



The Carbon Cycle

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Fossil Fuels:

bbc.co.uk/education/clips/zdx4wmn

Climate Change:

bbc.co.uk/education/clips/zg7d39q

We know trees are great at storing carbon, but where does it come from and where does it go? Let's explore the Carbon Cycle to find out more!

All life on Earth is carbon based, and carbon is constantly moving from one part of the planet to another through a process called the **Carbon Cycle**.

How does carbon go from one place to another?

Carbon is transferred through many different **processes** including:

- **Photosynthesis** – A process where plants use carbon dioxide (CO₂) and energy from the sun to make sugars and the O₂ that we and other animals need to survive. Whilst we typically only think of trees, flowers and grasses when we think of plants, there are also lots of different types of plants in our oceans, such as algae, that are able to photosynthesise.
- **Burning fossil fuels** – Humans burn fossil fuels, coal, oil and gas, to generate power and electricity. This happens in oil refineries, factories, car engines and planes across the world, releasing a large amount of 'greenhouse gases', including CO₂, into the atmosphere. Most scientists agree that this is fuelling **climate change**. Had the fuel not been burnt and released into the atmosphere, the carbon would have remained buried under the ground.





Where is carbon stored?

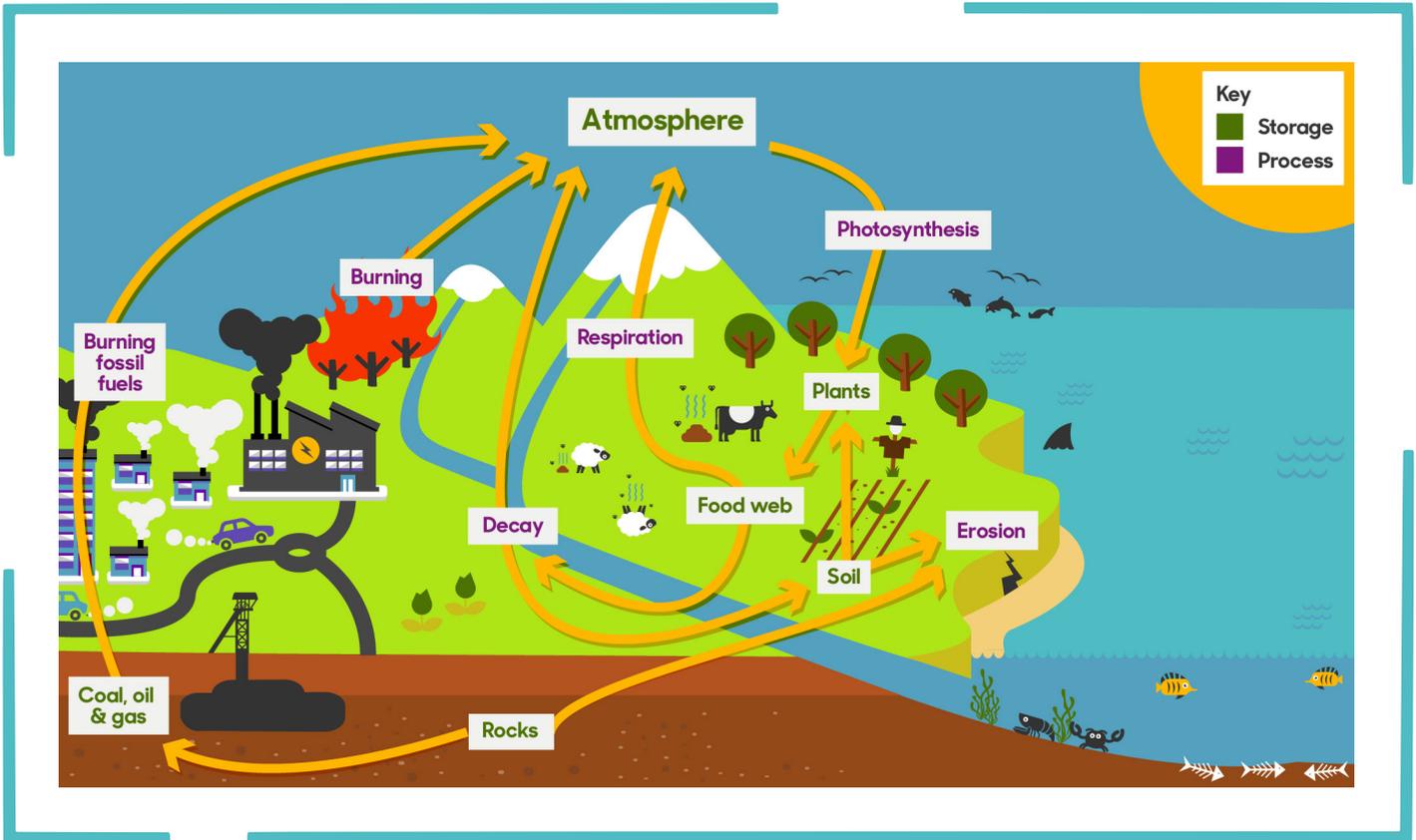


There are several different **carbon stores**, including:

