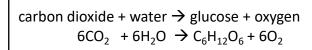


Gas	Percentage
Nitrogen	~80%
Oxygen	~20%
Argon	0.93%
Carbon dioxide	0.04%

Proportions of gases in the atmosphere

The

Earth's early atmosphere





Oxygen in the	First produced by algae 2.7 billion
atmosphere	years ago.

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

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.

Atmospheric pollutants from fuels

How carbon dioxide decreased

How oxygen increased

Composition and evolution of the atmosphere

AQA GCSE Chemistry of the atmosphere

Common atmospheric pollutants

Reducing carbon dioxide in the atmosphere

Formation of sedimentary rocks and fossil fuels Algae and plants

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

levels in the atmosphere by absorbing it for photosynthesis.

Remains of biological matter falls to the bottom of oceans. Over millions of years

These gradually reduced the carbon dioxide

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.

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

change

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.

Human activities and greenhouse gases

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.

Carbon monoxide

Toxic, colourless and odourless gas. Not easily detected, can kill.

Sulfur dioxide and oxides of nitrogen

Cause respiratory problems in humans and acid rain which affects the environment.

Properties and effects of

atmospheric pollutants

Particulates Cause global dimming and health problems in humans.

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

Carbon dioxide

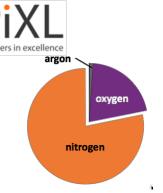
Human activities that increase carbon dioxide levels include burning fossil fuels and deforestation.

Human activities that increase methane levels include raising livestock (for food) and using landfills (the decay of organic matter released methane).

There is evidence to suggest that human activities will cause the Earth's

atmospheric temperature to increase and

cause climate change.



Gas	Percentage
	~80%
	~20%
	0.93%
	0.04%

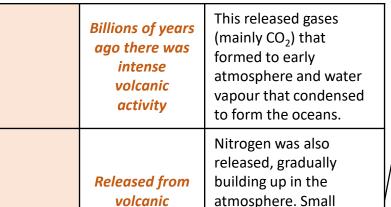
Proportions of gases in the atmosphere

These produced the oxygen that is now in the atmosphere, through
photosynthesis.

carbon dioxide + water \rightarrow glucose + oxygen $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$



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



Nitrogen was also released, gradually building up in the atmosphere. Small proportions of ammonia and methane also produced.

This formed carbonate precipitates, forming sediments. This reduced the levels of carbon

dioxide in the

atmosphere.

The Earth's early atmosphere

How oxygen increased

How carbon dioxide decreased

Composition and evolution of the atmosphere

AQA GCSE
Chemistry of the atmosphere

Common atmospheric pollutants

Algae and plants

These gradually reduced the carbon dioxide levels in the atmosphere by absorbing it for photosynthesis.

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

Global climate

change

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.

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

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

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.

Source of atmospheric pollutants. Most fuels may also contain some sulfur.

eruptions

When the

oceans formed,

carbon dioxide

dissolved into it

Atmospheric pollutants from fuels

Carbon dioxide, water vapour, carbon monoxide, sulfur dioxide and oxides of nitrogen.

Solid particles and unburned hydrocarbons released when burning fuels.

atmospheric pollutants

Properties and effects of

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 that increase carbon dioxide levels include burning fossil fuels and deforestation.

Human activities and greenhouse gases

Human activities that increase methane levels include raising livestock (for food) and using landfills (the decay of organic matter released methane).

There is evidence to suggest that human activities will cause the Earth's atmospheric temperature to increase and cause climate change.

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.

ΊXL		Gas	Percentage	_					carban diavida	Luctor - Salvence Lovern	PIXL	
tners in excellence argon	Nitrogen		Propogase	Algae and plants					+ water \rightarrow glucose + oxygen + $6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$			
nitroge	oxygen	Argon Carbon dioxide		Proportions of gases in the atmosphere	Oxygen in the atmosphere				gradually produ	pillion years plants evolved to uce more oxygen. This gradually level that enabled animals to		
Volcano activity 1 st Billion years	,	(mainly formed atmosp vapour	eased gases CO ₂) that to early here and water that condensed the oceans.	The Earth's	How oxygen incredit How carb dioxide decrees omposition a	on eased	Reducing carl dioxide in the atmospher	e e		These gradually reduced the carbo levels in the atmosphere by absorb photosynthesis. Remains of biological matter falls to bottom of oceans. Over millions of layers of sediment settled on top o	o the years	
Other gases		released building atmosp proport	n was also d, gradually g up in the here. Small ions of ammonia thane also	atmospher	atmosphere AQA GCSE hemistry of t	9	sedimentary re and fossil fue	ocks	Greenhou	and the huge pressures turned the coal, oil, natural gas and sedimenta. The sedimentary rocks contain card dioxide from the biological matter.	m into ary rocks. oon	
Reducing carbon dioxide in the atmosphere		This for precipit sedimer	med carbonate ates, forming nts. This reduced els of carbon in the	atmo	atmosphere nmon spheric utants		CO ₂ and me as greenh gases on footprints	ouse	Carbon dioxi water vapo and methar	ur		
Atmospheric pollutants from fuels Prope		rties and effe	ects of grants	ases emitto cycle of a p can be red	nount of greenhouse ted over the full life product/event. This duced by reducing f carbon dioxide and	al clima hange	The greenhouse effect					
Combustion of fuels						m	methane.		Human activities and greenhouse gases			
Casas from			Carbon monoxide	\			Effects of climate	change	Carbon dioxide			
Gases from burning fuels			Sulfur dioxide and oxides of nitrogen						Methane			
Particulates			Particulates						Climate change			

PIXL		Gas	Percentage													PiXL _{sci}
rtners in excellence argon		Nitrogen		au	gas	Prop	Algae and p	olants								
	NAME OF THE PARKET	Oxygen		Jose	es i	ort:										
	oxygen	Argon		a unospiiere	gases in the	Proportions of	Oxygen in	the								
nitroge	n	Carbon		ר	, 10	of	atmospho	ere								
		dioxide				_	l	_								
				│ [.	-]\	\ \ \	low oxygen		ed		Reducing carbon					
Volcano activity					The F			carbon decreas	ed		dioxide in the atmosphere					
1 st Billion					Farth's	<u> </u>	dioxide decreased			atmosphere						
years					, D)	C	ompositi	on and	d	1						
				early			volution of the				Formation of					
					#		atmospl	here			sedimentary rocks and fossil fuels					
Other gases					atmosphere		AQA GCSE									
					Pre	C				L			Greenhou	SE GASES		
Reducing	Reducing			Chemistry of the atmosphere					CO ₂ and methane as greenhouse			Carbon dioxide,				
carbon					atmosphere			\								
dioxide in the						Con	nmon				gases		water vapo and metha			
atmosphere					at	mo	spheric		Carbo	on fo	ootprints					
		•			F	oollu	utants					Glo				
Atmosph	neric pollu	ıtants from fu	iels			/					of greenhouse ver the full life	obal cha	The greenho effect	use		
			=				ects of	cycle	of a p	rodu	ct/event. This	bal clima change	Circut			
Combustion			atmo	sph	eric	pollu	tants				d by reducing oon dioxide and	nate				
of fuels									methane.			Human	activities and	greenhouse gase	es	
			Carbon							Eff	ects of climate cha	inge	Carbon			
			monoxide									<u> </u>	dioxide			
Gases from burning fuels			Sulfur						 							
burning rucis			dioxide and oxides of										Methane			
			nitrogen													
									1				Climate			
Particulates			Particulates										change			