

Edexcel Biology IGCSE

4.4B: Distribution and Biodiversity

Practical notes



Field investigation

Aim

- A. Investigate the distribution of organisms in their habitats (using the continuous sampling method of belt transect).
- B. Measure biodiversity using quadrats (using random sampling).

Equipment

- Frame quadrat (25 cm by 25 cm)
- Tape measures
- Clipboard
- Pen
- Paper

Method for part A

1. Write down a hypothesis of the effect of a change in an abiotic factor (eg. light intensity) on the distribution of the plant species.
2. Lay down a tape measure from the base of a tree to an open area of ground (ecological gradient of shaded to unshaded area).
3. Place the quadrat along the '0' end of the tape measure, with one corner touching the '0' mark.
4. Count the number of plants and record it in a table as seen below.
5. Place the quadrat 5 m up the tape measure and repeat step 3.
6. Repeat step 4 at 5 m intervals until you reach the end of the transect line.
7. Gather data from your class to find the mean number of plants at each point along the transect.
8. Plot a graph of 'number of plants' against the ecological gradient that is observed as the distance along the transect line increases. Compare your results to your hypothesis.

Distance along the transect line in m	Number of plants	Light intensity

Method for part B

1. Use a random number generator to obtain 2 numbers, which are to be used as coordinates to find a location on the 2 tape measures set up in one site.
2. Set down the quadrat at the coordinates.
3. Identify different plant species found in the quadrat. Count and record the number of individuals of each species in the quadrat.
4. Repeat steps 1-3 to take 9 more samples.
5. Estimate the population size of the different species using this formula:

$$\text{total area} / \text{area sampled} \times \text{total number of individuals of each species counted}$$



6. Repeat the procedure in another site and compare the results (number of different species and abundance of each species) to determine the differing degrees of biodiversity.

Sources of error

Without repetitions, the results from only one transect line may be anomalous and not reliable.

Risk assessment

Potential hazards from allergies, cuts and stings.

Wash hands thoroughly after the experiment.

Wearing gloves may be necessary for those with allergies.

