



7th
Basic

8th
Advanced

Helping With Math

USA
GRADES

Sampling Techniques

Suitable for students
aged 11-13

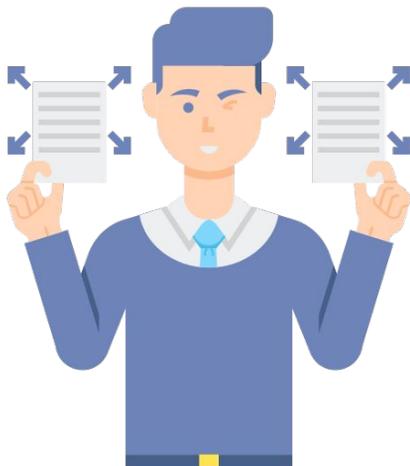


This pack is suitable for learners aged 11-13 years old or 7th to 8th graders (USA). The content covers fact files and relevant basic and advanced activities involving sampling techniques.

Sampling technique is a process of selecting people or a subset of the given population. It is done to make inferences and characterize the whole population.



Population is the totality of all individuals who share common features. The subset of the population or a specific group of people is called the sample.



- Sampling technique plays an important role in research.
- It is a part of a research work which requires thorough preparation and planning.
- Researchers do not just select a group of people without basis.
- Selecting inappropriate sample will reflect in the final results of the study.



TYPES OF SAMPLING

Probability Sampling

It is a sampling method that utilizes a random selection. Each individual or element is given an equal chance of being selected as a sample.

Non-Probability Sampling

It is also known as the non-random sampling where not all elements of the population has a chance of being selected as a sample.



TYPES OF PROBABILITY SAMPLING

Simple Random Sampling

Every element is selected randomly and has an equal chance. Tools like random generators or the like can be used.

Stratified Random Sampling

Sample is selected by dividing the group into small subgroups (strata) based on the common characteristics and sample is selected from the strata.



Systematic Sampling

Every element is selected randomly from a starting point and then select every n th element in the population or a regular interval.

Cluster Random Sampling

This technique divides the population into groups called clusters and randomly selects members from the groups or clusters.



TYPES OF NON-PROBABILITY SAMPLING

Convenience Sampling

Sample is selected based on what is available or the convenience of the researcher.

Consecutive Sampling

This technique is more like a convenience sample but with little difference. In this method, the researcher will choose a person or group of people, conduct a research and collect results for a period of time, and will move to another sample.

Purposive Sampling

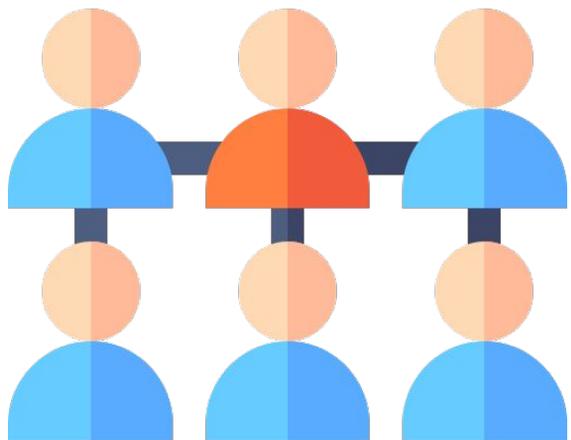
The samples in purposive sampling is selected based on the discretion or knowledge of the researcher and based on the objective of the study. This is also known as the judgmental, selective, or subjective sampling.

Snowball Sampling

This technique is also known as the chain-referral sampling technique. Snowball is used to select samples which have traits that are hard to find. Existing subjects in the population are asked to recruit more sample units which have the same traits of the targeted population.

Quota Sampling

In this technique, the researcher selects the sample based on specific attributes or traits. They decide and make quotas so that the sample will be useful to the research.



EXAMPLE

Simple Random Sampling

Suppose you want to select a random sample of 100 students from a University. We can assign a number to each student using a number generator to select the sample.



Stratified Random Sampling

For example, you have a group of 50 male and 50 female students and you want to proportionally select samples from each group (strata), i.e., 10 from male and 20 from female.

Systematic Sampling

Suppose that you will have an oral recitation and your teacher wants to select every 5th student from the names listed alphabetically starting from the first student in the list.

