1. In an observational study, we investigate the effects of certain conditions for a specific variable for each individual or object.

- **a.** True
- **b.** False

2. An appropriate sample is representative of the entire population of interest.

- **a.** True
- **b.** False

3. The Visniak Bottling Plant in Cheektowaga, New York, has been accused of systematically underfilling 12-ounce bottles of soda. An inspection team enters the plant one afternoon and selects bottled soda ready for shipment from various locations within the plant. The contents of each selected bottle are carefully measured.
This is an ___ study.

- experimental
- observational

The Visniak Bottling Plant in Cheektowaga, New York, has been accused of systematically underfilling 12-ounce bottles of soda. An inspection team enters the plant one afternoon and selects bottled soda ready for shipment from various locations within the plant. The contents of each selected bottle are carefully measured.

Identify the population and the sample in this study.

- Population: All bottles of soda; Sample: All 12-ounce bottles of soda
- Population: The bottles selected; Sample: All bottles of soda
- Population: The bottles selected; Sample: All 12-ounce bottles of soda
- Population: All 12-ounce bottles of soda; Sample: The bottles selected

---

The Visniak Bottling Plant in Cheektowaga, New York, has been accused of systematically underfilling 12-ounce bottles of soda. An inspection team enters the plant one afternoon and selects bottled soda ready for shipment from various locations within the plant. The contents of each selected bottle are carefully measured.

Identify the correct statement about the sample.

- This is not a random sample.
- This is likely a simple random sample.
- The sampling method is unclear.
- There is no way to determine if this is a simple random sample or not.

4. Electric and plug-in electric cars are designed to save gasoline and help the environment. In addition, there are certain tax credits for these types of hybrid automobiles. Although there are certainly benefits to owning a hybrid car, many people complain about the slow acceleration, repair expense, and overall comfort. Thirty-five passengers are randomly selected. Each is blindfolded and taken for a ride in a traditional combustion-engine automobile and in a comparably sized hybrid car (over the same route). The passenger is then asked to select the car with the most comfortable ride.

Select the correct option from the drop-down list.

This is an ___ study.

- observational
- experimental

Electric and plug-in electric cars are designed to save gasoline and help the environment. In addition, there are certain tax credits for these types of hybrid automobiles. Although there are certainly benefits to owning a hybrid car, many people complain about the slow acceleration, repair expense, and overall comfort. Thirty-five passengers are randomly selected. Each is blindfolded and taken for a ride in a traditional combustion-engine automobile and in a comparably sized hybrid car (over the same route). The passenger is then asked to select the car with the most comfortable ride.
What is the unit or population in this study?

- All car passengers.
- How comfortable hybrid and traditional combustion cars are for the passengers.
- The 35 passengers selected.
- All traditional combustion and hybrid cars.

Electric and plug-in electric cars are designed to save gasoline and help the environment. In addition, there are certain tax credits for these types of hybrid automobiles. Although there are certainly benefits to owning a hybrid car, many people complain about the slow acceleration, repair expense, and overall comfort. Thirty-five passengers are randomly selected. Each is blindfolded and taken for a ride in a traditional combustion-engine automobile and in a comparably sized hybrid car (over the same route). The passenger is then asked to select the car with the most comfortable ride.
What is the factor or treatment in this study?

- The type of car (hybrid or traditional combustion).
- The fact that the passengers were blindfolded.
- The 35 passengers
- How comfortable the ride is.

Electric and plug-in electric cars are designed to save gasoline and help the environment. In addition, there are certain tax credits for these types of hybrid automobiles. Although there are certainly benefits to owning a hybrid car, many people complain about the slow acceleration, repair expense, and overall comfort. Thirty-five passengers are randomly selected. Each is blindfolded and taken for a ride in a traditional combustion-engine automobile and in a comparably sized hybrid car (over the same route). The passenger is then asked to select the car with the most comfortable ride.
What is the outcome of this study?

- The car with better fuel economy.
- The type of car (hybrid or traditional combustion).
- The car that offers more comfortable ride.
- The car with faster acceleration.

5. You are planning a study and are considering taking an SRS of either 300 or 700 observations. Explain how the sampling distribution would differ for these two scenarios.

- The larger sample would have a center closer to the true population parameter.
- The larger sample would have less sampling variability.
- The smaller sample would have less sampling variability.
- The statistics of the smaller sample have more chance for bias than those of the larger sample.

6. Do consumers prefer the fries from Burger King or from McDonalds? To investigate this question, you are required to design a blind test in which neither source of the fries is identified.
Identify the appropriate matched pairs experiment to investigate this question.

- Each subject should taste both kinds of fries (unlabeled) in a randomly selected order and then be asked about preference.
- Each subject should taste, one of the two, randomly chosen fries (unlabeled) and then be asked about their opinion about the taste of the fries.
- Each subject should taste the fries that are labeled as being from Burger King or McDonalds in a randomly selected order and then be asked about preference.
- Half of the subjects should taste fries from Burger King and other half should taste fries from McDonalds (unlabeled) and then be asked about their opinion about the taste of the fries.

7. Please match the following studies with the type of sampling design.

____ **1.** A study to compare two methods of preserving wood started with boards of southern white pine. Each board was ripped from end to end to form two edge-matched specimens. One was assigned to Method A; the other to Method B.

____ **2.** A survey on youth and smoking contacted by telephone 300 smokers and 300 nonsmokers, all 14 to 22 years of age.

____ **3.** Does air pollution induce DNA mutations in mice? Starting with 40 male and 40 female mice, 20 of each sex were housed in a polluted industrial area downwind from a steel mill. The other 20 of each sex were housed at an unpolluted rural location 30 kilometers away.

____ **4.** Does the age and gender of a person affect the number of accidents? An investigator looked at 100 men between the ages of 17 and 21 and 100 women between the ages of 17 and 21 and looked at the number of accidents that each had.

a. Stratified random sample

b. SRS

c. matched pair design

d. block design