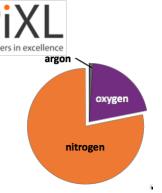


100% sheet

Year 11 Chemistry of the atmosphere



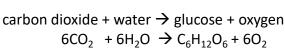
Gas	Percentage
Nitrogen	~80%
Oxygen	~20%
Argon	0.93%
Carbon dioxide	0.04%

The

Earth's early atmosphere

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

 $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$





		┧ ┃	po Se			photosynthesis.			2	0 12 0	2	
Oxygen	~20%	Ӈ-	orti es ii					0	h:11:			1
Argon	0.93%		ons c the	Oxygen in the	First pro	duced by algae 2.7 bil	llion	Over the next gradually prod	uce more	oxygen. This a	gradually	
Carbon dioxide	0.04%		of	atmosphere	years ago.			increased to a level that enabled animals to evolve.				
			\	Have average in are	a a a d		I					1
This re	leased gases		$\Box \setminus \Box$	How oxygen incre	aseu	Reducing carbon			These gi	adually reduc	ced the carbo	n dioxide

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 carbo precipitates, formi sediments. This re the levels of carbo dioxide in the atmosphere.								
Atmospheric pollutants from fuels									

now oxygen increased How carbon dioxide decreased **Composition and**

Algae and pla

evolution of the atmosphere

atmosphere

Common

atmospheric

pollutants

and fossil fuels **AQA GCSE Chemistry of the**

CO₂ and methane as greenhouse gases

Effects of climate change

Rising sea levels

severe storms

Change in amount and distribution of rainfall

Changes to distribution of

wildlife species with some

becoming extinct

dioxide in the

atmosphere

Formation of

sedimentary rocks

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.

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

levels in the atmosphere by absorbing it for

coal, oil, natural gas and sedimentary rocks. The sedimentary rocks contain carbon dioxide from the biological matter.

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

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.

Toxic, colourless and odourless Carbon monoxide gas. Not easily detected, can kill. Sulfur Cause respiratory problems in dioxide and humans and acid rain which oxides of affects the environment. nitrogen Cause global dimming and health **Particulates** problems in humans.

Properties and effects of

atmospheric pollutants

Carbon dioxide Extreme weather events such as Methane Climate change

Global climate

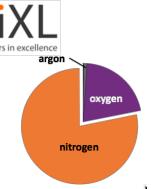
change

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.

Human activities that increase carbon

dioxide levels include burning fossil fuels



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

precipitates, forming

the levels of carbon

dioxide in the

atmosphere.

sediments. This reduced

Proportions of atmosphere gases in the

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

carbon dioxide + water → 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.



ĥ		
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.	The Earth's ea
Released from volcanic eruptions	Nitrogen was also released, gradually building up in the atmosphere. Small proportions of ammonia and methane also produced.	early atmosphere
	This formed carbonate	

How oxygen increased **How carbon** dioxide decreased

> **Composition and** evolution of the atmosphere

AQA GCSE Chemistry of the atmosphere

Common

atmospheric

pollutants

Toxic, colourless and odourless

gas. Not easily detected, can kill.

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Atmospheric pollutants from fuels

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Human activities and greenhouse gases

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'IXL		Gas	Per	centage	-	0							carbon dioxide	+ water >	glucose + oxygen	PiXL
argon		Nitrogen			gases in atmosph		Algae and p	plants							$C_6H_{12}O_6 + 6O_2$	
nitroge	oxygen	Oxygen Argon Carbon dioxide			gases in the atmosphere	rtions of	Oxygen in atmosph						gradually prod	uce more ox	plants evolved to Tygen. This gradually nabled animals to	
Volcano activity 1 st Billion years	,	(maii form atmo vapo	•	that rly and water ondensed	The Earth's early			carbon decrease	d		Reducing carbon dioxide in the atmosphere			levels in the photosynthe Remains or bottom of	lually reduced the carbone atmosphere by absorbnesis. f biological matter falls to oceans. Over millions of ediment settled on top o	oing it for o the years
Other gases		relea build atmo prop	nethane	dually the Small of ammonia	rly atmosphere		atmospl AQA GO	here CSE			sedimentary rock and fossil fuels		Greenhou	and the hu coal, oil, no The sedim dioxide fro	ge pressures turned the atural gas and sedimenta entary rocks contain cark m the biological matter.	m into ary rocks.
Reducing carbon dioxide in the atmosphere		preci sedir the le dioxi	pitates, f	nis reduced carbon	atr	Common atmospheric pollutants			as greenhouse gases			use	Carbon diox water vapo and metha	ur		
	heric pollu	tants from	fuels	-	rties and spheric p	effe	ects of	gases cycle can b	emitte of a pro oe redu	ed c odu uce	t of greenhouse ver the full life uct/event. This d by reducing oon dioxide and	Global climate change	The greenho	use		
Combustion of fuels											ane.		Human	activities	and greenhouse gas	es
Gases from				Carbon nonoxide						Ef	ects of climate ch	ange	Carbon dioxide			
burning fuels			die	Sulfur oxide and oxides of nitrogen									Methane			
Particulates			Pa	rticulates									Climate change			

اXL'		Gas	Percentage											PiXL _{sci}
ortners in excellence argon	_ [Nitrogen		atn	Prop	Algae and p	lants							
	ovugen	Oxygen		Sou	orti									
	oxygen	Argon		atmosphere	Proportions of gases in the	Oxygen in	the							
nitroge	n	Carbon		P	e of	atmosphe	ere							
		dioxide												
] [<u> </u>		low oxygen		ed	Reducing carbon	1				
Volcano activity				The E		How dioxide	carbon decrease	he	dioxide in the atmosphere					
1 st Billion				Earth's	. \	dioxide			atmosphere					
years				's ea		omposition	on and	\						
				early		evolution	of the		Formation of sedimentary rock					
						atmospl	nere		and fossil fuels	3				
Other gases		atmosphere AQA				AOA CC	·CE							
		lere		AQA GO hemistry					Greenhou	50 G3505				
Reducing				┪┕		atmosph			CO ₂ and meth	nane	Greenilou	se gases		
carbon						истоэрг	icic		as greenhou		Carbon dioxi			
dioxide in the					Cor	nmon			gases		water vapo and methar			
atmosphere					atmo	spheric		Caula au	facturists					
		'			poll	utants			footprints	Glo				
Atmosph	neric pollu	ıtants from fu	els						int of greenhouse over the full life	obal cha	The greenho effect	use		
			<u> </u>			ects of	cycle	of a pro	duct/event. This	bal clima change	enect			
Complemention			atmo	sphe	ric poll	utants			ced by reducing arbon dioxide and	nate				
Combustion of fuels								met	thane.		Human	activities and	l greenhouse gase	es .
			Carbon						Effects of climate cha	ange	Coult au			
			monoxide					•	inects of children	unge	Carbon dioxide			
Gases from			Sulfur											
burning fuels			dioxide and								Methane			
			oxides of nitrogen											
Particulates			Particulates								Climate change			