

## Section 1-4

1. No. Not every sample of the same size has the same chance of being selected. For example, the sample with the first two names has no chance of being selected. A simple random sample of  $n$  items is selected in such a way that every sample of the same size has the same chance of being selected.
3. The population consists of the adult friends on the list. The simple random sample is selected from the population of adult friends on the list, so the results are not likely to be representative of the much larger general population of adults in the United States.
5. Because the subjects are subjected to anger and confrontation, they are given a form of treatment, so this is an experiment, not an observational study.
7. This is an observational study because the therapists were not given any treatment. Their responses were observed.
9. Cluster      11. Random      13. Convenience
15. Systematic      17. Random      19. Convenience
21. The sample is not a simple random sample. Because every 1000th pill is selected, some samples have no chance of being selected. For example, a sample consisting of two consecutive pills has no chance of being selected, and this violates the requirement of a simple random sample.
23. The sample is a simple random sample. Every sample of size 500 has the same chance of being selected.
25. The sample is not a simple random sample. Not every sample has the same chance of being selected. For example, a sample that includes people who do not appear to be approachable has no chance of being selected.
27. Prospective study      29. Cross-sectional study
31. Matched pairs design      33. Completely randomized design
35. Blinding is a method whereby a subject (or a person who evaluates results) in an experiment does not know whether the subject is treated with the DNA vaccine or the adenoviral vector vaccine. It is important to use blinding so that results are not somehow distorted by knowledge of the particular treatment used.

## Chapter 1: Quick Quiz

1. No. The numbers do not measure or count anything.
2. Nominal      3. Continuous      4. Quantitative data
5. Ratio      6. False      7. No
8. Statistic      9. Observational study
10. False

## Chapter 1: Review Exercises

1. a. Discrete    b. Ratio    c. Stratified    d. Cluster  
e. The mailed responses would be a voluntary response sample, so those with strong opinions are more likely to respond. It is very possible that the results do not reflect the true opinions of the population of all customers.
2. The survey was sponsored by the American Laser Centers, and 24% said that the favorite body part is the face, which happens to be a body part often chosen for some type of laser treatment. The source is therefore questionable.
3. The sample is a voluntary response sample, so the results are questionable.

4. a. It uses a voluntary response sample, and those with special interests are more likely to respond, so it is very possible that the sample is not representative of the population.  
b. Because the statement refers to 72% of all Americans, it is a parameter (but it is probably based on a 72% rate from the sample, and the sample percentage is a statistic).  
c. Observational study
5. a. If they have no fat at all, they have 100% less than any other amount with fat, so the 125% figure cannot be correct.  
b. 686    c. 28%
6. The Gallup poll used randomly selected respondents, but the AOL poll used a voluntary response sample. Respondents in the AOL poll are more likely to participate if they have strong feelings about the candidates, and this group is not necessarily representative of the population. The results from the Gallup poll are more likely to reflect the true opinions of American voters.
7. Because there is only a 4% chance of getting the results by chance, the method appears to have statistical significance. The result of 112 girls in 200 births is above the approximately 50% rate expected by chance, but it does not appear to be high enough to have practical significance. Not many couples would bother with a procedure that raises the likelihood of a girl from 50% to 56%.
8. a. Random    b. Stratified    c. Nominal  
d. Statistic, because it is based on a sample.  
e. The mailed responses would be a voluntary response sample. Those with strong opinions about the topic would be more likely to respond, so it is very possible that the results would not reflect the true opinions of the population of all adults.
9. a. Systematic    b. Random    c. Cluster  
d. Stratified    e. Convenience
10. a. 780 adults    b. 23%  
c. Men: 48.5%; women: 51.5%  
d. No, although this is a subjective judgment.  
e. No, although this is a subjective judgment.

## Chapter 1: Cumulative Review Exercises

1. The mean is 11. Because the flight numbers are not measures or counts of anything, the result does not have meaning.
2. The mean is 101, and it is reasonably close to the population mean of 100.
3. 11.83 is an unusually high value.
4. 0.46      5. 1067      6. 0.0037
7. 28.0      8. 5.3      9. 0.00078364164
10. 68,719,476,736 (or about 68,719,476,000)
11. 678,223,072,849 (or about 678,223,070,000)
12. 0.0000059049

## Chapter 2 Answers

## Section 2-2

1. No. For each class, the frequency tells us how many values fall within the given range of values, but there is no way to determine the exact IQ scores represented in the class.
3. No. The sum of the percents is 199%, not 100%, so each respondent could answer "yes" to more than one category. The table does not show the distribution of a data set among all of several different categories. Instead, it shows responses to five separate questions.