 0.5 + 1.5 + 2.0 + 3.5 + 4.5 + 16.5 + 30.5}{8} = \frac{59.5}{8} = 7.4375 \text{ inches}$$

The median is the mean of the two middle values, 2.0 and 3.5, or 2.75 inches.

The mode is 0.5 inch.

The median best represents the data. The mean is greater than most of the data values. The mode is less than most of the data values.

EXERCISES

5. BASEBALL STATISTICS The numbers of home runs hit by baseball player Manny Ramirez against several different opposing teams over 3 seasons are 5, 1, 10, 5, 5, 4, 1, 0, 7, 2, 1, 1, 1, 9, 6, 1, 2, 6, 2, 19, 6, and 17.

a. Find the mean, median, and mode(s) of the data.

b. Which measure of central tendency best represents the data? *Explain*.

10.3 Analyze Data

EXAMPLE

There are 212 students in a tutoring program for younger students. Of these, 131 tutor math and 81 tutor science. No one tutors both. There are 78 girls tutoring math, 42 boys tutoring science, and a total of 117 girls tutoring. Make a two-way frequency table for the data.

The categories are math, science, girls, and boys. Fill in the given information.
Girls tutoring science: $117 - 78 = 39$
Boys tutoring math: $131 - 78 = 53$
Boys tutoring: $42 + 53 = 95$

	Math	**Science**	**Total**
Girls	78	39	117
Boys	53	42	95
Total	131	81	212

EXERCISES

6. In the example above, suppose that last year, 198 students tutored in all. Of those, 122 students (including 86 boys) tutored math, and 43 girls tutored science. Make a two-way frequency table for the data.

10.4 Interpret Stem-and-Leaf Plots and Histograms

EXAMPLE

The prices (in dollars) of several books are listed below. Make a stem-and-leaf plot of the prices.

14, 15, 9, 19, 21, 29, 12, 25, 10, 8, 15, 13, 15, 20

STEP 1 **Separate** the data into stems and leaves.

Book Prices

Stem	Leaves
0	9 8
1	4 5 9 2 0 5 3 5
2	1 9 0 5

Key: 1 | 4 = $14

STEP 2 **Write** the leaves in increasing order.

Book Prices

Stem	Leaves
0	8 9
1	0 2 3 4 5 5 5 9
2	0 1 5 9

Key: 1 | 4 = $14

EXERCISES

7. EXERCISING The minutes per day that the students in a class spend exercising are listed below. Make a stem-and-leaf plot of the data.

20, 25, 0, 10, 0, 30, 35, 20, 45, 25, 40, 0, 0, 0, 5, 10, 20, 15, 20, 30
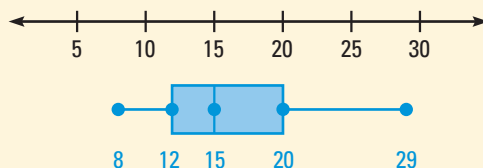
10.5 Interpret Box-and-Whisker Plots

EXAMPLE

Make a box-and-whisker plot of the book prices in the example above.

Order the data. Then find the median and quartiles.

Upper quartile   **Median** = 15   **Lower quartile**

8 9 10 **12** 13 14 15 15 15 19 **20** 21 25 29

Plot the median, the quartiles, the maximum value, and the minimum value below a number line. Draw the box and the whiskers.

EXERCISES

8. EXERCISING Use the data in Exercise 7 to make a box-and-whisker plot of the minutes per day that the students in the class spend exercising.