



Fieldwork and sampling: practice questions

3 questions · 11 marks · mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0, **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 11

- 1** A student places quadrats in a field to count daisies. Describe how the student can avoid bias when choosing where to place the quadrats. **[2 marks]**

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- 2** A student counted buttercups in five quadrats, each of area 0.25 m^2 . The counts were 4, 6, 5, 7 and 3. The field has an area of 200 m^2 . Estimate the number of buttercups in the field. **[3 marks]**

Answer =

[illegible]

- 3** Describe how you would investigate the effect of light intensity on the distribution of a plant species from the edge of a wood into the open, using a belt transect and quadrats. **[6 marks]**

[illegible]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [2]

- lay two tape measures at right angles / mark out a grid (1)
- use a random number generator to choose coordinates and place a quadrat at each (1)

2. [3]

- $\text{mean} = (4 + 6 + 5 + 7 + 3) \div 5 = 5$ (1)
- $200 \div 0.25 = 800$ (1)
- $5 \times 800 = 4000$ buttercups (1) allow ecf for an incorrect mean; award 3 marks for a correct answer with no working

3. [6]

Level 3 5-6	A detailed, logical method that includes the transect, regular quadrat placement, counting the species and measuring light intensity at each point, plus at least two ways of improving reliability or control. Scientific terms are used correctly.
Level 2 3-4	A method is given with most of the main steps in a sensible order but some detail is missing, for example the light measurement or the control of variables.
Level 1 1-2	Some relevant steps are stated but the method is incomplete or not in a logical order.

Indicative content

- lay a tape measure in a straight line from the edge of the wood out into the open
- place a quadrat at regular intervals along the tape, for example every 2 m
- count the number of the plant species (or estimate the percentage cover) in each quadrat
- measure light intensity at each quadrat using a light meter
- use the same size quadrat and the same person counting each time
- repeat the transect or take more than one transect and calculate mean values
- plot the number of plants against light intensity to look for a pattern or correlation
- safety: wear suitable footwear, wash hands after, avoid touching unknown plants