

Chapter 1

2. Using the state standards for mathematics for the content area of data analysis and probability for your state, identify the middle school objectives that are found in Chapter 1. The following website may be useful: www.doe.state.in.us. This website will allow you to access the web pages of the state departments of education for the 50 states. From the state web pages you should be able to find the state's mathematical standards.

Exploration 1.1 question 2 asked you to decide what information you would want from each teacher or school. In formulating your responses, you probably generated a long list of information you would like to have about the workload and responsibilities of middle school teachers. Your list might include some of the following:

- Subjects typically taught in middle school.
- Amount of time spent on each subject in a typical day.
- Number of students in each class.
- Number of students in each grade level.
- Grade levels typically included in a middle school.
- Salaries and other benefits to teachers.
- Types of duties other than teaching (lunchroom supervisor, bus supervisor, etc.).
- Amount of time spent on school-related work outside of school hours.

4. Classify each of the variables below as categorical or quantitative. If the variable is categorical, decide whether it is nominal or ordinal. If the variable is quantitative, decide whether it is interval or ratio.
- a. Type of television show (comedy, drama, sports, etc. . .)
 - b. Length of time watching television in a given day
 - c. Olympic medal types (gold, silver, bronze)
 - d. Temperature in degrees Fahrenheit
 - e. Number of children in a family
 - f. Area codes for long-distance calls
 - g. Number of minutes spent grading homework papers on a particular night
 - h. How much children like broccoli (really like, like, it's okay, don't like, really don't like)

8. Identify the sampling technique used in each of the following situations. Explain why you chose that particular technique for the situation and discuss the advantages/disadvantages of the technique in each situation.
- a. Ms. Kidder assigns a different number to each of her 23 students. She then uses her calculator to randomly select five of those students to put up a new bulletin board display.
 - b. Every sixth student in the cafeteria line is given a carrot stick with their lunch instead of a celery stick.
 - c. The State Department of Agriculture decides to check on the average number of bushels per acre of corn being harvested in the state of Iowa. There are 99 counties in Iowa. They randomly select 10 of those counties and survey all of the farmers in those counties regarding the corn harvest.
 - d. The Internal Review Service decides to audit every 500th income return that they receive in their office.
 - e. Mr. Marshall polls his sixth period science class to determine whether more students like football or more like basketball.
- f. New Mexico has 33 counties. Suppose those counties are classified by high income, middle income, or low income based on the average annual income of the residents of those counties. From each of those three classifications, two counties are selected at random to be polled on the effects of a proposed tax hike.
- g. Parents attending a basketball game at the local high school are asked to complete a survey on the types of snacks they would like to see sold at the concession stand.

Chapter 2

2. Using the state standards for mathematics for the content area of data analysis and probability for your state, identify the middle school objectives that are found in Chapter 2. The following website may be useful: www.doe.state.in.us. This website will allow you to access the web pages of the state departments of education for the 50 states. From the state web pages you should be able to find the state's mathematical standards.

4. A regular six-sided number cube is rolled 50 times. The number of dots showing on each roll is recorded below:

2 2 5 3 4 1 5 3 3 4 2 4 3
2 6 3 6 5 6 2 2 2 5 5 3 3
6 6 4 3 1 6 1 1 2 2 3 3 5
4 3 4 4 2 4 6 1 6 1 3

- Construct a relative frequency table for the data.
- Construct a bar graph for the data.
- Construct a circle graph for the data.

6. The number of cups of coffee consumed per day by a college professor over a 30-day period are shown below:

5 5 8 3 9 2 3 6 5 4
4 5 5 6 10 3 6 6 7 8
6 5 6 4 2 5 6 6 5 4

- Construct a frequency distribution for the data.
- Construct a line plot for the data.
- Would a stem-and-leaf plot be a good choice to represent this data? Why or why not?
- Construct a histogram for this data set.

8. The data presented in the table below is taken from the website of the Statistical Abstract of the United States. The data show the number of total households (as defined by the Census Bureau) in 1,000 s from 1900 to 2000 (www.census.gov/statab/www).

| Year | Total Number of Households (in 1,000 s) |
|------|---|
| 1900 | 15,964 |
| 1910 | 20,256 |
| 1920 | 24,352 |
| 1930 | 29,905 |
| 1940 | 34,949 |
| 1950 | 42,251 |
| 1960 | 53,024 |
| 1970 | 63,450 |
| 1980 | 80,390 |
| 1990 | 91,947 |
| 2000 | 105,480 |

Construct a line graph to display the data. Be sure to label your axes! Remember to avoid the pitfalls of misleading graphs that you studied in Section 2.3.

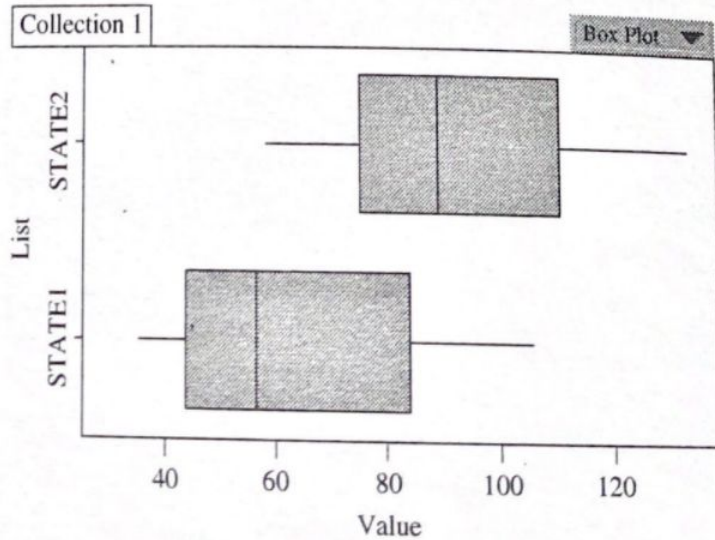
Chapter 3

9. The following data represent the number of miles driven per day by a government employee over a 20-day period.

56 78 120 145 120 96 34 254 120 137
120 78 78 206 83 43 122 187 158 62

- Find the five-number summary for this data set.
- Construct a box plot using your five-number summary in part a.
- Determine the interquartile range for this data set.
- Determine any outliers for this data set. If there are outliers, redraw your box plot to show the outliers.

- display and then sketch a copy of the graph in your homework.
13. Mike and Debbie were comparing utility bills for two different states over a 12-month period. The box plots for their data shown below are the Fathom-generated box plots.



| | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---------|-------|-------|-------|------|------|------|------|------|------|------|------|-------|
| State 1 | \$98 | \$106 | \$83 | \$56 | \$48 | \$38 | \$42 | \$45 | \$35 | \$57 | \$66 | \$85 |
| State 2 | \$120 | \$134 | \$120 | \$94 | \$67 | \$58 | \$86 | \$92 | \$84 | \$68 | \$82 | \$102 |

Using the box plots from Fathom, compare the utility costs from the two states. Which state would you rather live in and why?