1.12 Frequent users of social media. A recent survey by the Pew Research Center asked social media users about how often they visited various sites. Pew defined a frequent user to be someone who visited a site several times a day. Here are the percents of users who are frequent users for several popular sites:[9] SOCIALM

Social media	Frequent users (%)
Facebook	51
Snapchat	46
Instagram	42
YouTube	32
Twitter	25

Use a bar graph to describe the percents of frequent users of these sites and write a short summary of the data based on your graph.

1.13 Pie chart for frequent users of social media. Refer to the previous exercise. SOCIALM

(a) Use a pie chart to describe the percents of frequent users of these sites and write a short summary of the data based on your chart.

(b) Compare this pie chart with the bar graph that you produced for the previous exercise. Which do you prefer? Give reasons for your answer.

1.14 Facebook users by country. The following table gives the numbers of active Facebook users by country for the top 11 countries based on the number of users in July 2019.[10] FACEBK

Country	Facebook users (in millions)
India	270
United States	190
Indonesia	130
Brazil	120
Mexico	82
Philippines	68
Vietnam	58
Thailand	46
Egypt	38
Turkey	37
United Kingdom	37

(a) Use a bar graph to describe the numbers of users in these countries.

(b) Describe the major features of your graph in a short paragraph.

1.15 Potassium from potatoes. The 2015 Dietary Guidelines for Americans[11] notes that the average potassium (K) intake for U.S. adults is about half of the recommended amount. A major source of potassium is potatoes. Nutrients in the diet can have different absorption depending on the source. One study looked at absorption of potassium, measured in milligrams (mg), from different sources. Participants ate a controlled diet for five days, and the amount of potassium absorbed was measured. Data for a diet that included 40 milliequivalents (mEq) of potassium were collected from 27 adult subjects.[12] KPOT40

(a) Make a stemplot of the data.

(b) Describe the pattern of the distribution.

(c) Are there any outliers? If yes, describe them and explain why you have declared them to be outliers.

(d) Describe the shape, center, and spread of the distribution.

1.16 Potassium from a supplement. Refer to the previous exercise. Data were also recorded for 29 subjects who received a potassium salt supplement with 40 mEq of potassium. Answer the questions in the previous exercise for the supplemented subjects. KSUP40

1.17 Energy consumption. The U.S. Energy Information Administration reports data summaries of various energy statistics. Let's look at the total amount of energy consumed, in quadrillions of British thermal units (Btu), for each month in a recent year. Here are the data:[13] ENERGY

Month	Energy (quadrillion Btu)	Month	Energy (quadrillion Btu)
January	9.58	July	8.23
February	8.46	August	8.21
March	8.56	September	7.64
April	7.56	October	7.78
May	7.66	November	8.19
June	7.79	December	8.82

(a) Look at the table and describe how the energy consumption varies from month to month.

(b) Make a time plot of the data and describe the patterns.

(c) Suppose you wanted to communicate information about the month-to-month variation in energy consumption. Which would be more effective, the table of the data or the graph? Give reasons for your answer.

1.18 Energy consumption in a different year. Refer to the previous exercise. Here are the data for the previous year: ENERGY

Month	Energy (quadrillion Btu)	Month	Energy (quadrillion Btu)
January	8.99	July	8.27
February	8.02	August	8.17
March	8.38	September	7.64
April	7.52	October	7.72
May	7.62	November	8.14
June	7.72	December	9.08

1.33 Potassium from potatoes. Refer to Exercise 1.15 (page 22), where you examined the potassium absorption of a group of 27 adults who ate a controlled diet that included 40 mEq of potassium from potatoes for five days. In Exercise 1.15, you used a stemplot to examine the distribution of the potassium absorption. KPOT40

(a) Make a histogram and use it to describe the distribution of potassium absorption.

(b) Make a boxplot and use it to describe the distribution of potassium absorption.

(c) Compare the stemplot, the histogram, and the boxplot as graphical summaries of this distribution. Which do you prefer? Give reasons for your answer.

1.56 Longleaf pine trees. The Wade Tract in Thomas County, Georgia, is an old-growth forest of longleaf pine trees (*Pinus palustris*) that has survived in a relatively undisturbed state since before the settlement of the area by Europeans. A study collected data on 584 of these trees.[27] One of the variables measured was the diameter at breast height (DBH). This is the diameter of the tree at 4.5 feet, and the units are centimeters (cm). Only trees with DBH greater than 1.5 cm were sampled. Here are the diameters of a random sample of 40 of these trees: PINES

10.5	13.3	26.0	18.3	52.2	9.2	26.1	17.6	40.5	31.8
47.2	11.4	2.7	69.3	44.4	16.9	35.7	5.4	44.2	2.2
4.3	7.8	38.1	2.2	11.4	51.5	4.9	39.7	32.6	51.8
43.6	2.3	44.6	31.5	40.3	22.3	43.3	37.5	29.1	27.9

(a) Find the five-number summary for these data.

(b) Make a boxplot.

(c) Make a histogram.

(d) Write a short summary of the major features of this distribution. Do you prefer the boxplot or the histogram for these data?

1.57 Weight gain. A study of diet and weight gain deliberately overfed 15 volunteers for eight weeks. The mean increase in fat was $\bar{x} = 2.31$ kilograms, and the standard deviation was $s = 1.30$ kilograms. What are $\bar{x}$ and s, in pounds? (A kilogram is 2.2 pounds.)

1.58 Changing units from inches to centimeters. Changing the unit of length from inches to centimeters multiplies each length by 2.54 because there are 2.54 centimeters in an inch. This change of units multiplies our usual measures of spread by 2.54. This is true of *IQR* and the standard deviation. What happens to the variance when we change units in this way?

1.59 A different type of mean. The **trimmed mean** is a measure of center that is more resistant than the mean but uses more of the available information than the median. To compute the 10% trimmed mean, discard the highest 10% and the lowest 10% of the observations and compute the mean of the remaining 80%. Trimming eliminates the effect of a small number of outliers. Compute the 10% trimmed mean of the beer alcohol data in Exercise 1.44 (page 45). Then compute the 20% trimmed mean. Compare the values of these measures with the median and the ordinary untrimmed mean. BEER

1.60 Changing units from centimeters to inches. Refer to Exercise 1.56. Change the measurements from centimeters to inches by multiplying each value by 0.39. Answer the questions from that exercise and explain the effect of the transformation on these data. PINES

1.44 The alcohol content of beer. Brewing beer involves a variety of steps that can affect the alcohol content. A website gives the percent alcohol for 160 domestic brands of beer.[25] Use graphical and numerical summaries of your choice to describe the data. Give reasons for your choice. BEER

1.45 Outliers for alcohol content of beer. Refer to the previous exercise. BEER

(a) Calculate the mean with and without the outliers. Do the same for the median. Explain how these values change when the outliers are excluded.

(b) Calculate the standard deviation with and without the outliers. Do the same for the quartiles. Explain how these values change when the outliers are excluded.

(c) Write a short paragraph summarizing what you have learned in this exercise.

Refer to the previous two

1.103 Longleaf pine trees. Exercise 1.56 (page 46) gives the diameter at breast height (DBH) for 40 longleaf pine trees from the Wade Tract in Thomas County, Georgia. Make a Normal quantile plot for these data and write a short paragraph interpreting what it describes. PINES