Estimating plant populations with quadrats

Teacher / technician

YEAR 11 / LESSON 104 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Original learning tasks; no supplied numerical example represents class measurements.

Coverage and delivery

Shared Biology / Double Award: 4.2. Population sampling in two areas.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Quadrats	0.5 m × 0.5 m per pair	15
Recording / identification / coordinate sets	1 per pair	15 sets
Measuring tapes and markers	survey boundaries	sufficient for two measured areas
Handwashing / site provision	whole class	school fieldwork arrangements

Immediate safety

Staff check the site for traffic, water, sharp litter, animal waste and unsafe ground. Stay inside agreed boundaries, wear suitable footwear and weather protection, avoid unknown plants and animals, and wash hands before eating. Keep tapes flat and visible to reduce trips.

Preparation and delivery

Read alongside the student method

YEAR 11 / LESSON 104 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Choose two safe accessible areas with an identifiable target plant and measure their areas; a 10 m × 10 m area is a convenient example, not an assumed measurement. Obtain site permission.

2. For each 10 m square use 400 possible 0.5 m grid cells. Randomly select 30 distinct cells across the full area and assign two per area to each of 15 pairs. Adapt the grid to actual measured boundaries.

3. Prepare one target-species card and demonstrate the rooted-individual boundary rule. If individuals cannot be distinguished, choose another species rather than treating shoots as known individuals.

4. Provide 15 quadrats and a shared base-line tape system. Plan recording without trampling unsampled vegetation; record date, weather and obvious habitat differences.

Close of lesson

- Collect tapes and markers, leave organisms in place and check no litter remains.
- Wash hands before eating or drinking.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

YEAR 11 / LESSON 104 / BIOLOGY + SCIENCE (DOUBLE AWARD)

- 0.25 m².
- To reduce placement bias and give the sampling frame coverage.
- Divide mean count by 0.25 m².
- 1200 plants.
- To avoid inconsistent inclusion at edges.
- Area-specific differences and unmeasured factors are not replicated habitat treatments.

References and provenance

Pearson Biology specification

Pearson: core practical guide

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.