Sampling methodology

Mana Maths

Te reo Māori terms

tikanga
methodology
Open in Te Aka

noa
random
Open in Te Aka

nahanaha
systematic
Open in Te Aka

whakarōpū
stratified
Open in Te Aka

Sampling methodology — Foundation

1. Which sampling method gives every person in the population an equal chance of being chosen?

2. A teacher asks the first 10 students who walk into class. Is this random sampling?

3. A survey is posted on one gaming website. Does this give a fair sample of all teenagers? Why not?

4. Match the method to the description: random, systematic, or convenience. Taking every 5th name on a list is _____ sampling.

5. Taking the easiest people to ask is called _____ sampling.

6. Choosing names from a hat is an example of _____ sampling.

7. A school wants student opinions from all year levels. Why might asking only Year 9 students be unfair?

8. A population has 60% girls and 40% boys. Which method tries to keep those same proportions in the sample?

9. In systematic sampling, if you start at the 3rd name and take every 4th name, what is the next name chosen after 3?

10. A sample only includes students from the football team. Is this likely to be biased?

11. Why is a larger sample usually better than a very small sample?

12. A researcher wants to know favourite lunch food in the whole school. Give one place where surveying only there could cause bias.

13. If a survey only includes people who choose to reply, what problem might this create?

14. Write one reason why stratified sampling can be fairer than convenience sampling.

Sampling methodology — Proficient

1. Compare these methods for a canteen survey: the first 20 students seen at lunch, or 20 names chosen randomly from the roll.

2. A list has students numbered 1 to 120. Start at 4 and take every 10th student. Write the first four numbers chosen.

3. A town survey wants each age group represented in the same proportions as the population. Which sampling method suits this best?

4. A survey about bus travel is taken only at a bus stop. Explain the bias.

5. Convenience sampling is fast. Give one advantage and one disadvantage.

6. A school has 500 juniors and 300 seniors. For a stratified sample of 40, how many juniors and seniors should be chosen?

7. A class surveys homework time using volunteers only. Why could this be biased?

8. A researcher chooses every 8th customer entering a store. Name this method and give one way it could still be unfair.

9. Why can one simple random sample give a different result from another?

10. A population has city and rural households, but the sample has only city households. What is wrong with the methodology?

11. Give one situation where stratified sampling is better than simple random sampling.

12. Why can a well-chosen sample of 200 be more trustworthy than a badly chosen sample of 500?

Sampling methodology — Excellence

1. A principal wants to estimate support for a new uniform. Compare surveying students outside the uniform shop with a stratified random sample across year levels.

2. Explain the difference between a large sample and a representative sample.

3. A population is 55% juniors and 45% seniors. Design a stratified sample of size 60.

4. A screen-time survey is sent through the school e-sports club only. Give one criticism using selection bias.

5. A researcher takes every 20th name from an alphabetical roll. Give one strength and one weakness of this method.

6. Two surveys both use 100 people. One is random across the town. The other uses 100 shoppers from one mall at midday. Which is stronger? Why?

7. A sports survey includes 30 basketball players, 25 netball players, and only 2 students who do no sport. Why might this be unrepresentative?

8. A researcher says, “My sample is big, so it must be fair.” Explain why that does not always follow.

9. A company wants opinions on a new app from teenagers and adults. Why might stratifying by age help?

10. One sample is random but too small. Another is larger but clearly biased. Which problem is harder to fix later? Explain.

11. A town has 40% urban, 35% suburban, and 25% rural households. For a stratified sample of 200, how many come from each group?

12. A researcher chooses every 10th customer from a list arranged by membership type. Why could this be biased?

13. Why do volunteer surveys often over-represent people with strong opinions?

14. Recommend a good sampling methodology for estimating travel-to-school patterns across a whole school.

15. A survey uses a perfect random method, but half the selected people refuse to answer. What new concern does this create?

16. Give an example where a cluster-like convenience sample could be useful, but risky for generalising.