GCSE Maths: Sampling and population estimates (Foundation): worksheet

GCSE Maths - Statistics - Foundation - Lesson 24.2

Name: _____ Date: _____ Score: _____

12 questions. Write your answers in the spaces. Answers and step-by-step help are free at **websink.site/gcse/maths/ch24-statistics/foundation/sampling-and-population-estimates/**

Exercise 24B Sampling and population estimates (Non-calculator)

1 **For each situation, say what the population is and what the sample is.**

(a)

A teacher asks 20 students in Year 10 whether they like the canteen food. There are 180 students in Year 10.

Answer:

(b) A factory tests 50 light bulbs from a batch of 2000 bulbs.

Answer:

2 **Give two reasons why a sample is used instead of asking the whole population.**

Answer:

3 **Mia wants to find out how often people in her town use the bus. She asks the first 20 people she meets at the bus station. Explain why this sample may be biased.**

Answer:

4 **Which of these is a random sample of 10 students from a school? A: the first 10 students to arrive on Monday. B: 10 students chosen by a computer from the full school list. C: the 10 students in the school football team.**

Answer:

5 **In each case a random sample is taken. Estimate the number in the population who have the property.**

(a)

A random sample of 40 pupils from a school of 800: 10 are left-handed. How many left-handed pupils are there likely to be in the school?

Answer:

(b)

A random sample of 60 batteries from a batch of 3000: 3 are faulty. How many faulty batteries are there likely to be in the batch?

Answer:

(c) A random sample of 25 customers from 400 customers: 9 prefer tea. How many prefer tea?

Answer:

6 **A wildlife officer marks animals, releases them, and later catches a second sample. Estimate the population each time.**

(a) Marked first: 30. Second sample: 40. Marked in the second sample: 6.

Answer:

(b) Marked first: 50. Second sample: 60. Marked in the second sample: 10.

Answer:

(c) Marked first: 24. Second sample: 50. Marked in the second sample: 8.

Answer:

7 **In a lake, 120 fish are caught, tagged and returned. A week later, 150 fish are caught and 25 of them have tags. (a) Estimate the number of fish in the lake. (b) Give one assumption you made.**

(a) Estimate the number of fish

Answer:

(b) One assumption

Answer:

8 **A school has the numbers of students shown. Work out how many students from each group should be in each stratified sample.**

(a) Year 7: 90, Year 8: 60, Year 9: 150. Sample of 20.

Answer:

(b) Boys: 240, Girls: 160. Sample of 50.

Answer:

(c) Year 10: 125, Year 11: 100, Sixth form: 75. Sample of 60.

Answer:

9 **A club has 124 juniors, 96 seniors and 80 veterans. A stratified sample of 30 members is taken. How many members of each group are in the sample? Round to the nearest whole number.**

Answer:

10 **Ben says: “In a stratified sample, you must take the same number from every group.” Explain why Ben is wrong.**

Answer:

11 **A scientist says: “My population estimate from capture–recapture may be too high because some of the marked animals died before the second sample was taken.” Explain whether she is right.**

Answer:

12 **Zoe marks 40 deer and later catches 30, of which 5 are marked, giving an estimate of 240. Her friend takes a bigger second sample of 90 and finds 14 marked. Work out the second estimate, then say which estimate you would trust more and why.**

Answer:

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