Sampling and population size

Biology calculations | AQA Combined Science 8464 and AQA GCSE Biology 8461 | 12 questions, 38 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- mean = $\frac{\text{sum of values}}{\text{number of values}}$ learn this one
- estimated population = mean number per quadrat × $\frac{\text{total area}}{\text{area of one quadrat}}$ learn this one
- percentage cover = $\frac{\text{area covered}}{\text{area of quadrat}}$ × 100 learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 38**

1 Hamza places 10 quadrats at random on a school field. He counts the daisies in each one.

Quadrat	1	2	3	4	5	6	7	8	9	10
Daisies	4	7	2	0	5	6	3	8	1	4

Calculate the mean number of daisies per quadrat.

(2 marks)

Answer _____

2 Zainab counts the snails in 11 quadrats in a woodland.

2, 6, 3, 6, 1, 4, 8, 6, 5, 0, 3

a. Find the median number of snails.

b. Find the mode.

(2 marks)

Answer _____

3 A meadow has an area of 400 m^2. Jessica uses 12 quadrats, each with an area of 1 m^2. She finds a mean of 3.5 buttercups per quadrat.

Estimate the number of buttercups in the meadow.

(2 marks)

Answer _____

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4 A park lawn has an area of 600 m^2. Oscar uses a square quadrat with sides of 50 cm. He finds a mean of 2.4 dandelions per quadrat.

Estimate the number of dandelions on the lawn.

(3 marks)

Answer _____

5 A rectangular field is 30 m long and 45 m wide. Leah places six quadrats, each 0.5 m by 0.5 m, and counts the clover plants.

5, 3, 0, 4, 2, 4

Estimate the number of clover plants in the field.

Show your working.

(4 marks)

Answer _____

6 Lucas places a square quadrat with sides of 50 cm on a lawn. Moss covers 600 cm^2 of the area inside the quadrat.

Calculate the percentage cover of moss in this quadrat.

(3 marks)

Answer _____

7 A nature reserve warden estimates there are 3000 orchids in a 1500 m^2 meadow. She used 1 m^2 quadrats.

Calculate the mean number of orchids per quadrat she must have found.

(2 marks)

Answer _____

8 A council ecologist estimates there are 4500 bluebells in a woodland clearing. She found a mean of 1.8 bluebells per quadrat, and each quadrat has an area of 0.25 m^2.

Calculate the area of the clearing.

(3 marks)

Answer _____

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9 Jun places 20 quadrats, each 0.25 m^2, on a 250 m^2 bank beside a canal. He counts 64 primrose plants altogether.

Estimate the number of primrose plants on the bank.

Show your working.

(3 marks)

Answer _____

10 A Year 10 class compares the number of daisies in an open area and a shaded area of a school field. Each area is 80 m^2. They use quadrats measuring 0.5 m by 0.5 m.

Quadrat	**1**	**2**	**3**	**4**	**5**
Open area	6	9	7	8	10
Shaded area	2	3	1	4	0

a. Estimate the number of daisies in the open area.

b. Estimate the number of daisies in the shaded area.

c. Calculate how many more daisies there are in the open area than the shaded area.

Show your working.

(5 marks)

Answer _____

11 A sports field is 60 m by 35 m. Nadia uses a small square quadrat with sides of 25 cm to count self-heal plants. Her counts from 10 quadrats are:

1, 0, 3, 2, 0, 1, 4, 2, 1, 2

Estimate the number of self-heal plants on the field. Give your answer to 2 significant figures.

Show your working.

(5 marks)

Answer _____

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12 Ethan estimates how much of a 1200 m^2 grazing field is covered by thistles. He records the percentage cover of thistles in five quadrats.

Quadrat	1	2	3	4	5
Percentage cover	12	18	9	15	21

a. Calculate the mean percentage cover.

b. Estimate the area of the field covered by thistles.

Show your working.

(4 marks)

Answer _____

End of questions | Total 38 marks

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