

Option C – Practical 1

Sampling an area using a transect

Safety

- No specific hazards are associated with this practical.
- Normal safety precautions when working out of doors should be observed.

Apparatus and materials

- a 20 m transect line marked at 1 m intervals (a long tape measure can be used)
- 0.25 m² quadrat (the size of the quadrat will depend on the organisms being studied: for a line transect of a meadow or seashore a 0.25 m² quadrat would be appropriate, but a smaller size could be used if time is limited, while a larger size 1 m × 1 m could be used to construct a belt transect)
- clipboard, paper and pen
- additional optional equipment:
 - levelling poles
 - pH probe
 - soil sampling bags
 - data-logger for recording temperature, light levels

Introduction

Sampling using a transect enables you to make a systematic survey of a particular area. Transects can be used to compare two different areas that contain similar organisms but differ in an abiotic factor such as their aspect or slope. Alternatively, a transect can be used to investigate how the species present change over the length of the transect, and this can be related to changes in abiotic factors along its length.

Three different sets of data can be collected, which will depend on the study you are undertaking.

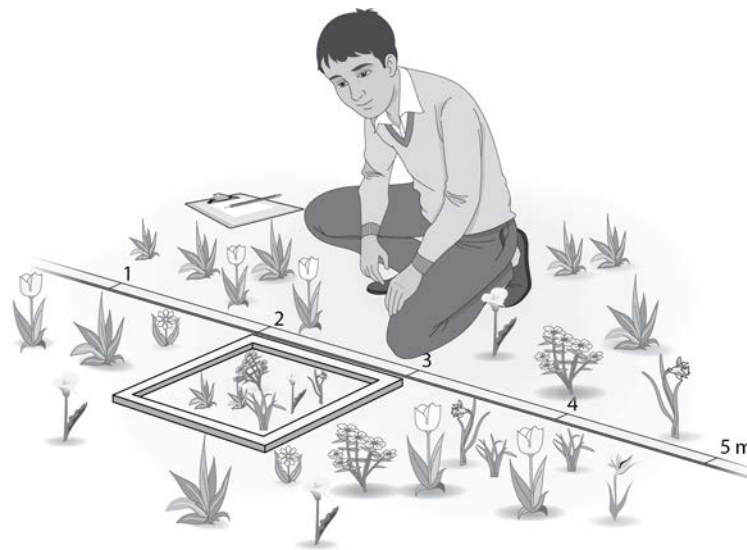
- i Counting the number of each species present in the quadrat can be used to calculate the **species density** (that is, the number of individuals per square metre).
- ii Recording the presence or absence of different species in the quadrat enables you to work out the **species richness** (that is, the number of different species present) or **species frequency** (likelihood of a certain species being found within any quadrat).
- iii For plant species such as grasses, plantain or dandelion, the **percentage cover** can be recorded, that is, a rough estimate of the area within the quadrat taken up by the species.

Any differences in the species present (recorded in any of the ways listed above) can be related to abiotic factors such as slope, soil type or drainage, which may also change over the distance of the sampled area.

Procedure

- 1 Fix one end of the transect line at the starting point for the survey.
- 2 Stretch the line out along the length of the area that is being investigated and fix the other end of the line.
- 3 Place the quadrat at the starting point of the transect line (point 0) and record the organisms found in it. (You will need to determine which of the three possible methods of recording you will use and this will depend on the study you are undertaking.)
- 4 Move the quadrat to the next point along the transect line and record the organisms you find in the same way as in step 3.

- 5 Continue working along the length of the transect line, collecting and recording data at each point.



- 6 Next record abiotic data appropriate to your study. Some examples are suggested here.
- **Slope of the sampled area.** Levelling poles and a protractor can be used to assess the angle of the land along the transect. This may have important consequences for soil drainage in a terrestrial study or exposure on a seashore.
 - **Soil moisture content.** Samples at each point along the transect should be taken and carefully sealed in plastic bags for drying and analysis in the laboratory. These samples can also be used to measure soil pH or mineral content.
 - **Light intensity.** A light meter can be used to measure light levels at each point along the transect. If two areas are being compared it is important to ensure that levels are measured at the same time of day. Seasonal variation may also be important.
- 7 Present your data in an appropriate form to show your results. A kite diagram such as the example below is often used to show species density. The species being studied are shown on the vertical axis and the transect represented by a horizontal line. At each metre along the transect line the number of organisms is shown by dividing the number by 2 and plotting this result both above and below the horizontal line. The points are then joined as shown and the diagram gives a snapshot picture of species distribution along the transect.

