Cooperative Group Activities

1. Out-of-class activity Bring a tape measure to a movie theater, car, bus, train, or subway, and measure the distance between the front of your vertical seat cushion and the back of the seat in front. See the Data to Decision Project for the relevant lengths and parameters. Analyze the seating design and write a brief report of the results.

2. Out-of-class activity Use the Internet to find Pick 4 lottery results for 50 different drawings. Find the 50 different means. Graph a histogram of the original 400 digits that were selected, and graph a histogram of the 50 sample means. What important principle do you observe?

3. In-class activity Divide into groups of three or four students and address these issues affecting the design of manhole covers.

• Which of the following is most relevant for determining whether a manhole cover diameter of 24 in. is large enough: weights of men, weights of women, heights of men, heights of women, hip breadths of men, hip breadths of women, shoulder breadths of men, shoulder breadths of women?

• Why are manhole covers usually round? (This was once a popular interview question asked of applicants at IBM, and there are at least three good answers. One good answer is sufficient here.)

4. Out-of-class activity Divide into groups of three or four students. In each group, develop an original procedure to illustrate the central limit theorem. The main objective is to show that when you randomly select samples from a population, the means of those samples tend to be *normally* distributed, regardless of the nature of the population distribution. For this illustration, begin with some population of values that does not have a normal distribution.

5. In-class activity Divide into groups of three or four students. Using a coin to simulate births, each individual group member should simulate 25 births and record the number of simulated girls. Combine all results from the group and record $n =$ total number of births and $x =$ number of girls. Given batches of n births, compute the mean and standard deviation for the number of girls. Is the simulated result unusual? Why or why not?

6. In-class activity Divide into groups of three or four students. Select a set of data from Appendix B (excluding Data Sets 1, 3, 6, 9, 10, 12, 14, 15, 16, and 20, which were used in examples or exercises in Section 6-6). Use the methods of Section 6-6 to construct a histogram and normal quantile plot, then determine whether the data set appears to come from a normally distributed population.