Biodiversity and conservation

International Baccalaureate · IB Diploma · Environmental Systems and Societies · SL

Scope and prerequisites

This handout covers selected SL topics for the course first assessed in 2026; it is not the whole syllabus.

Prerequisites: read the stated quantities and units, and use arithmetic and the model conditions below.

The examples are original and fictional: they are not real measurements or real student investigations.

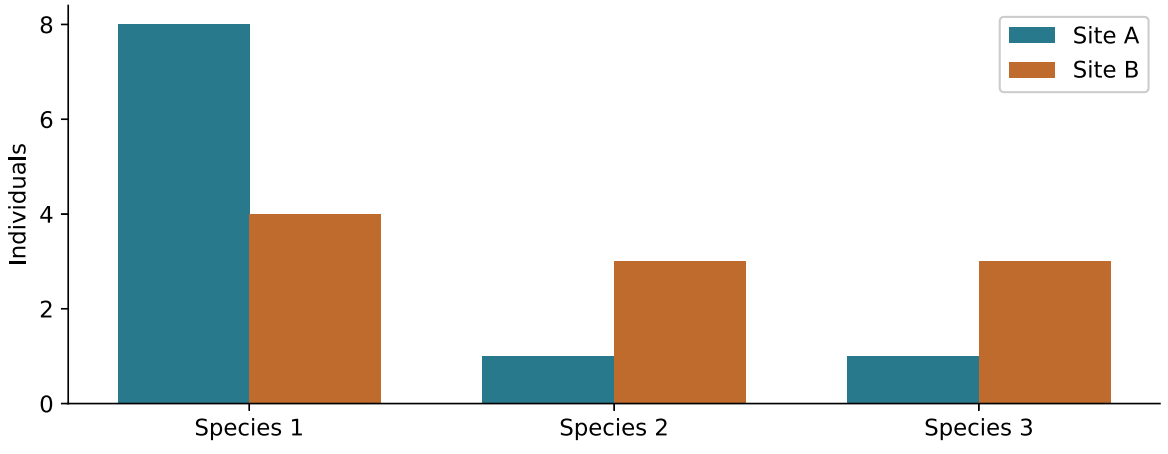
Biodiversity, conservation and sampling evidence

What would explain this observation?

- A site with many individuals can still be dominated by one species. Abundance, richness and **evenness** describe different features of biodiversity.

Build the model

- **Species richness** counts species.
- Evenness concerns relative abundance.
- Conservation can protect habitats, populations or genetic diversity; a management judgement must state the conservation goal.
- species richness: The number of species recorded.
- evenness: How evenly individuals are distributed among species.



Same richness, different evenness: site B is more even

Choose evidence that can test it

- Compare surveys with similar area, effort, season and identification rules.
- A diversity index is meaningful only with its formula and conventions specified.
- Habitat fragmentation can affect movement and gene flow even when total area changes little.

In the lab: Use non-destructive field sampling approved by the school. Identify organisms with a suitable key and record uncertain identifications rather than inventing species. Combine ecological evidence with stakeholder perspectives on land use.

Work from known quantities

- Known: site A has counts 8, 1 and 1; site B has 4, 3 and 3.
- Both have richness 3 and total abundance 10.
- The most abundant species occupies 80% in A and 40% in B.
- B is more even under these counts.

Your turn: A survey records 6, 5, 3 and 2 individuals in four species. Find species richness.

Check the conclusion and its limits

- An index cannot by itself explain the cause of a difference.
- A newly recorded species may reflect improved observation rather than a recent ecological arrival.

Not true: A larger total number of individuals always means greater species richness. Richness counts how many species are present, not how many individuals. Ten thousand individuals of one species give richness 1, while ten species with one individual each give richness 10.

Key:

- Species richness counts species.
- Compare surveys with similar area, effort, season and identification rules.
- Watch for: an index cannot by itself explain the cause of a difference.

Write from a richness of 5

- A survey records 7, 2, 2, 2 and 1 individuals across five species.
- State the species richness. A larger total of individuals is not greater richness.