2.10 Generating Electricity In 2012 in the United States, most electricity was generated from coal (37%), natural gas (30%), or nuclear power plants (19%). Hydropower accounted for 7% of the total electricity produced; other renewable sources such as wind or solar power accounted for 5%. Other nonrenewable sources (such as petroleum) made up the remaining 2%. (*Source:* http://www.eia.gov/electricity/annual/html/epa_01_01.html)

a. Display this information in a bar graph.

b. Which is easier to sketch relatively accurately, a pie chart or a bar chart?

c. What is the advantage of using a graph to summarize the results instead of merely stating the percentages for each source?

d. What is the modal category?

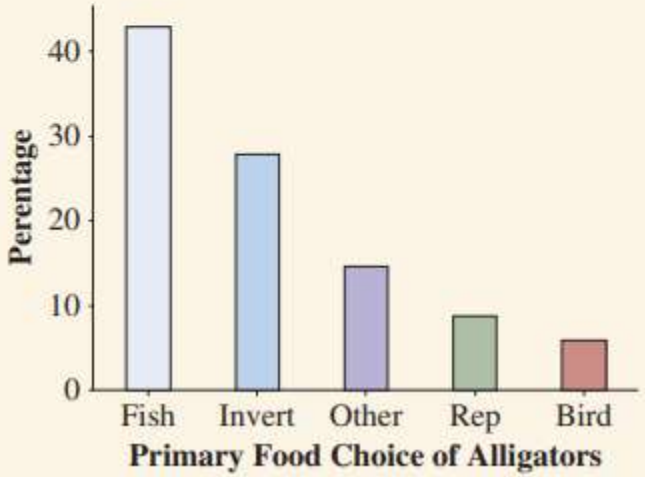
2.11 What do alligators eat? The bar chart is from a study[2] investigating the factors that influence alligators' choice of food. For 219 alligators captured in four Florida lakes, researchers classified the primary food choice (in volume) found in the alligator's stomach in one of the categories—fish, invertebrate (snails, insects, crayfish), reptile (turtles, baby alligators), bird, or other (amphibian, mammal, plants). (Data available on the book's website.)

a. Is primary food choice categorical or quantitative?

b. Which is the modal category for primary food choice?

c. About what percentage of alligators had fish as the primary food choice?

d. This type of bar chart, with categories listed in order of frequency, has a special name. What is it?



2.13 France is most popular holiday spot Which countries are most frequently visited by tourists from other countries? The table shows results according to *Travel and Leisure* magazine (2005).

a. Is country visited a categorical or a quantitative variable?

b. In creating a bar graph of these data, would it be most sensible to list the countries alphabetically or in the form of a Pareto chart? Explain.

c. Does either a dot plot or stem-and-leaf plot make sense for these data? Explain.

Most Visited Countries, 2005

Country	Number of Visits (millions)
France	77.0
China	53.4
Spain	51.8
United States	41.9
Italy	39.8
United Kingdom	24.2
Canada	20.1
Mexico	19.7

Source: Data from *Travel and Leisure* magazine, 2005.

center by quoting appropriate statistics.

2.41 European fertility The European fertility rates (mean number of children per adult woman) from Exercise 2.18 are shown again in the table.

