

## Topic Overview

# Climate and Earth Resources



### KNOW IT

- [I know about the greenhouse effect and how it causes global warming](#)
- [I know how carbon is recycled](#)
- [I know about the causes and effects of global warming](#)
- [I know how metals are extracted to make pure metals](#)
- [I know about the importance of recycling materials](#)



### LINK IT

This topic links with the Earth topic and the Metals and Non-Metals topic you did in Year 7



### PROVE IT

- DIRT task – The Carbon Cycle
- Extended Response Question – Extracting Metals
- End of unit test

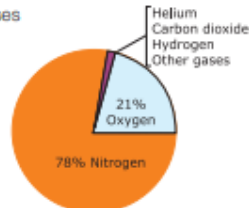
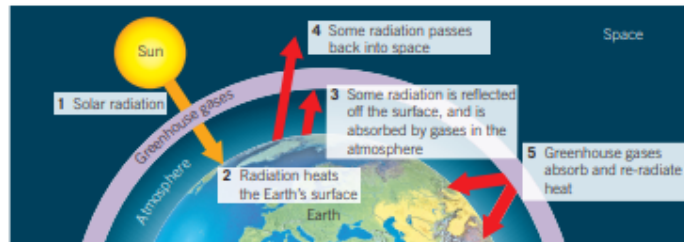


### SAY IT

VOCABULARY	DEFINITION
atmosphere	The air around us
Carbon cycle	The processes through which carbon is transferred to different stores
Climate change	Long term changes to weather patterns
combustion	Burning fuel in oxygen
electrolysis	Separating a compound using electricity
Fossil fuels	Coal, oil and gas. Formed over millions of years from the remains of dead plants and/or animals
Global warming	The gradual increase in temperature of the Earth
Greenhouse gases	Gases in the atmosphere that trap radiation from the Earth
	Naturally occurring metals and their compounds
	Materials or substances that are produced by the environment
ore	A naturally occurring rock which contains enough of a mineral to be worth extracting
photosynthesis	The process by which plants use energy from the sun to make food
recycle	The collecting and processing of materials that have been used so that the resources can be used again
respiration	A chemical reaction that happens in all living cells, including plant cells and animal cells. It is the way that energy is released from glucose

## The atmosphere

- The air around us all of the time is known as the **atmosphere**, it is made up of a mixture of gases
- When the Sun heats the Earth's surface, some of the radiation is absorbed and some is reflected back into space
- Some of the gases in the atmosphere absorb radiation that is about to be reflected into space, this keeps the Earth at a warmer temperature than it would be without the atmosphere, this is needed as otherwise it would be too cold for life
- The gases in the atmosphere which absorb and trap this radiation are known as **greenhouse gases**, the most commonly known greenhouse gases are carbon dioxide and methane

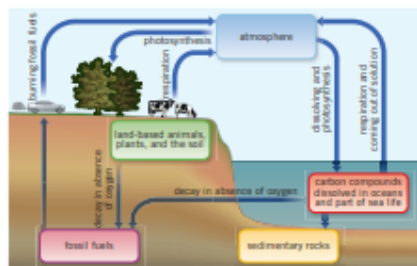


## Global warming

- Global warming** is the gradual increase in temperature of the Earth
- This is closely linked to the rise in carbon dioxide levels in the atmosphere

## The carbon cycle

- The **carbon cycle** is the processes by which carbon is naturally transferred to different stores through a range of natural processes
- Carbon is released into the atmosphere through **combustion of fossil fuels**, and animal **respiration**
- It is then reabsorbed by plants during **photosynthesis**



## Climate change

- Long term changes to weather patterns are known as **climate change**
- This can cause the ice caps to melt, leading to sea levels rising and flooding of low level land
- Graphs alone cannot confirm that humans are the cause, but the majority of scientists now believe that human activity is a very likely cause
- We can help to prevent climate change by:
  - Using renewable energy resources
  - Using cars less
  - Buying and wasting less resources

## Extracting metals

- Metals are a **natural resource**, with most being found joined with other elements in compounds
- Naturally occurring metals and their compounds are known as **minerals**
- An **ore** is a naturally occurring rock which contains enough of a mineral to be worth extracting
- An example of an ore is Bauxite, which contains aluminium hydroxide

- When metals are extracted they first have to be separated from other minerals in the ore, then they need to undergo a chemical reaction to separate them from the other element that they are joined to in a compound
- If a metal is below carbon in the reactivity series, it can be extracted by reacting it with carbon in a displacement reaction
- As carbon is more reactive it will take the place of the metal in the compound, leaving the metal on its own:
 
$$\text{carbon} + \text{metal oxide} \rightarrow \text{metal} + \text{carbon dioxide}$$

$$\text{carbon} + \text{copper oxide} \rightarrow \text{copper} + \text{carbon dioxide}$$
- If the metal is above carbon in the reactivity series, **electrolysis** can be used, this involves separating the metal by using electricity

### Reactivity series

magnesium  
aluminium  
carbon  
zinc  
iron  
lead  
copper

## Recycling

- Recycling** is the collecting and processing of materials that have been used so that the resources can be used again
- Recycling can have both advantages and disadvantages:

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Resources will last longer</li> <li>It uses less energy than extracting new materials</li> <li>It reduces waste and pollution</li> </ul>	<ul style="list-style-type: none"> <li>Separating rubbish can be seen as a nuisance</li> <li>The lorries collecting recycling produce pollution</li> <li>Some materials are easier to recycle than others</li> </ul>

**Key terms** Make sure you can write definitions for these key terms.

atmosphere carbon cycle climate change combustion electrolysis fossil fuel global warming greenhouse gas mineral  
natural resource ore photosynthesis recycling respiration