Cluster Random Sampling

Suppose that you need to interview some voters in your district during the election but you cannot go to 15 different precincts to collect information. Hence, you can randomly select 7 or 8 precincts as clusters.



EXAMPLE

Convenience Sampling

Suppose you want to know the satisfaction rate of your customers in your restaurant in specific area. You ask your few customers to complete a questionnaire after they ordered and dined for specific food or meal. Here, the selection of sample is very convenient because the sample is not a representation of all the customers in that region.



Consecutive Sampling

A credit card agent is giving a flyer to the people walking in the mall. The people are the samples or representative of the population. Let's say some of them stayed and answered the questions of the agent. If the responses of those people were collected and analyzed and were inconclusive, the agent asks questions to another group who showed interest in acquiring a credit card..



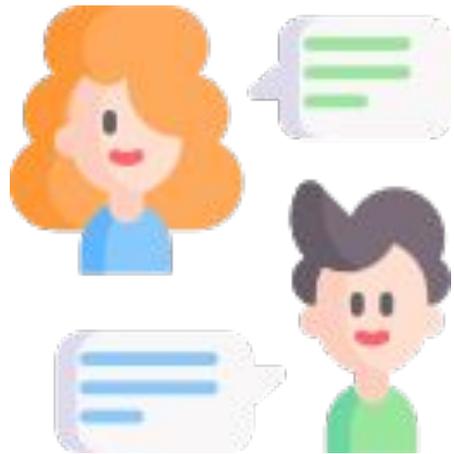
EXAMPLE

Purposive Sampling

Suppose a researcher wants to know the perception of students about studying architecture. The selection of the sample be start by asking the question, “Are you taking architecture?” and students who responded no will not be included in the sample.

Snowball Sampling

People with rare disease are difficult to find. For example, people with HIV. Not all HIV positive people are ready to respond to or answer the questions about it. Thus, the researcher can still find ways to find samples by asking them if they know other people who have the same case as them.



Quota Sampling

A researcher want to conduct a survey about what brand of shoes they prefer to buy. The researcher considers a sample of 400 participants and only wants to survey 10 streets in New York City. He/She sets quotas of the ages such as 16-20, 21-30, 31-40, 40+ or 10 people per street.



TABLE OF ACTIVITIES

Ages 11-12 (Basic)		<u>7th Grade</u>
1	What's the Difference?	
2	Mean the Mishmash	
3	Name the Sampling Technique	
4	A True Researcher	
5	The Right Technique	
Ages 12-13 (Advanced)		<u>8th Grade</u>
6	The Researcher's Pairs	
7	It's the Best	
8	The Samples	
9	On Your Own	
10	The Why's	



WHAT'S THE DIFFERENCE?

G7
Basic

To start a research work, Mr. Davis needs to differentiate first a population from a sample. Help him remember it by giving what is asked below.

1.



10 books in library

Population: _____



All books in library

Sample: _____

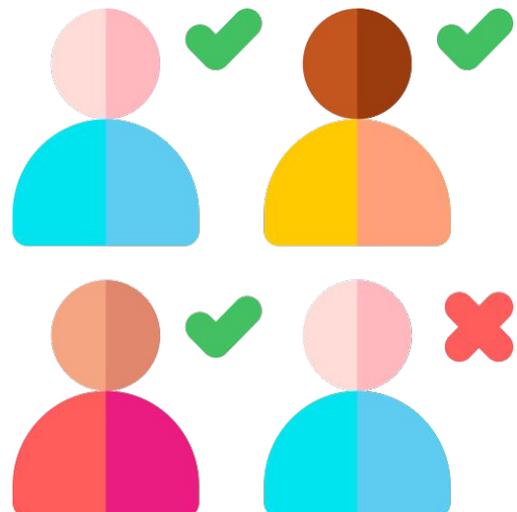
2. A survey of 3512 middle school children found that 27% of them could be classified as advanced learners. Is it a population or sample?

3. The average height of every person entering the fashion boutique in a city within 4 hours was 5'5 feet. Is it a population or sample?

