Nitrogen cycling and bacterial roles

Teacher / technician

YEAR 11 / LESSON 110 / BIOLOGY ONLY

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

Coverage and delivery

Biology only: 4.11B. Nitrogen cycle.

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
Student booklets	1 per learner	30
Nitrogen-pool and microbial-process cards	1 set per pair	15 sets
Rulers	1 per pair	15

Immediate safety

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

Preparation and delivery

Read alongside the student method

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1. Provide 30 booklets, 15 rulers and 15 sets of nitrogen-pool and microbial-process cards.

2. Keep answers separate until learners have attempted the tasks; discuss the reasons for corrections.

3. Use separate ammonium, nitrite, nitrate and atmospheric nitrogen cards, with arrows for fixation, assimilation, feeding, decomposition, nitrification and denitrification. No soil handling or microbial culture is included.

Close of lesson

• Return models and keep the corrected work.

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

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- Conversion of N_2 into biologically usable nitrogen compounds.
- Mineral nitrogen such as nitrate and ammonium.
- Ammonium compounds.
- Nitrite and then nitrate.
- Nitrogen gas to the atmosphere.
- No; they rely on available fixed nitrogen compounds.

References and provenance

Pearson Biology specification

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.