

Experimental Design Class Work (Sampling Techniques)

📖 **Objective:** You will be able to understand statistics as a process for making inferences, and recognize the purposes for and differences among sampling techniques.

☆ **I am an expert on this sampling technique:**

☆ **The other sampling techniques are:**

☆	☆
☆	☆

Study your assigned sampling technique. Take note of the most important aspects, including key words of the definition, and some sort of example in the "I am an expert on" box. See if you can create your own example too! In about five minutes, we will form groups in such a way that you can teach others about your sampling technique and learn about other sampling techniques.

A. Random Sampling:

- Every member of the population has an equal chance of being selected
 - Carried out by assigning random numbers to every member of the population, and then using a random number table or a random number generator to choose the sample from which responses, measures, characteristics, etc. will be recorded
 - Example: Eight students from your school are chosen at random to complete a survey about what clubs they are in
 - Another example: A telephone survey is conducted by randomly dialing 1000 phone numbers.
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B. Simple Random Sampling:

- Every sample of the same size has an equal chance of being selected.
 - Carried out by assigning random numbers to every member of the population, and then using a random number table or a random number generator to choose the sample from which responses, measures, characteristics, etc. will be recorded
 - Example: Eight students from your school are chosen at random to complete a survey about what clubs they are in. Your school is unique because there are exactly 200 freshman, 200 sophomores, 200 juniors, and 200 seniors.
 - Another example: A telephone survey is conducted by randomly dialing 1000 phone numbers, choosing from 500 phone numbers that have a 908 area code, 500 phone numbers that have a 732 area code, and 500 phone numbers that have a 718 area code.
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C. Stratified Sampling:

- Used when it is important to have members from each segment of the population
- Members of the population are divided into subsets, called strata, that share a common characteristic such as age, gender, ethnicity, location, political preference, etc. Then, a sample is selected from each of the strata
- Example: To collect a stratified sample of the amount of water each household uses in a certain county, you can stratify the houses in the county according to how many people live in each house. Then, you can choose 10 houses from the group of single residencies, 10 houses from the group of houses where two people live, 10 houses from the group of houses where three people live, etc.
- Another example: You may survey eight people at your high school about what clubs they are involved in, specifically choosing one male and one female at random from each grade level.

Name: _____ Date: _____ **Unit 2 Class Work**

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D. Cluster Sampling:

- In order to create a cluster sample, the population must naturally fall into subgroups, or clusters (such as students in a middle school are 5th graders, 6th graders, 7th graders, or 8th graders). Then you would select members from one or more, but not all, of the clusters. For example, you may only choose to survey 5th and 8th graders in a middle school.
- Another example of cluster sampling may be to consider all students enrolled in College Prep Algebra II at Cranford High School. If there are five sections of this course, and you only survey students from three of these sections, then the sampling technique you use will be considered cluster sampling.

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E. Systematic Sampling:

- When using systematic sampling, the population is placed in some order, and the sample is collected in an interval-style manner. For example, the speed of every third car who passes a police officer watching the road may be recorded.
- Another example would be to select every 5th person who enters Lord & Taylor and ask whether they are shopping for themselves, for someone else, or both.

Write & Share

What is the difference between taking a census and taking a sample, and when would you prefer to use each?

Choose Option A, B, or C! 😊

Option A

Choose any sampling technique, and create a hypothetical situation in which that sampling technique is used.

Option B

Write any questions you have regarding sampling techniques.

Option C

Choose any sampling technique, and describe when it is best to use that technique.

★ **Convenience Sampling:** A sample is chosen at one's convenience.

Ex. A researcher only surveys people who actually come into her office.

Another example:

*Do convince surveys often result in biased results?! _____

 **Practice!**

Identify the sampling technique applied, mention any potential sources of bias, & provide reasoning.

1. Black beans are planted on a 52-acre field, which is divided into subplots that are each four-acres. A sample of beans is taken from 10 subplots to analyze the harvest.

2. A survey of fifth and sixth graders is conducted in a school at which there are six fifth grade classrooms and six sixth grade classrooms. Twenty students from these classes are chosen at random and their standardized test scores are recorded.

3. Fifty random people living in New York City and fifty random people living in Berkley Heights, NJ are chosen to be part of a study analyzing public transportation habits.

4. Every 7th customer at a pizzeria is observed to see whether he/she pays with cash, check, or credit card.

5. One-hundred-and-twenty people living in a small city are surveyed in regards to how they feel about the cleanliness of the town park. Twenty people from each age group (0-15 years old, 15-30 years old, 30-45 years old, 45-60 years old, 60-75 years old, and 75-100 years old) are chosen, 10 females and 10 males from each. Assume no one in the town is over 100 years old, unfortunately.

6. Sasha asks six of her friends which local band is their favorite, so that she can choose a band to perform at her high school.