

1 Biogeochemical cycles – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English

Write it 3 times (English)

carbon cycle

water cycle

nitrogen cycle

Recall

In Part A you followed energy through an ecosystem. Now follow the **matter**:

- Water evaporates, forms clouds, and falls as rain – the water cycle.
- Carbon moves between the air, living things, and the ground.
- Unlike energy, matter is **recycled** again and again.

Each idea has a short worked example before the Practice.

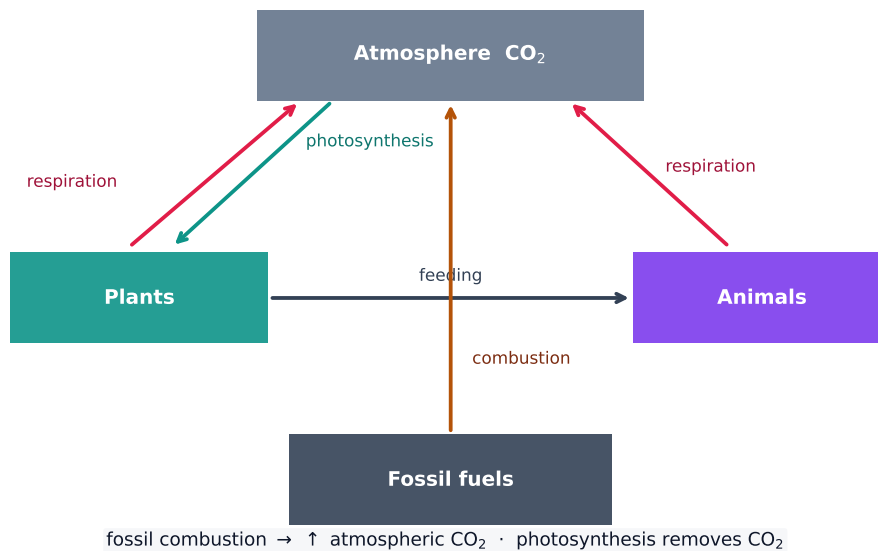
New ideas

■ 1 Matter cycles, energy flows

Energy flows one way and is lost as heat, but **matter** (carbon, nitrogen, water) is used over and over – it **cycles** between living things and the environment.

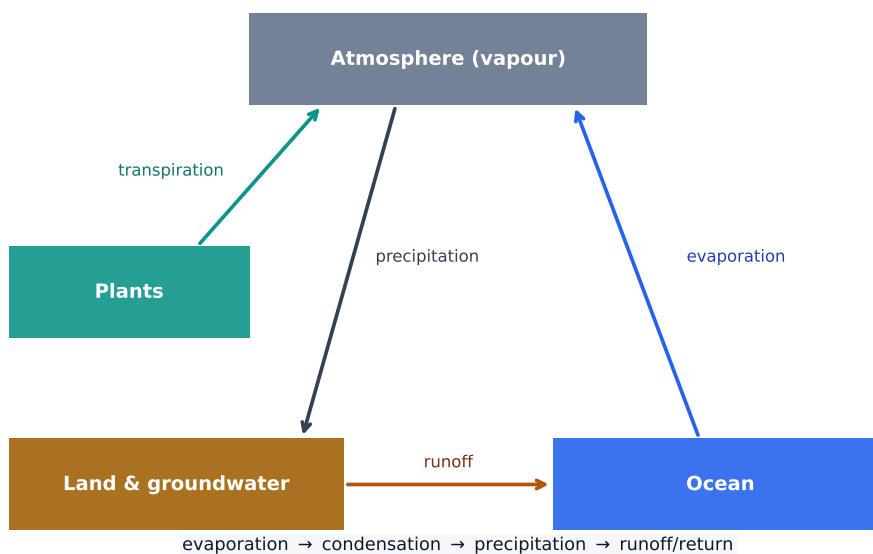
■ 2 The carbon cycle

In the **carbon cycle**, carbon moves as CO₂: taken from the air by photosynthesis, returned by respiration and by burning fuels.



■ 3 The water cycle

In the **water cycle**, water evaporates from oceans, condenses into clouds, falls as rain, and runs back to the sea.



■ 4 The nitrogen cycle

In the **nitrogen cycle**, nitrogen from the air is turned into forms plants can use (by bacteria), passed along food chains, and returned to the air.

Watch out: energy and matter behave differently – energy **flows through** an ecosystem and is lost, but matter **cycles** and is reused. Burning fossil fuels adds extra carbon to the air, upsetting the natural carbon cycle.

Practice

Try these in order. The methods are all above.

2.1 State the key difference between how energy and matter move through an ecosystem. [2]

2.2 State two processes that add carbon dioxide to the air, and one that removes it. [3]

2.3 List, in order, the main steps of the water cycle. [2]

2.4 State why plants cannot use nitrogen gas from the air directly. [1]

2.5 Explain how burning fossil fuels upsets the carbon cycle. [2]
