

6 What types of activities lead to carbon being released as a gas?

7 Name one type of 'inorganic' carbon.

8 Name two types of 'organic' carbon.

9 What does equilibrium mean?

10 Why do you think this balance is so important?

THE CARBON STORY

What is carbon and where does it come from?

'Weather' describes the combination of wind, rain, temperature and other natural atmospheric conditions we experience at a particular time and place.

Climate is the pattern of weather of an area averaged over many years.

So, if we have extremes in weather conditions, such as a long summer drought or a very cold winter, it doesn't necessarily mean that the climate is changing. We can only show whether or not climate change has occurred after decades of careful measurements and analysis.

The climate system has many components that can alter. For example, if the amount of solar energy absorbed on the Earth's surface were to increase, then the surface temperature would increase.

This, in turn, would lead to a decrease in the amount of snow cover. As snow reflects more solar energy than land, vegetation or water, a decrease in the amount of land covered by snow would allow more solar radiation to be absorbed. This is called positive feedback.

Carbon is a crucial element for all life on Earth. It is also present in plants and rocks, the atmosphere and the oceans. Carbon therefore moves, or 'cycles', between each of these things and is redistributed between carbon dioxide 'sources' (*given off*) and 'sinks' (*stores*). Carbon is an interesting chemical because we don't always know where these sinks and sources are!

<https://www.bgs.ac.uk/discoveringGeology/climateChange/general/carbonStory.html>



deposits may be formed into limestone rocks.

Carbon dioxide levels in the atmosphere depend on a balance (equilibrium) between carbon dioxide sources and sinks: sources give out carbon dioxide and sinks absorb and store carbon.

Greenhouse gases are actually crucial to keeping our planet at a habitable temperature. Without them, the Earth would be about -17°C.

Anthropogenic or human release of carbon dioxide contributes to the current enhanced greenhouse effect.

A greenhouse gas is so called because it absorbs infrared radiation emitted by the Earth's surface (this radiation originally came from solar radiation), in the form of heat, which is circulated in the atmosphere and eventually lost to space.

Greenhouse gases also increase the rate at which the atmosphere can absorb short-wave radiation from the sun, but this has a much weaker effect on global temperatures. Greenhouse gases in our atmosphere are:

- carbon dioxide
- water vapour
- methane
- nitrous oxide
- ozone
- CFCs.

Carbon Cycle



There is a continuous two-way flow of carbon between the organic and inorganic forms. Carbon can be released/ taken in as gas during respiration by both plants and animals to maintain their bodily functions. A

More than 99 per cent of the carbon in the carbon cycle is found in the Earth's crust. Carbon is added to, or removed from, this carbon 'reservoir' only slowly, so much of the carbon is essentially locked in the earth.

Most of the carbon in the crust has a biological origin, deposited on the ocean floor from the remains of the many marine organisms that use calcium carbonate in their skeletons. After consolidation, these

11 What might happen if there were no greenhouse gases at all?

12 How might the world be different without them?

13 What does Anthropogenic mean?

14 What is absorbed by greenhouse gases?

15 Name 3 greenhouse gases. (*Do not put their chemical symbols too!*)

16 Do you think it is 'better' to have carbon stored in the ground or as a gas in the air? Explain your thinking.

1 What is the difference between weather and climate?

2 What do we need to look at to be sure that the climate is changing?

3 Create a short flow diagram to show what would happen if the amount of heat absorbed by the sun increased.

4 What is the difference between a carbon source and a carbon sink?