

GCSE - Numeracy and Mathematics

Tier: Intermediate

Grade: C/D



Topic: Effects and methods of sampling (including systematic sampling)

Starter

Decide whether we should use a sample in the following scenarios or not?

(a) Carwyn would like to know what his classmates' favourite colour is.

(b) Eleri would like to discover how many times people living in Wales exercise every week.

Top Tips!

Stratified sampling

For stratified sampling, the population is divided into groups which have something in common e.g. school year groups.

Random sampling

For a random sample, every member of the population has an equal chance of being selected.

Systematic sampling

Systematic sampling means taking one item from a list at regular fixed intervals e.g. every 5th, every 20th, etc.

Skills:

An international organisation employs people in Australia, Belgium, Canada, Denmark and Ecuador. The number of people employed by the organisation in each country is given in the following table.

Country	Number of employees
Australia	5243
Belgium	1004
Canada	8745
Denmark	545
Ecuador	762

The organisation is arranging a charity event and decides to invite 25 employees to represent the employees in the five countries.

Use a stratified sampling method to calculate how many people from each country should be invited to the charity event.

Examination Question: June 1996 Linear Higher (Q4 P131 guidelines)

The governors of a school are planning to open the school swimming pool for public use at certain times when the school is closed. They want to know how many pupils and their families are prepared to pay to use the pool if it is open at weekends and during the school holidays. They have prepared a questionnaire on the subject for pupils to take home and complete with their families and want to select a sample of pupils for this purpose.

Write down a factor that you think they should take into account when constructing a stratified sample for this survey, explaining why you have chosen that factor. [2]

Assessment for Learning

Video / QR code



Starter

Decide whether we should use a sample in the following scenarios or not?

(a) Carwyn would like to know what his classmates' favourite colour is.

Carwyn should not use a sample – it would be reasonable to ask all of his classmates.

(b) Eleri would like to discover how many times people living in Wales exercise every week.

Eleri should use a sample – she cannot possibly ask everyone in the country.

Top Tips!

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Use a stratified sampling method to calculate how many people from each country should be invited to the charity event.

Total = 16299

$$\text{Australia} = \frac{5243}{16299} \times 25 = 8.04... = 8$$

Belgium = ... = 2, Canada = ... = 13, Denmark = ... = 1, Ecuador = ... = 1

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Write down a factor that you think they should take into account when constructing a stratified sample for this survey, explaining why you have chosen that factor. [2]

Valid factor e.g. consider all year groups, avoid siblings.

Valid reason e.g. need to get a fair representation of all year groups, avoid bias.