4. Select 100 students currently enrolled Harvard University and ask how old they are, and if they live nearby.

Population: _____

Sample: _____



MEAN THE MISHMASH

G7
Basic

One of the characteristics of a researcher is a being able to figure out things easily. Given the jumbled letters, come up with a sampling technique and then define.

EOPIRVPSU



ADIISTTEFR



ECNNVEENCOI



ESSCTMTIAY



NAME THE SAMPLING TECHNIQUE

G7
Basic

As a researcher, it is important to know the sampling techniques before you proceed to your study. Read the statements carefully and identify what is being asked.

1. It is a probability sampling technique where the population is being divided into subgroups with common characteristics.

2. It is a probability sampling technique which usually utilizes a number generator to select random members of the population.

3. It is a non-probability sampling technique where the researcher is selecting what is readily available.

4. In this sampling technique, samples are selected at random following a certain pattern.

5. Samples in this sampling technique are usually hard to locate or find.

6. This is a non-probability sampling that is based on the characteristics of a population and samples are selected based on the objective of the study.

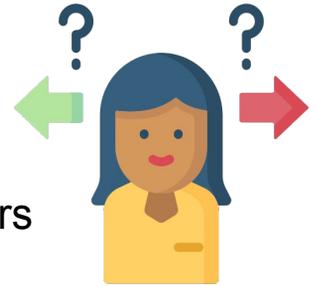


A TRUE RESEARCHER

G7
Basic

If you are a true researcher, you can tell which of the following statements are correct. If not, make the statement correct.

1. Sampling is a subset of a population.



2. In probability sampling, all elements or members of the population don't have equal chances of being selected as samples.

3. Cluster sampling is an example of probability sampling technique.

4. Numbers 1 - 10 are assigned to 10 students in a class and the teacher picks a number for recitation, this technique is a simple random sampling.

5. In consecutive sampling, the researchers decide and make quotas so that the sample will be useful to the research.



THE RIGHT TECHNIQUE

G7
Basic

As a researcher, choosing a sample is one of the important parts of research. Identifying the best sampling technique is also important. Tell what type of sampling technique is applied to each situation.

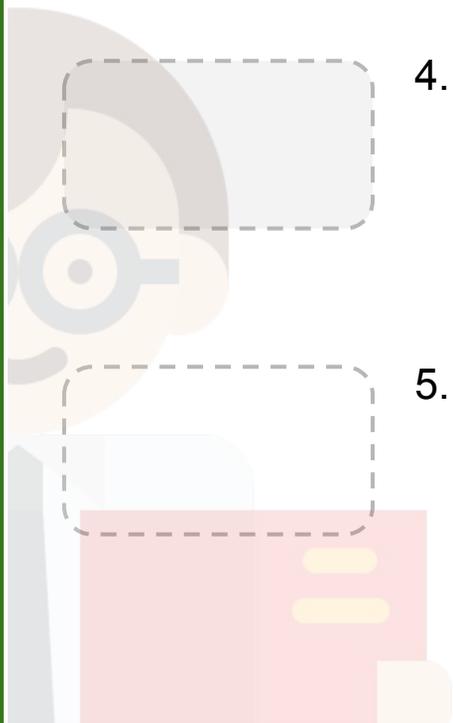
1. Mr. Davis samples her class by selecting every fourth person on his class list.
- A. Simple
B. Stratified
C. Systematic
D. Cluster

2. Mr. Davis samples his class by selecting 12 years old and 13 years old.
- A. Simple
B. Stratified
C. Systematic
D. Cluster

3. Mr. Davis samples his class by selecting all the students in team A and team C.
- A. Simple
B. Stratified
C. Systematic
D. Cluster

4. Mr. Davis randomly picks 15 students in his class using a hat with numbers 1 to 15 to clean the classroom.
- A. Simple
B. Stratified
C. Systematic
D. Cluster

5. Mr. Davis surveyed all students in the classroom to get results immediately.
- A. Purposive
B. Quota
C. Convenience
D. Snowball



THE RESEARCHER'S PAIRS

G8

Basic

Match each given situation to the sampling techniques given. Researchers can perfectly pair these. Try it!



1. A school surveyed 600 of its students. They were selected proportionally based on the number of students enrolled in each master's degree program.

