

Ecological niches · supported focus

International Baccalaureate · IB Diploma · Biology · HL

Scope and prerequisites

Supported HL focus. First assessment 2025; current subject brief acquired; full Biology guide not acquired. Remaining guide, assessment and practical requirements retain their recorded holds.

Prerequisites: read the stated quantities and units, use arithmetic and the model conditions below. Each lesson develops its own method before independent transfer.

These are original or explicitly fictional teaching examples, not actual measurements or completed assessed learner investigations.

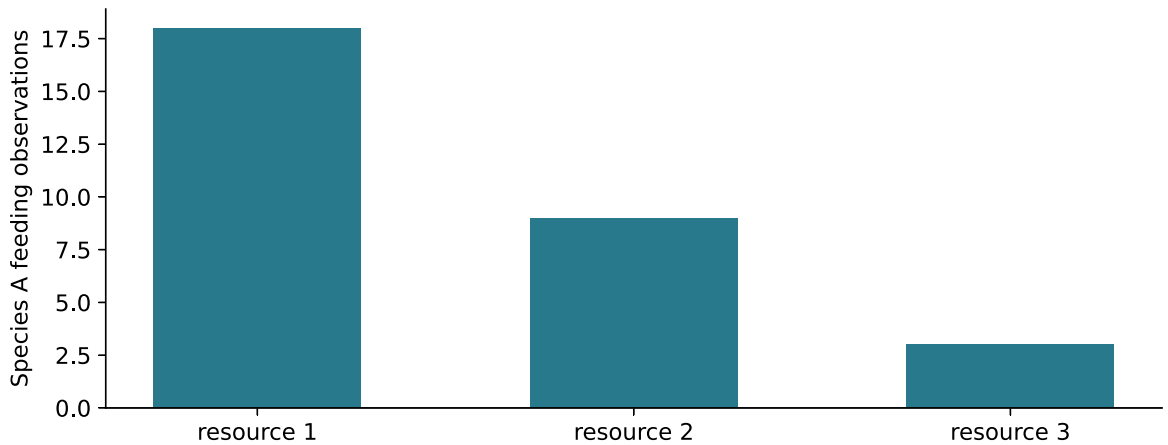
Ecological niches: resources, conditions and interactions

■ What would explain this observation?

- Two species can share a habitat while using different resources or using the same resource at different times. A niche describes more than a location.
- Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

■ Build the model

- An **ecological niche** includes how an organism uses resources, responds to conditions and interacts with other organisms. A fundamental niche describes potential conditions without restrictive biotic interactions in the model; a realized niche describes the conditions occupied when those interactions operate. Competition can restrict resource use or distribution.
- ecological niche: The resource use, conditions and interactions associated with an organism's role; **resource partitioning** : Differences in resource use that can reduce overlap among organisms.



■ Choose evidence that can test it

- Separate a habitat observation from a causal claim about a niche boundary. Absence from a site can reflect dispersal, detection, abiotic conditions or interactions. Resource partitioning can reduce overlap, but an observational difference alone does not prove that competition caused it. Compare alternative explanations and the timescale of evidence.
- Use permitted field observations or an attributed dataset. Record species identification confidence, resource category, time, abiotic conditions and sampling effort. Repeat observations at several locations rather than choosing only patches that fit the hypothesis. Non-destructive comparisons or approved models should be used instead of removing native species or introducing competitors.

■ Work from known quantities

- State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution.
- Known: fictional birds A use resource categories in counts 18, 9 and 3 out of 30 observations; birds B use 3, 9 and 18. Their shared middle category is 30% for each, but the preferred categories differ. This is evidence of different observed resource use. It does not alone establish their full niches or demonstrate the cause of the difference.

Example:

A species uses one resource in 12 of 40 feeding observations. Calculate the observed percentage. Use the same sequence: known quantities → model → relation → substitution → unit and interpretation.

■ Check the conclusion and its limits

- A niche is not identical to a trophic level or a habitat. A realized niche is a context-dependent model, and an incomplete survey cannot establish every tolerance limit or competitive interaction.
- Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Warn:

Two species living in the same habitat necessarily have identical ecological niches. This claim is false: A niche is not identical to a trophic level or a habitat. A realized niche is a context-dependent model, and an incomplete survey cannot establish every tolerance limit or competitive interaction.

Key:

Ecological niches: resources, conditions and interactions: Separate a habitat observation from a causal claim about a niche boundary. Absence from a site can reflect dispersal, detection, abiotic conditions or interactions. Resource partitioning can reduce overlap, but an observational difference alone does not prove that competition caused it. Compare alternative explanations and the timescale of evidence.