Sampling with quadrats and transects

Biology required practical | AQA Combined Science 8464 and AQA GCSE Biology 8461 | 14 questions, 35 marks

GCSE science required practicals

This practical online

Name: _____ **Date:** _____ **Score:** _____ **/ 35**

Aim: To estimate the population of a plant species in a habitat using random quadrats, and to see how its distribution changes along a transect.

Equipment: Square quadrat, 0.5 m x 0.5 m (area 0.25 m^2); Two 30 m tape measures; Random number generator (calculator or app); Clipboard, pencil and results table; Identification key or picture guide for the plant; Light meter (for the transect); Gloves.

Results

Chloe and Arjun counted daisies in 10 random quadrats (0.25 m^2 each) on an open lawn and in 10 random quadrats in a shady area under trees on the same school field.

Quadrat	Daisies on open lawn	Daisies under trees
1	6	2
2	9	0
3	4	1
4	7	3
5	8	1
6	5	0
7	10	2
8	7	1
9	6	1
10	8	0

Questions

1 Chloe and Arjun compared the open lawn with the area under trees. Name the independent variable and the dependent variable.

(2 marks)

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2 Explain why the quadrats must be placed at random positions. (2 marks)

3 Describe how to use two tape measures and a random number generator to place a quadrat randomly. (2 marks)

4 Give one hazard when working on a school field and say how to reduce the risk. (2 marks)

5 Calculate the mean number of daisies per quadrat on the open lawn. (2 marks)

6 Find the median number of daisies per quadrat on the open lawn. (1 mark)

7 The open lawn has an area of 600 m^2. Each quadrat has an area of 0.25 m^2.
Estimate the population of daisies on the open lawn. Show your working. (3 marks)

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8 **Higher tier**

The shady area under the trees is a rectangle 8 m by 10 m. The quadrat has sides of 50 cm.

Use the results table to estimate the number of daisies under the trees. Show your working.

(4 marks)

9 Compare the number of daisies on the open lawn and under the trees. Suggest a reason for the difference.

(2 marks)

10 **Higher tier**

Arjun ran a transect from a tree trunk out into the open lawn. He recorded these results:

0 m: light 800 lux, moss cover 70%
2 m: light 2100 lux, moss cover 45%
4 m: light 4600 lux, moss cover 20%
6 m: light 7900 lux, moss cover 5%
8 m: light 8200 lux, moss cover 0%

Arjun concluded that bright light stops moss growing. Evaluate his conclusion.

(3 marks)

11 Chloe says they should have used 30 quadrats in each area instead of 10. Explain why this would improve the estimate.

(2 marks)

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12 Some daisies were partly inside and partly outside the quadrat. Chloe counted them but Arjun did not. Explain the problem and how to solve it.

(2 marks)

13 On the transect Arjun estimated the percentage cover of moss instead of counting moss plants. Explain why.

(2 marks)

14 Plan an investigation to find out how the distribution of dandelions changes with distance from a footpath across a park.

(6 marks)

End of questions | Total 35 marks | The answers sheet has the full method as revision notes.

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