

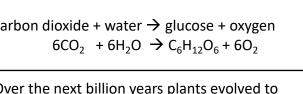
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Gas	Percentage
Nitrogen	~80%
Oxygen	~20%
Argon	0.93%
Carbon dioxide	0.04%

Proportions of atmosphere gases in the

Algae and plants	These produced the oxygen that is now in the atmosphere, through photosynthesis.
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carbon dioxide + water → glucose + oxygen $6CO_{2} + 6H_{2}O \rightarrow C_{6}H_{12}O_{6} + 6O_{2}$

Over the next billion years plants evolved to gradually produce more oxygen. This gradually increased to a level that enabled animals to evolve.



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Volcano activity 1 st Billion years	Billions of years ago there was intense volcanic activity	This released gases (mainly CO ₂) that formed to early atmosphere and water vapour that condensed to form the oceans.
Other gases	Released from volcanic eruptions	Nitrogen was also released, gradually building up in the atmosphere. Small proportions of ammonia and methane also produced.
Reducing carbon dioxide in the atmosphere	When the oceans formed, carbon dioxide dissolved into it	This formed carbonate precipitates, forming sediments. This reduced the levels of carbon dioxide in the atmosphere.

How oxygen increased The **How carbon** Earth's early atmosphere dioxide decreased

Composition and evolution of the atmosphere

Oxygen in the

atmosphere

Formation of sedimentary rocks

and fossil fuels

Reducing carbon

dioxide in the

atmosphere

First produced by algae 2.7 billion

years ago.

Algae and plants

These are made out of the remains of biological matter, formed over millions of years

photosynthesis. Remains of biological matter falls to the bottom of oceans. Over millions of years layers of sediment settled on top of them and the huge pressures turned them into coal, oil, natural gas and sedimentary rocks.

The sedimentary rocks contain carbon

dioxide from the biological matter.

These gradually reduced the carbon dioxide

levels in the atmosphere by absorbing it for

AQA GCSE Chemistry of the atmosphere

Common

atmospheric

pollutants

Toxic, colourless and odourless

gas. Not easily detected, can kill.

Cause respiratory problems in

humans and acid rain which

affects the environment.

Cause global dimming and health

problems in humans.

CO₂ and methane as greenhouse gases

Carbon footprints

The total amount of greenhouse gases emitted over the full life cycle of a product/event. This can be reduced by reducing emissions of carbon dioxide and methane.

Greenhouse gases

Carbon dioxide, water vapour and methane

Examples of greenhouse gases that maintain temperatures on Earth in order to support life

The greenhouse effect

Global climate

change

Radiation from the Sun enters the Earth's atmosphere and reflects off of the Earth. Some of this radiation is re-radiated back by the atmosphere to the Earth, warming up the global temperature.

Atmospheric pollutants from fuels

Combustion of fuels	Source of atmospheric pollutants. Most fuels may also contain some sulfur.
Gases from burning fuels	Carbon dioxide, water vapour, carbon monoxide, sulfur dioxide and oxides of nitrogen.
Particulates	Solid particles and unburned hydrocarbons released when burning fuels.

Properties and effects of atmospheric pollutants

Carbon

monoxide

Sulfur

dioxide and

oxides of

nitrogen

Particulates

Effects of climate change

Rising sea levels

Extreme weather events such as severe storms

> Change in amount and distribution of rainfall

Changes to distribution of wildlife species with some becoming extinct

Human activities and greenhouse gases

Human activities that increase carbon Carbon dioxide levels include burning fossil fuels dioxide and deforestation. Human activities that increase methane levels include raising livestock (for food) Methane and using landfills (the decay of organic matter released methane). There is evidence to suggest that human

Climate activities will cause the Earth's atmospheric temperature to increase and change cause climate change.