

Higher Combined version — Higher Tier (★) included; Separate-only (◆) removed.

★ HIGHER TIER

Q1. ★ Describe the nitrogen cycle, naming the four types of bacteria involved and the role of each.

[4 marks]

★ HIGHER TIER

Q2. ★ Explain the advantage of growing legumes (such as clover or beans) in crop rotation.

[3 marks]

Total: 7 marks

Q1 (4 marks) [★ HT]

★ Describe the nitrogen cycle, naming the four types of bacteria involved and the role of ...

- Nitrogen-fixing bacteria (in soil/root nodules): convert atmospheric N_2 → ammonia/nitrates [1]
- Nitrifying bacteria: convert ammonia → nitrites → nitrates (available for plants) [1]
- Decomposers: break down dead organisms → release ammonia [1]
- Denitrifying bacteria: convert nitrates → N_2 gas → return nitrogen to atmosphere [1]

Q2 (3 marks) [★ HT]

★ Explain the advantage of growing legumes (such as clover or beans) in crop rotation.

- Legumes have root nodules containing nitrogen-fixing bacteria (Rhizobium) [1]
- These convert atmospheric N_2 into nitrates in the soil [1]
- Nitrates act as a natural fertiliser for subsequent crops — reduces need for artificial fertilisers [1]