- **Plants** – Trees store carbon in their trunks, leaves and roots. Every day, tonnes of CO₂ are released into the atmosphere. Plants remove 1/4 of this CO₂ by photosynthesis, using the energy of the Sun to create sugars from the carbon and releasing oxygen as a by-product. An incredible 600 billion tonnes of carbon are thought to be stored in land plants alone.
- **Atmosphere** – The atmosphere holds around 750 billion tonnes of carbon, mainly as CO₂. Human activity such as burning fossil fuels and deforestation (cutting down trees) is contributing to, what most scientists agree are, dangerously high levels of CO₂ in our atmosphere. Cutting down large areas of forest is a problem as the trees would otherwise have helped to remove CO₂ from the atmosphere.
- **Fossil fuels (coal, oil and natural gas)** – Millions of years ago, organisms containing carbon, such as trees and ocean-dwelling creatures, died and were buried. Because these organisms were buried, they weren't able to decompose properly. Over millions of years, the pressure from being buried under tonnes of material meant that these organisms were turned into fossil fuels. As we burn these fossil fuels, we release carbon that has been stored in the Earth for millions of years into the atmosphere, as CO₂. This means we are adding extra carbon to the cycle which would otherwise have remained stored in the Earth.



We have simplified this diagram to only focus on land-based carbon movement, but can you think of other places you may find carbon? Hint: Only 29% of our planet is land!

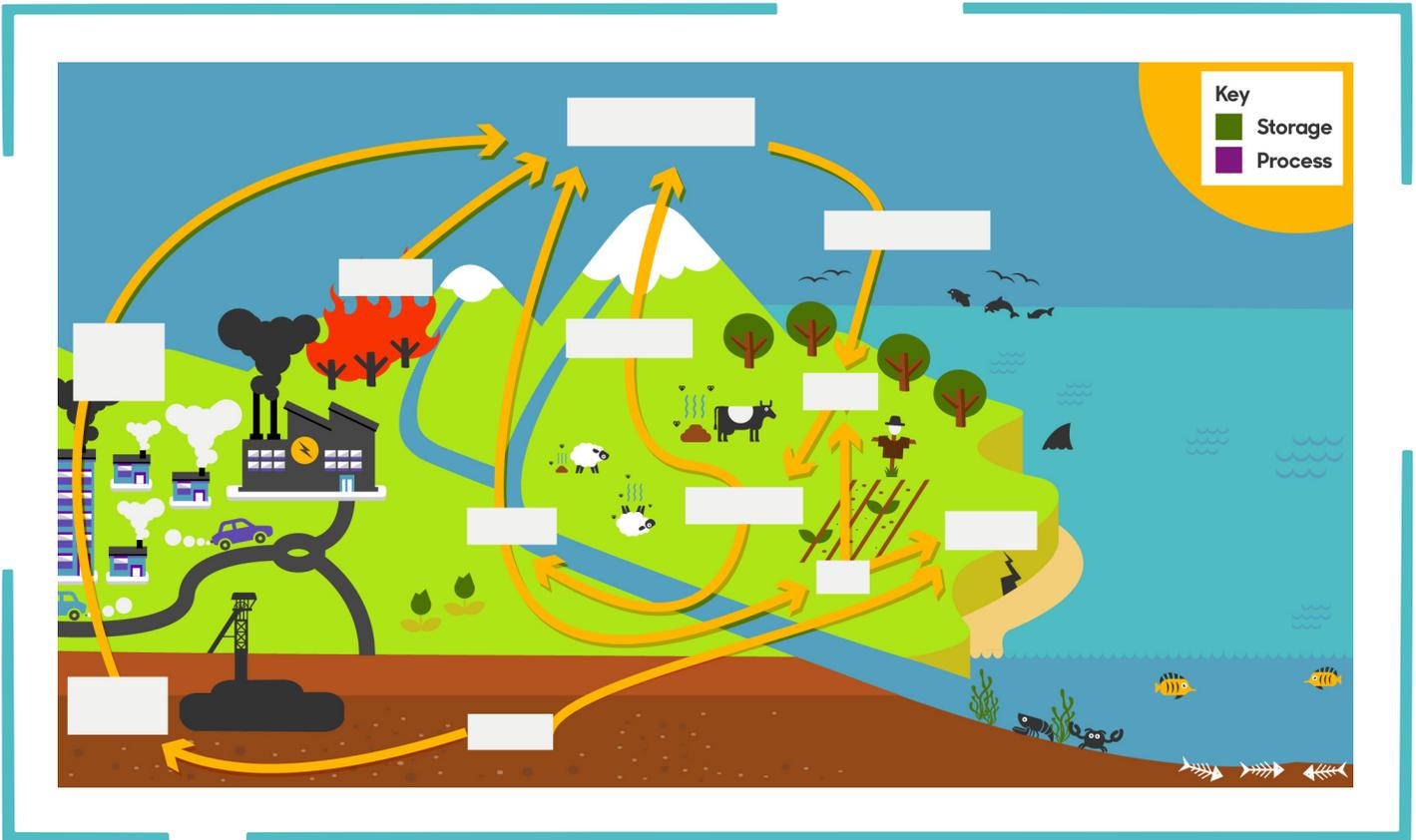


The Carbon Cycle diagram above shows more stores and processes.

- Which processes do you think help to move the most carbon around the cycle?
- Which stores do you think can hold the most carbon?
- Are there any processes that could be prevented?



Now you have explored the land-based Carbon Cycle, why not see if you can label the diagram?



Remember to write down whether it is Carbon Storage or a Carbon Process, using the key in the top-right corner.