A.
Quota
Sampling



2. The researcher interviews people who have watched a movie. He interviews every 5th person coming out from the cinema.

B.
Systematic
Sampling



3. Professor James is looking for a group of homeless people. He interviewed one from a city and told him that he knows more homeless people.

C.
Snowball
Sampling



4. A researcher told interview students. He divided them according to gender and age. He interviewed 20 male students between the age of 25 and 40.

D.
Purposive
Sampling



5. A researcher is looking for students who have interest in Mathematics subject. He went to the college of Mathematics to interview.

E.
Stratified
Sampling



IT'S THE BEST

G8
Basic

You already know that choosing the appropriate sample affects the results of the research. If you are the researcher, identify what best sampling technique should be applied to each given situation. Justify your answer.

1. A charity gives a hospital \$1000 to spend on the patients. The staff will make a survey to identify where to spend the money.
 - A. ask the doctors and the nurses
 - B. ask vendors nearby the hospital
 - C. randomly select 10 patients per day

2. To determine what employees at your company think about having a pantry inside the office.
 - A. ask everyone in the office
 - B. ask the maintenance team
 - C. ask the manager or head in each office

3. Determine the most watched cartoon shows.
 - A. ask all the mothers in a street
 - B. ask students in school aged 7 to 9
 - C. call all the maids at a household



THE SAMPLES

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Basic

Mr. Davis, a professor and a researcher, asks his students to give an example for each sampling technique before they choose their samples for their research work.

Cluster Random Sampling



Cluster Random Sampling



Convenience Sampling



Stratified Random Sampling



ON YOUR OWN

G8
Basic

While Mr. Davis' students are busy working with their task, he also thought of the following questions and shared his answers to his students. If you are Mr. Davis, how would you answer these questions.

Why are samples used in research?



Of the probability sampling techniques, which seems strongest to you? Which seems weakest? Explain.



How do we choose a sampling technique?

What is sampling bias? Why does it matter?



THE WHYS

G8
Basic

Mr. Davis asked their students to go to the library to find researches and tell what sampling technique was used and why. Here are the researches they found.

1. Study on effectiveness and tolerance of pre-and postoperative radiochemotherapy for patients with stomach cancer.

Part of the abstract

Postoperative radiochemotherapy was included to the therapeutic scheme of stomach cancer. The effectiveness and tolerance of pre- and postoperative radiochemotherapy were studied. A Range Scale Risk reflecting the risk of treatment failure , selecting patients with bad prognosis to intensive therapy was established on the base of identified predictive and prognostic factors. 426 patients with stomach cancer were undergone radiochemotherapy between 1999 and 2005.

Identify what sampling technique was used and why.



Source: Wydmanski, J. (2008). Study on effectiveness and tolerance of pre-and postoperative radiochemotherapy for patients with stomach cancer[D.Sc. Thesis]; Zbadanie skuteczności i tolerancji przedoperacyjnej i pooperacyjnej radiochemoterapii u chorych na raka żołądka. Nowotwory, 58. <https://www.osti.gov/etdeweb/biblio/21198816>



ANSWER GUIDE

Activity 1

- 1.) Population: All books in library Sample: 10 books in library
- 2.) Population
- 3.) Sample
- 4.) Population: All students currently in Harvard University
Sample: 100 students enrolled in Harvard University

Activity 2

- 1.) Purposive Sampling
- 2.) Stratified Random Sampling
- 3.) Convenience Sampling
- 4.) Systematic Sampling

Activity 3

- 1.) Stratified Random Sampling
- 2.) Simple Random Sampling
- 3.) Convenience Sampling
- 4.) Systematic Sampling
- 5.) Snowball Sampling
- 6.) Purposive Sampling

Activity 4

- 1.) Sample
- 2.) non-probability sampling
- 3.) True
- 4.) True
- 5.) quota sampling

Activity 5

- 1.) C
- 2.) B
- 3.) D
- 4.) A
- 5.) C



ANSWER GUIDE

Activity 6

1.) E

2.) B

3.) C

4.) A

5.) D

Activity 7

1.) C

2.) A

3.) B

Answers may vary in the explanation

Activity 8

Answers may vary.

Activity 9

Answers may vary.

Activity 10

Answers may vary.



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