



Evolution of the Earth's Atmosphere

Read the comprehension sheet and then answer the questions below.

1. What fraction of the Earth's atmosphere today is made up of:

nitrogen? _____

oxygen? _____

2. Which other gases are found in today's atmosphere?

3. Why can scientists not be certain about the composition of the early atmosphere?

Tick **two** boxes.

☐

It was formed 4.6 billion years ago.

☐

There are several different theories about its composition.

☐

There is very little evidence about its composition.

☐

They cannot land on other planets.

4. What caused a build-up of carbon dioxide and nitrogen in the early atmosphere?

5. Why is it useful for scientists to study the atmospheres of other planets?



6. Complete the sentences to describe what happened to the water vapour in the Earth's early atmosphere.

As the temperature of the Earth _____ the water vapour in the atmosphere _____ and fell as rain. This settled on the surface to form _____.

7. Why did the evolution of algae and plants affect the proportion of gases in the atmosphere?

Tick **one** box.

- ☐ Plants take in carbon dioxide and release oxygen in photosynthesis.
 - ☐ Plants take in carbon dioxide and release oxygen in respiration.
 - ☐ Plants take in oxygen and release carbon dioxide in photosynthesis.
 - ☐ Plants take in oxygen and release carbon dioxide in respiration.

8. Explain how the formation of oceans affected the amount of carbon dioxide in the atmosphere.

The amount of carbon dioxide increased/decreased (circle one)

because _____

9. Explain how carbon has become locked up in fossil fuels.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.



Evolution of the Earth's Atmosphere **Answers**

Read the comprehension sheet and then answer the questions below.

1. What fraction of the Earth's atmosphere today is made up of:

nitrogen? $\frac{4}{5}$

oxygen? $\frac{1}{5}$

2. Which other gases are found in today's atmosphere?

carbon dioxide

water vapour

noble gases

3. Why can scientists not be certain about the composition of the early atmosphere?

Tick **two** boxes.

☒

It was formed 4.6 billion years ago.

☐

There are several different theories about its composition.

☒

There is very little evidence about its composition.

☐

They cannot land on other planets.

4. What caused a build-up of carbon dioxide and nitrogen in the early atmosphere?

Intense volcanic activity released the gases into the atmosphere.

5. Why is it useful for scientists to study the atmospheres of other planets?

The atmospheres on Mars and Venus today are thought to be very similar to the early atmosphere on Earth, with lots of carbon dioxide and little or no oxygen.

6. Complete the sentences to describe what happened to the water vapour in the Earth's early atmosphere.

As the temperature of the Earth **decreased** the water vapour in the atmosphere **condensed** and fell as rain. This settled on the surface to form **oceans**.

7. Why did the evolution of algae and plants affect the proportion of gases in the atmosphere?

Tick **one** box.

- ☒ Plants take in carbon dioxide and release oxygen in photosynthesis.
- ☐ Plants take in carbon dioxide and release oxygen in respiration.
- ☐ Plants take in oxygen and release carbon dioxide in photosynthesis.
- ☐ Plants take in oxygen and release carbon dioxide in respiration.

8. Explain how the formation of oceans affected the amount of carbon dioxide in the atmosphere.

The amount of carbon dioxide increased/**decreased** (circle one)

because **carbon dioxide in the atmosphere dissolved in the oceans. They formed soluble carbonate compounds which precipitated and eventually formed sedimentary rocks.**

9. Explain how carbon has become locked up in fossil fuels.

When plants die in swamps, they become buried in sediments. The absence of oxygen means that oxidation does not occur. The heat from the Earth's crust and pressure from layers of sediment over millions of years causes plant remains to form coal.

When plants and simple animals die in oceans, they sink to the bottom and become buried in sediments. The absence of oxygen means that oxidation does not occur. The heat from the Earth's crust and pressure from layers of sediment over millions of years causes plant and simple animal remains to form crude oil and natural gas.