MINITAB **Minitab 15 and earlier versions:** Enter or open the data in a column, click on **Graph,** then **Histogram.** Select the "Simple" histogram. Enter the column in the "Graph variables" window and click **OK. Minitab 16:** Click on **Assistant** and select **Graphical Assistant.** Click on **Histogram,** select the column to be used, and then click **OK.**

Minitab uses default settings for the class width and starting point, but those defaults can be changed as follows: Right-click on the horizontal axis and select **Edit X scale,** then use the **Scale** tab to enter the locations of the tick marks (class boundaries or class midpoints), and use the **Binning** tab to enter the midpoints of the classes. See Figures 2-2, 2-3, and 2-4 for examples of Minitab-generated histograms.

TI-83/84 PLUS Enter a list of data in L1 or use a list of values assigned to a name. Select the **STAT PLOT** function by pressing 2ND Y=. Press ENTER and use the arrow keys to turn Plot1 to "On" and select the graph with bars. The screen display should be as shown here.

If you want to let the calculator determine the class width and starting point, press ZOOM 9 to get a histogram with default settings. (To enter your own class width and class boundaries, press WINDOW and enter the maximum and minimum values. The Xscl value will be the class width. Press GRAPH to osbtain the graph.)

EXCEL Excel can generate histograms, but it is *extremely* difficult. To generate a histogram easily, use XLSTAT. After loading XLSTAT with Excel included, click on **XLSTAT** at the top. Select **Visualizing Data,** then select **Histograms.** In the Data box, enter the range of cells containing the data, such as A1:A78 for 78 values in column A. Click on the "Sample labels" box only if the first cell contains the name of your data. You can click **OK** to get a histogram with default settings, or you can click on the **Options** tab. One of the options is "User defined," which allows you to enter the range of cells containing your desired class boundaries that you must enter in another column.

STATCRUNCH Click on **Open StatCrunch,** then enter or open a data set. Click on **Graphics,** then click on **Histogram.** Select the column containing the data. Click on **Next** to enter a desired starting point and class width. Click **Create Graph.**

2-3 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. Histogram Table 2-2 is a frequency distribution summarizing the IQ scores of the low lead group listed in Table 2-1, and Figure 2-2 is a histogram depicting that same data set. When trying to better understand the IQ data, what is the advantage of examining the histogram instead of the frequency distribution?

2. Voluntary Response Sample The histogram in Figure 2-2 on page 55 is constructed from a *simple random sample* of children. If you construct a histogram with data collected from a *voluntary response sample,* will the distribution depicted in the histogram reflect the true distribution of the population? Why or why not?

3. Small Data NASA provides these duration times (in minutes) of all flights of the space shuttle *Challenger:* 7224, 8784, 8709, 11,476, 10,060, 11,844, 10,089, 11,445, 10,125, 1. Why does it not make sense to construct a histogram for this data set? What is notable about this data set?

4. Normal Distribution When it refers to a normal distribution, does the term "normal" have the same meaning as in ordinary language? What criterion can be used to determine whether the data depicted in a histogram have a distribution that is approximately a normal distribution? Is this criterion totally objective, or does it involve subjective judgment?