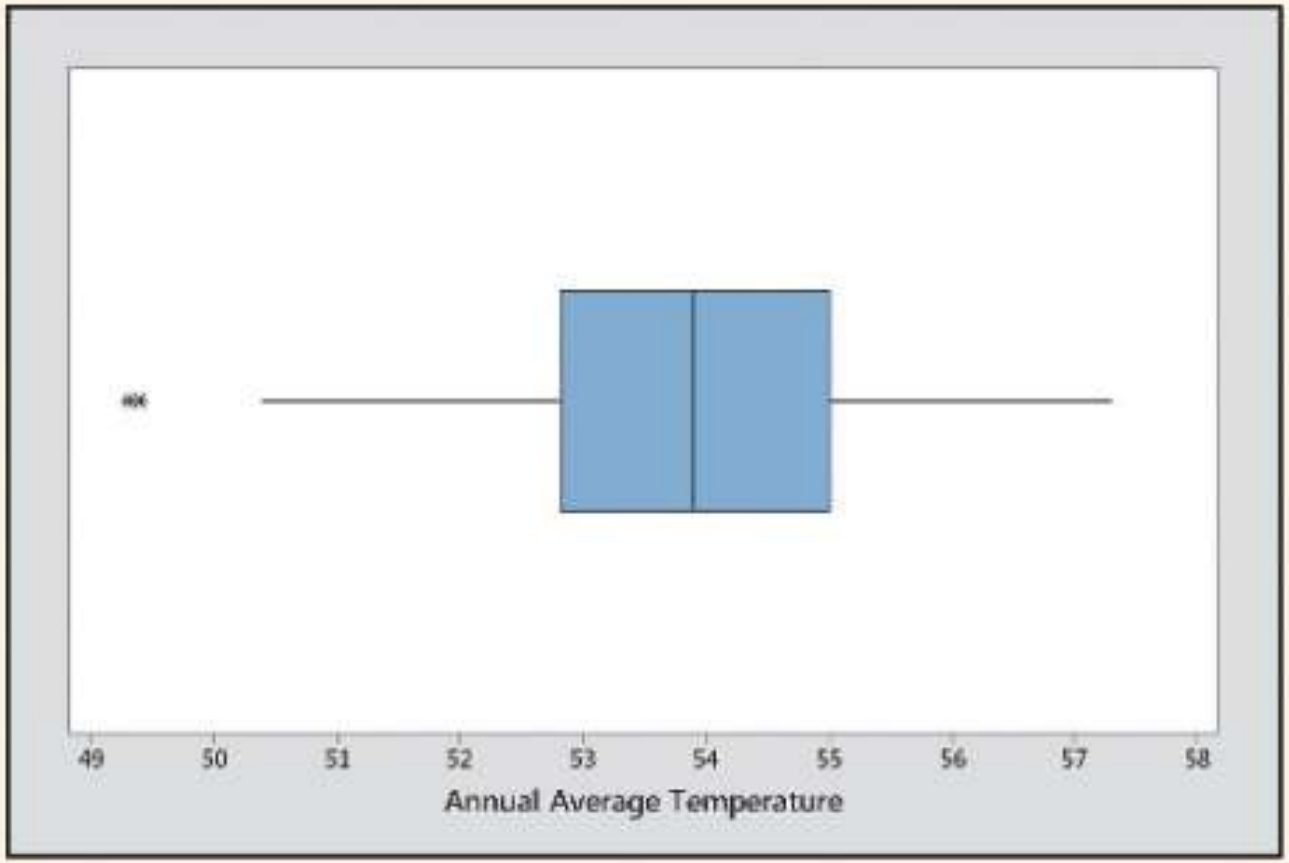
a. Find the median of the fertility rates. Interpret.

b. Find the mean of the fertility rates. Interpret.

c. For each woman, the number of children is a whole number, such as 2 or 3. Explain why it makes sense to measure a *mean* number of children per adult woman (which is not a whole number) to compare fertility levels, such as the fertility levels of 1.5 in Canada and 2.4 in Mexico.

Country	Fertility	Country	Fertility
Austria	1.4	Netherlands	1.7
Belgium	1.7	Norway	1.8
Denmark	1.8	Spain	1.3
Finland	1.7	Sweden	1.6
France	1.9	Switzerland	1.4
Germany	1.3	United Kingdom	1.7
Greece	1.3	United States	2.0
Ireland	1.9	Canada	1.5
Italy	1.3	Mexico	2.4

2.72 Central Park temperature distribution revisited
Exercise 2.26 showed a histogram for the distribution of Central Park annual average temperatures. The box plot for these data is shown here.



a. If this distribution is skewed, would you expect it to be skewed to the right or to the left? Explain.

b. Approximate each component of the five-number summary and interpret.

8.18 Stem cell research A Harris poll of a random sample of 2113 adults in the United States in October 2010 reported that 72% of those polled believe that stem cell research has merit. (*Source:* www.harrisinteractive.com/vault/Harris-Interactive-Poll-HealthDay-2010-10.pdf.) The results, presented using MINITAB software, are

X	N	Sample p	95% CI
1521	2113	0.7198	(0.7007, 0.7390)

Here, X denotes the number who believed that stem cell research has merit.

a. Explain how to interpret "Sample p" and "95% CI" on this printout.

b. What is the 95% margin of error associated with the poll?

8.40 Work hours per week The General Social Survey asked 40 respondents about the number of hours they usually work in a week. A researcher analyzing data from the 2014 GSS obtained the following StatCrunch output:

95% confidence interval results:

μ : Mean of variable

Variable	Sample Mean	Std. Dev.	Std. Err.	DF	L. Limit	U. Limit
Number of work hours in a week	38.7	12.416284	1.9631868	39	34.72908	42.67092

a. Show how to construct the confidence interval from the other information provided.

b. Can you conclude that the population mean is larger than 43? Explain.

c. Would the confidence interval be wider, or narrower,
(i) if you constructed a 99% confidence interval?
(ii) if $n = 400$ instead of 40?

8.69 **Work agreement for nannies** According to a 2016 poll of families in New York City who employ a nanny, 75% did not enter into a written work agreement with them.

a. What has to be assumed about this sample to construct a confidence interval for the population proportion of all families who did not enter into a written work agreement with their nannies?

b. Assuming the size of the sample in this poll is 5000, construct a 99% confidence interval for the population proportion.

c. Can you conclude that more than 70% of families who employ nannies do not enter into a written work agreement with them?