## 1-4 Basic Skills and Concepts

### Statistical Literacy and Critical Thinking

**1. Simple Random Sample** At a national conference of the American Appliances Association, a market researcher plans to conduct a survey of conference attendees. She uses the list of attendee names and selects every 20th name. Is the result a simple random sample? Why or why not? In general, what is a simple random sample?

**2. Observational Study and Experiment** You want to conduct a study to determine whether fruit consumption leads to reduced weight. Why would an experiment be better than an observational study?

**3. Simple Random Convenience Sample** A student of the author listed his adult friends, and then he surveyed a simple random sample of them. What is the population from which the simple random sample was selected? Are the results likely to be representative of the general population of adults in the United States? Why or why not?

**4. Convenience Sample** The author conducted a survey of the students in all of his classes. He asked the students to indicate whether they are left-handed or right-handed. Is this convenience sample likely to provide results that are typical of the population? Are the results likely to be good or bad? Does the quality of the results in this survey reflect the quality of convenience samples in general?

*In Exercises 5–8, determine whether the given description corresponds to an observational study or an experiment. In each case, give a brief explanation of your choice.*

**5. Contentious Survey** The Milgram Research Company wants to study reactions to stress, so it administers surveys in which the person asking the questions pretends to become very angry with the survey subject. At one point, the surveyor screams at the subject and asks how anyone could have such "stupid" opinions.

**6. Clinical Trial** In a clinical trial of the cholesterol drug Lipitor, 188 subjects were given 20-mg doses of the drug, and 3.7% of them experienced nausea (based on data from Pfizer, Inc.).

**7. Touch Therapy** Nine-year-old Emily Rosa was an author of an article in the *Journal of the American Medical Association* after she tested professional touch therapists. Using a cardboard partition, she held her hand above one of the therapist's hands, and the therapist was asked to identify the hand that Emily chose.

**8. Happiness Survey** In a study sponsored by Coca-Cola, 12,500 people were asked what contributes most to their happiness, and 77% of the respondents said that it was their family or partner.

*In Exercises 9–20, identify which of these types of sampling is used:* random, systematic, convenience, stratified, *or* cluster.

**9. Harry Potter** The author collected sample data by randomly selecting 12 different pages from *Harry Potter and the Sorcerer's Stone* and then finding the number of words in each sentence on each of those pages.

**10. Sexuality of Women** The sexuality of women was discussed in Shere Hite's book *Women and Love: A Cultural Revolution.* Her conclusions were based on sample data that consisted of 4500 mailed responses from 100,000 questionnaires that were sent to women.

**11. Twitter Poll** In a Pew Research Center poll, 1007 adults were called after their telephone numbers were randomly generated by a computer, and 85% of the respondents were able to correctly identify what Twitter is.