Cooperative Group Activities

1. In-class activity Using a package of purchased chocolate chip cookies, each student should be given two or three cookies. Proceed to count the number of chocolate chips in each cookie. Not all of the chocolate chips are visible, so "destructive testing" must be used through a process involving consumption. Record the numbers of chocolate chips for each cookie and combine all results. Construct a frequency distribution, histogram, dotplot, and stemplot of the results. Given that the cookies were made through a process of mass production, we might expect that the numbers of chips per cookie would not vary much. Is that indicated by the results? Explain. (See "Chocolate Chip Cookies as a Teaching Aid" by Herbert K. H. Lee, *American Statistician*, Vol. 61, No. 4.)

2. In-class activity In class, each student should record two pulse rates by counting the number of her or his heartbeats in one minute. The first pulse rate should be measured while seated, and the second pulse rate should be measured while standing. Using the pulse rates measured while seated, construct a frequency distribution and histogram for the pulse rates of males, and then construct another frequency distribution and histogram for the pulse rates of females. Using the pulse rates measured while standing, construct a frequency distribution and histogram for the pulse rates of males, and then construct another frequency distribution and histogram for the pulse rates of females. Compare the results. Do males and females appear to have different pulse rates? Do pulse rates measured while seated appear to be different from pulse rates measured while standing? Use an appropriate graph to determine whether there is a relationship between sitting pulse rate and standing pulse rate.

3. In-class activity Given below are recent measurements from the Old Faithful geyser in Yellowstone National Park. The time intervals between eruptions are matched with the corresponding times of duration of the geyser; thus the interval of 76 min is paired with the duration of 4.53 min, the interval of 84 min is paired with the duration of 3.83 min, and so on. Use the methods of this chapter to summarize and explore each of the two sets of data separately, and then investigate whether there is some relationship between them. Describe the methods used and the conclusions reached.

Intervals (min) between eruptions

76 84 76 103 92 47 98 54 80 91 69 86 83 75 93

89 96 65 94 85 94 60 94 86 93 88 61 96 52 98

Durations (min) of eruptions

4.53 3.83 3.83 4.23 4.70 1.83 4.00 2.00 3.57 4.25 2.75 4.47 3.35 3.27 4.30

4.25 4.05 2.12 4.63 4.18 4.05 2.13 4.60 4.53 3.70 4.17 1.87 4.68 1.83 4.10

4. Out-of-class activity Search newspapers and magazines to find an example of a graph that is misleading. (See Examples 13 and 14 in Section 2-4.) Describe how the graph is misleading. Redraw the graph so that it depicts the information correctly.

5. Out-of-class activity Obtain a copy of *The Visual Display of Quantitative Information,* second edition, by Edward Tufte (Graphics Press, PO Box 430, Cheshire, CT 06410). Find the graph describing Napoleon's march to Moscow and back, and explain why Tufte says that "it may well be the best graphic ever drawn."

6. Out-of-class activity Obtain a copy of *The Visual Display of Quantitative Information,* second edition, by Edward Tufte (Graphics Press, PO Box 430, Cheshire, CT 06410). Find the graph that appeared in *American Education,* and explain why Tufte says that "this may well be the worst graphic ever to find its way into print." Construct a graph that is effective in depicting the same data.