

needs more people who can create original graphs that enlighten us about the nature of data. For some really helpful information about graphs, see *The Visual Display of Quantitative Information*, second edition, by Edward Tufte (Graphics Press, PO Box 430, Cheshire, CT 06410). Here are just a few of the important principles that Tufte suggests:

- For small data sets of 20 values or fewer, use a table instead of a graph.
- A graph of data should make us focus on the true nature of the data, not on other elements, such as eye-catching but distracting design features.
- Do not distort data; construct a graph to reveal the true nature of the data.
- Almost all of the ink in a graph should be used for the data, not for other design elements.

using TECHNOLOGY

Here we list the graphs that can be generated by various technologies. (Detailed instructions can range from quite simple to extremely complex, so see the individual manuals that are supplements to this book.)

STATDISK Histograms, scatterplots, and pie charts

MINITAB Histograms, frequency polygons, dotplots, stemplots, bar graphs, multiple bar graphs, Pareto charts, pie charts, scatterplots, and time-series graphs

EXCEL Histograms and scatterplots

TI-83/84 PLUS Histograms and scatterplots

STATCRUNCH Histograms, scatterplots, pie charts, bar charts, stemplots, and dotplots

2-4 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. Bar Chart and Pareto Chart A bar chart and a Pareto chart both use bars to show frequencies of categories of categorical data. What characteristic distinguishes a Pareto chart from a bar chart, and how does that characteristic help us in understanding the data?

2. Scatterplot What is a scatterplot? What type of data is required for a scatterplot? What characteristic of the data can be better understood by looking at a scatterplot?

3. SAT Scores Listed below are SAT scores from a sample of students (based on data from www.talk.collegeconfidential.com). Why is it that a graph of these data will not be very effective in helping us understand the data?

2400 2200 2150 2040 2230 1890 2100 2090

4. SAT Scores Given that the data in Exercise 3 were obtained from students who made a decision to submit their SAT scores to a Web site, what type of sample is given in that exercise? If we had a much larger sample of that type, would a graph help us understand some characteristics of the population?

Scatterplots. In Exercises 5–8, use the given paired data from Appendix B to construct a scatterplot.

5. President's Heights Refer to Data Set 12 in Appendix B, and use the heights of U.S. presidents and the heights of their main opponents in the election campaign. Does there appear to be a correlation?