

1.4 The Carbon Cycle

Name: _____ Class: _____ Date: _____

Total: 10 marks

Objective

Build the skills to answer exam questions on the **carbon cycle**.

You must be able to:

- name the processes that move carbon (**photosynthesis, respiration, decomposition, combustion**)
- identify carbon **reservoirs** 碳库
- explain how humans disturb the cycle

1 Worked examples

Study these first. Each one shows the method for a question type used later —follow the steps and you can do the Practice and Exam-style questions yourself.

■ Moving carbon

The **carbon cycle** moves carbon between the atmosphere, organisms, oceans, and rocks:

- **Photosynthesis** removes CO₂ from the air.
- **Respiration** and **decomposition** return CO₂.
- **Combustion** (burning fossil fuels) releases stored carbon.

■ Reservoirs

Carbon is stored in **reservoirs**: the atmosphere (CO₂), organisms, the ocean (dissolved), soil, and rocks/fossil fuels (the largest, slowest store).

■ Human disturbance

Burning **fossil fuels** adds CO₂ far faster than natural processes remove it, raising atmospheric CO₂ and driving climate change. Deforestation also reduces CO₂ uptake.

■ A worked link

A tree takes in CO₂ (photosynthesis); when it burns or decays, that carbon returns to the atmosphere.

2 Practice

Now apply the methods above.

2.1 Which process removes CO₂ from the atmosphere? [1]

2.2 Name two processes that return CO₂ to the atmosphere. [2]

2.3 Name the largest, slowest carbon reservoir. [1]

3 Exam-style questions

3.1 The process that removes carbon dioxide from the air is [1]

- **A** respiration
 - **B** combustion
 - **C** photosynthesis
 - **D** decomposition
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3.2 Humans burn large amounts of fossil fuels.

(a) Explain how this disturbs the carbon cycle. [2]

(b) State one other human activity that affects the cycle. [1]

3.3 Explain why atmospheric CO₂ is rising even though photosynthesis removes CO₂. [2]

4 Go further

You are now ready for the real exam questions on this subtopic:

- work through the **1.4 The Carbon Cycle** lesson on the **Learn** page;
- read the **The Carbon Cycle** section of the AP Environmental Science handout on the **Know** page.

Solutions

2.1 Photosynthesis.

2.2 Any two: respiration, decomposition, combustion.

2.3 Rocks / fossil fuels (sediments).

3.1 C —photosynthesis.

3.2 (a) Burning fossil fuels releases stored carbon as CO_2 far faster than natural processes remove it, raising atmospheric CO_2 . (b) Deforestation (reduces CO_2 uptake).

3.3 Humans release CO_2 (burning fossil fuels, deforestation) faster than photosynthesis and the oceans can absorb it, so the net amount in the atmosphere increases.