Your notes

GCSE Biology: revision notes

Sampling organisms (quadrats and transects)

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Why we sample

- It is usually impossible to count every organism in a habitat, so ecologists count them in small samples and use these to estimate the total.
- Samples must be random, so they fairly represent the whole area.

Required practical: estimating population size with quadrats

- Place **quadrats** (square frames, such as 0.5 m × 0.5 m) randomly in the area, using coordinates from a random number generator.
- Count the number of the species in each **quadrat**.
- Work out the **mean** number per **quadrat**.
- Estimated population = **mean** per **quadrat** × (total area ÷ area of one **quadrat**).

Required practical: transects

- A **transect** is a line, such as a tape measure, across an area where conditions change (for example from a shady wood into an open field).
- Place a **quadrat** at regular intervals along the line and count the organisms or estimate **percentage cover**.
- Measure an abiotic factor at each point, such as light intensity, to see how it affects the **distribution** of the species.

Getting good results

- Use a large number of **quadrats** to make the estimate more accurate.
- Place **quadrats** randomly to avoid bias.

- Decide in advance how to count organisms partly inside the **quadrat**, for example counting only those covering more than half a square.

Key terms

Quadrat	A square frame used to sample organisms in an area.
Transect	A line across a habitat along which samples are taken.
Random sampling	Placing samples so every part of the area has an equal chance of being chosen.
Distribution	Where organisms are found in an area.
Abundance	How many organisms of a species there are in an area.
Percentage cover	The percentage of a quadrat's area covered by a species.
Mean	The total divided by the number of values.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is a quadrat?
2. Why are quadrats placed randomly?
3. What is a transect used to show?
4. A 1 m^2 quadrat has a mean of 4 daisies. The field is 100 m^2. What is the estimated population?
5. A 0.25 m^2 quadrat has a mean of 3 plants. The area is 50 m^2. Estimate the population.
6. How can you make a population estimate more accurate?
7. How do you place quadrats randomly?
8. What could you measure along a transect from a wood into a field?

Answers

1. A square frame used for sampling
2. To avoid bias
3. How the distribution of a species changes across an area
4. 400
5. 600
6. Use more quadrats
7. Use coordinates from a random number generator
8. Light intensity

What to do next

Practise 10 questions on this topic

Try 6 exam questions, with mark schemes

Read the lesson, one step at a time

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