

6.1.3 Statistical Samples

Name: _____ Class: _____ Date: _____

KEY WORDS population

<!-- Session 2 native-skill companion -->

Objective

Practise statistical samples within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Samples, populations and justified comparisons · Foundation

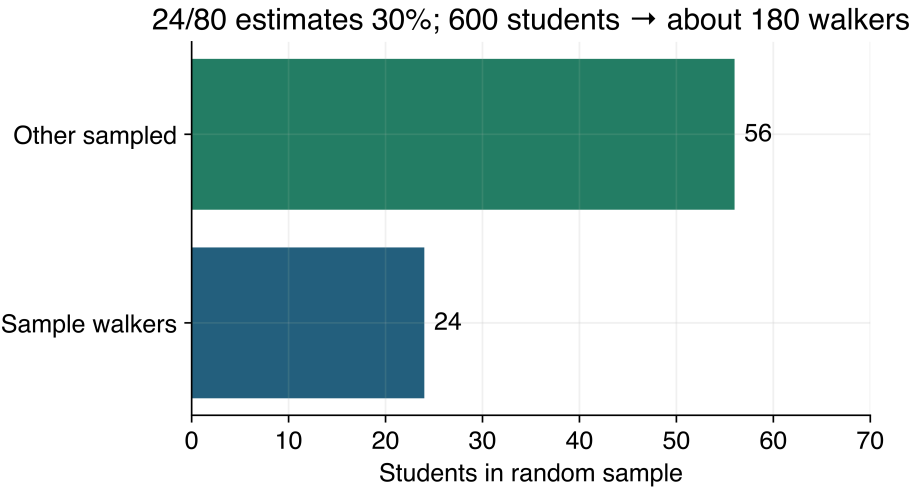
Define the target population and variables before sampling. A sample is a subset; a census includes the whole population. Random selection reduces systematic selection bias but does not eliminate sampling variability or non-response. Primary data is collected for the present investigation; secondary data was collected by another source or purpose. Discrete data is counted; continuous data is measured.

$$\hat{N} = N \frac{f}{n}$$

In a random sample of 80 students, 24 walk to school, so the observed proportion is 24/80=0.3. Applied to a school of 600 it suggests about 180 walkers, with sampling uncertainty: it is an estimate rather than an exact count. A sports-club convenience sample may overrepresent active students. A voluntary online poll can miss people who do not respond; adding responses does not necessarily remove that bias. A study should record who could be selected, missing responses and the question wording. Number of siblings is discrete; travel time is continuous even if recorded to whole minutes. A school's published attendance records are secondary data for a new project; measuring new travel times produces primary data.

Sample size alone cannot fix biased selection. A precise calculated estimate need not be accurate for the target population. Recording continuous measurements as integers does not change the underlying variable type.

AQA S1/S4/S5 uses samples to describe populations and recognises limitations/data types. State what the sample supports and what might make extrapolating to the whole population unreliable.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find the sample walker proportion for 24 of 80.

2.2 (Foundation) Estimate walkers in a population of 600 from this proportion.

2.3 (Foundation) Find non-walkers in the sample.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: A sample result gives an exact population count whenever the arithmetic is correct.

Solutions

2.1 $24/80=0.3$.

2.2 $600 \times 0.3 = 180$.

2.3 $80 - 24 = 56$.

3.1 False. A sample with 24 walkers out of 80 estimates 30%; applying it to 600 estimates 180 walkers. The unobserved people may have a different proportion, so arithmetic correctness does not remove sampling uncertainty.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.