

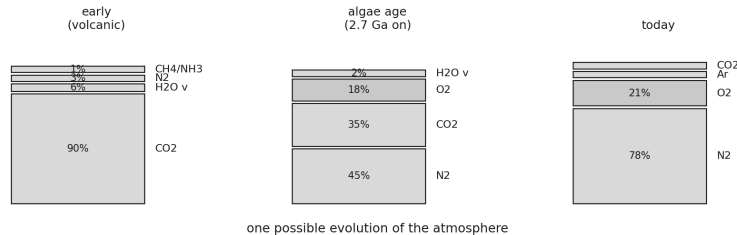
Exercise walk-through

9.1

Evolution of the Earth's atmosphere (4.9.1.1–4.9.1.2)

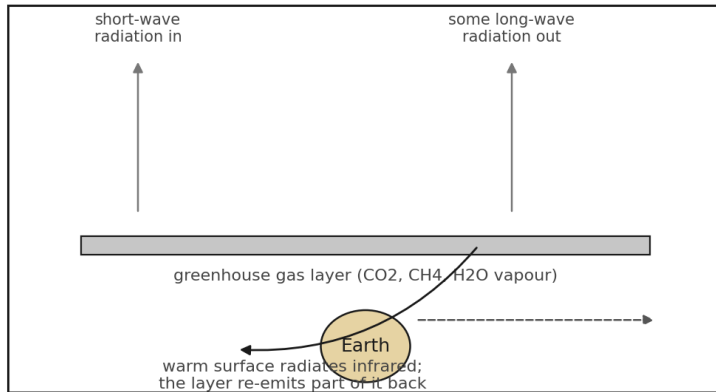
AQA · GCSE · Chemistry

The evolving atmosphere



- Early — CO₂, water vapour, nitrogen, methane; no oxygen.
- Oceans condensed; CO₂ dissolved into carbonate sediments.
- Photosynthesis — oxygen up, carbon buried as fossil fuels.

The greenhouse effect



- CO₂, methane, water vapour — the greenhouse gases.
- In — short-wave; out — long-wave infrared, partly trapped.
- Human causes — fossil fuels, deforestation, cattle, landfill.

Exercises 2.1·2.3

2.1 Name the process that raised atmospheric oxygen. [1]

2.2 What happened to most of the early water vapour? [1]

2.3 Give today's two main atmospheric gases with approximate proportions. [2]

3 Exam-style questions

Exercises 2.1·2.3

2.1 Name the process that raised atmospheric oxygen. [1]

2.1 Photosynthesis.

2.2 What happened to most of the early water vapour? [1]

2.2 It condensed to form the oceans.

2.3 Give today's two main atmospheric gases with approximate proportions. [2]

3 Exam-style questions

2.3 Nitrogen ~78–80 %; oxygen ~20–21 %.

Exercises 3.1·3.3

3.1 Give two reasons why scientists cannot be certain about the early atmosphere. [2]

3.2 Describe two processes that reduced the carbon dioxide level of the early atmosphere. [4]

3.3 Explain the role of the oceans in the change from the early atmosphere to today's. [3]

Exercises 3.1·3.3

3.1 Give two reasons why scientists cannot be certain about the early atmosphere. [2]

3.1 No measurements from the time exist; the atmosphere can only be inferred indirectly – from gases in ancient ice cores and comparison with other planets.

3.2 Describe two processes that reduced the carbon dioxide level of the early atmosphere. [4]

3.2 Dissolving in the oceans – CO₂ is soluble and formed carbonate sediments via shells/skeletal remains; photosynthesis by algae and plants absorbed CO₂, locking the carbon into living matter and eventually fossil fuels.

3.3 Explain the role of the oceans in the change from the early atmosphere to today's. [3]

3.3 The oceans formed when water vapour condensed as the planet cooled; they dissolved large amounts of CO₂, removing it from the air; marine organisms used the dissolved carbon to make carbonate shells, which became sediments – permanently storing carbon.