Population and Sample Practice

1. For each statement, identify whether the numbers underlined are statistics or parameters.
   a. Of all U.S. kindergarten teachers, 32% say that knowing the alphabet is an essential skill.
   b. Of the 800 U.S. kindergarten teachers polled, 34% say that knowing the alphabet is an essential skill.

2. Of the U.S. adult population, 36% has an allergy. A sample of 1200 randomly selected adults resulted in 33.2% reporting an allergy.
   a. Who is the population?
   b. What is the sample?
   c. Identify the statistic and give its value.
   d. Identify the parameter and give its value.

3. In your own words, explain why the parameter is fixed and the statistic varies.

4. Select 90 students currently enrolled at NCSU and ask how many years they’ve attended the university, how old they are, and if they live on campus.
   a. What is the population?
   b. What is the sample?

5. Suppose a 12 year old asked you to explain the difference between a sample and a population, how would you explain it to him/her? How might you explain why you would want to take a sample, rather than surveying every member of the population?

6. In your own words, explain the difference between a statistic and a parameter.

7. A study reveals that there are exactly 100 Senators in the 109th Congress of the United States, and 55% of them are Republicans.
   a. Do the data comprise a sample or a population?
   b. Do the results represent a statistic or a parameter?

8. Identify the population and the sample:
   a. A survey of 1353 American households found that 18% of the households own a computer.
   b. A recent survey of 2625 elementary school children found that 28% of the children could be classified obese.
   c. The average weight of every sixth person entering the mall within a 3-hour period was 146 lb.

9. Determine whether the numerical value is a parameter or a statistic (and explain):
   a. A recent survey by the alumni of a major university indicated that the average salary of 10,000 of its 300,000 graduates was 125,000.
   b. The average salary of all assembly-line employees at a certain car manufacturer is $33,000.
   c. The average late fee for 360 credit card holders was found to be $56.75.
Population and Sample Practice ANSWER KEY

1. For each statement, identify whether the numbers underlined are statistics or parameters.
   a. Of all U.S. kindergarten teachers, 32% say that knowing the alphabet is an essential skill.
      Parameter (from the population)
   b. Of the 800 U.S. kindergarten teachers polled, 34% say that knowing the alphabet is an essential skill.
      Statistic (from the sample)

2. Of the U.S. adult population, 36% has an allergy. A sample of 1200 randomly selected adults resulted in 33.2% reporting an allergy.
   a. Who is the population?
      All US adults
   b. What is the sample?
      1200 randomly selected US adults
   c. Identify the statistic and give its value.
      \( \hat{p} = 0.332 \)
   d. Identify the parameter and give its value.
      \( p = 0.36 \)

3. In your own words, explain why the parameter is fixed and the statistic varies.
   The parameter comes from the population, and the population is set. The statistic is comes from the sample, and multiple samples can be taken from a population.

4. Select 90 students currently enrolled at NCSU and ask how many years they’ve attended the university, how old they are, and if they live on campus.
   a. What is the population?
      All currently enrolled students at NCSU
   b. What is the sample?
      90 students currently enrolled at NCSU

5. Suppose a 12 year old asked you to explain the difference between a sample and a population, how would you explain it to him/her? How might you explain why you would want to take a sample, rather than surveying every member of the population?
   A sample is a part of the population. Sometimes it is difficult to get the entire population, so a sample is a way to get a good idea of what the population looks like.

6. In your own words, explain the difference between a statistic and a parameter.
   A statistic is the numerical value taken from a sample (either a mean or proportion). The parameter is the numerical value taken from the population (either a mean or a proportion).

7. A study reveals that there are exactly 100 Senators in the 109th Congress of the United States, and 55% of them are Republicans.
   a. Do the data comprise a sample or a population?
      Population because it is all Senators
   b. Do the results represent a statistic or a parameter?
      Parameter (from the population)

8. Identify the population and the sample:
   a. A survey of 1353 American households found that 18% of the households own a computer.
      Population: All American households
Sample: 1353 American households

b. A recent survey of 2625 elementary school children found that 28% of the children could be classified obese.
   Population: All elementary school children
   Sample: 2625 elementary school children

c. The average weight of every sixth person entering the mall within a 3-hour period was 146 lb.
   Population: All people in the mall during the 3-hour period
   Sample: every 6th person entering the mall during the 3-hour period

9. Determine whether the numerical value is a parameter or a statistic (and explain):
   a. A recent survey by the alumni of a major university indicated that the average salary of 10,000 of its 300,000 graduates was 125,000.
      Statistic because it is from a sample
   b. The average salary of all assembly-line employees at a certain car manufacturer is $33,000.
      Parameter because it is from the population
   c. The average late fee for 360 credit card holders was found to be $56.75.
      Statistic because it is from a sample