Carbon cycling and forest change

Student activity • observation and reasoning

YEAR 11 / LESSON 109 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How does carbon move between organisms and the environment?

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

Equipment

- Student booklet, pencil and ruler
- Carbon-store and process-arrow cards

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

Course coverage: Shared Biology / Double Award: 4.10. Biology-only extension: 4.18B deforestation.

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. Draw carbon stores in atmosphere, plants, animals, dead organic matter and fuels.

2. Label transfers by photosynthesis, feeding, respiration, decomposition and combustion.

3. Explain that plants respire as well as photosynthesise, and decomposer respiration returns carbon dioxide.

4. Distinguish the cycling of carbon atoms from energy transfer through ecosystems.

5. Biology extension: evaluate how forest removal can reduce carbon uptake and release stored carbon through burning or decay.

6. Biology extension: connect vegetation loss with erosion, mineral leaching and altered evapotranspiration, noting that impacts depend on conditions and land use.

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

Carbon moves through chemical forms and stores. Photosynthesis takes up CO_2; respiration and combustion return it. Decomposition involves organisms whose respiration releases carbon. Detailed deforestation effects on soil and water cycling are Biology extensions.

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. Which process takes atmospheric CO_2 into biomass?

2. Do plants respire?

3. How does feeding move carbon?

4. How can burning affect atmospheric CO_2?

5. Biology: why can forest removal affect carbon storage?

6. Biology: name one soil or water-cycle effect.