IGCSE BIOLOGY • EXERCISE SHEET

19.3 Nutrient cycles

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

KEY WORDS nitrogen cycle 氮循环 • nitrate ions 硝酸根离子 • carbon dioxide 二氧化碳 • nitrogen fixation 固氮作 • fossil fuels 化石燃料

Objective

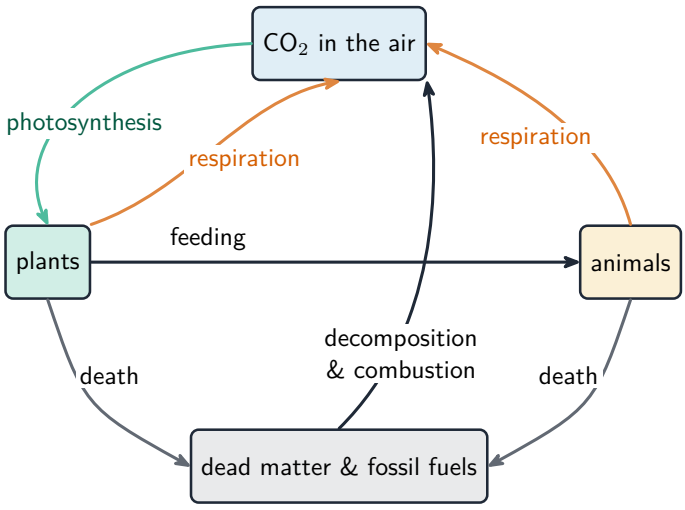
Build the skills to answer exam questions on **nutrient cycles** 营养循环 — the **carbon cycle** 碳循环 and the **nitrogen cycle** 氮循环.

You must be able to:

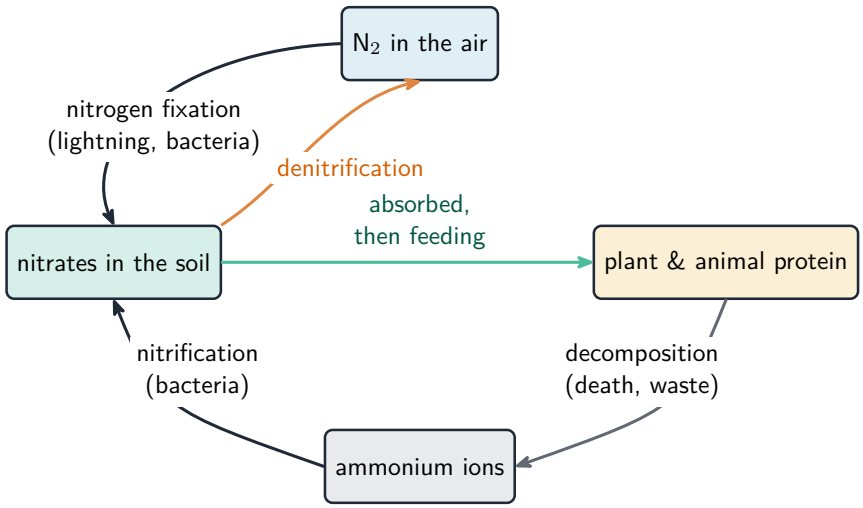
- describe the carbon cycle (photosynthesis, respiration, combustion, decay)
- describe the nitrogen cycle and the roles of microorganisms
- contrast nutrient recycling with one-way energy flow

1 Worked examples

■ Carbon and nitrogen cycles



Photosynthesis removes CO_2; respiration, combustion and decay return it



Microorganisms: decomposition, nitrification, nitrogen fixation, denitrification

2 Practice

2.1 Name the process that removes carbon dioxide from the air, and name one process that returns it. [2]

2.2 Name two processes that return carbon dioxide to the air. [2]

3 Exam-style questions

3.1 In the nitrogen cycle, bacteria that turn ammonium ions into nitrate ions carry out: [1]

- **A** nitrogen fixation
- **B** nitrification
- **C** denitrification
- **D** decomposition

3.2 The carbon cycle keeps carbon moving.

(a) Describe how carbon passes from a plant to a consumer. [1]

(b) Explain how burning fossil fuels affects the carbon cycle. [2]

Solutions

2.1 photosynthesis; respiration, combustion of fossil fuels or decomposition.

2.2 respiration; combustion (burning).

3.1 B. Turning ammonium into nitrate is nitrification.

3.2 (a) the consumer eats the plant (feeding).
(b) it releases carbon dioxide into the air, adding to the amount in the atmosphere.