Review: ecology and human impacts

Student activity • observation and reasoning

YEAR 11 / LESSON 113 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Can you connect sampling evidence with ecological mechanisms?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, pencil and ruler
- Earlier field records and ecological process diagrams

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared ecology and human impacts; Biology-only biodiversity, nitrogen-cycle and fish-farming extensions marked.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Define ecological terms and distinguish abundance from distribution.

2. Explain how random quadrats estimate a population and why a transect answers a different spatial question.

3. Trace energy through a food web and carbon through a cycle without confusing the two.

4. Explain eutrophication and greenhouse warming using separate causal sequences.

5. Biology extension: compare nitrogen-fixing, nitrifying and denitrifying roles and explain biodiversity beyond species count alone.

6. Evaluate one intervention using benefits, disadvantages and evidence limitations.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Use actual field records where available, with equal sampling effort and correct area units. Biology extensions include detailed biodiversity, nitrogen cycling, fish farming and deforestation effects.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Why randomise quadrat placement?

2. What does a transect show?

3. Is energy cycled like carbon?

4. Why can nutrient enrichment lower oxygen?

5. Biology: what does denitrification return?

6. Why is an intervention not automatically beneficial in every context?