Your notes

GCSE Chemistry: revision notes

Greenhouse gases and climate change

Contents

1. The greenhouse effect
2. Human activities
3. Effects of climate change
4. Carbon footprints
5. Key terms
6. Quick questions
7. What to do next

The greenhouse effect

- **Greenhouse gases** such as water vapour, carbon dioxide and methane keep the Earth warm enough to support life.
- Radiation from the Sun (mainly short wavelengths) passes through the atmosphere and warms the Earth's surface.
- The Earth radiates energy as infrared radiation (longer wavelength). **Greenhouse gases** absorb some of this and re-emit it in all directions, warming the atmosphere.

Human activities

- Burning fossil fuels and deforestation increase the amount of carbon dioxide in the atmosphere.
- Animal farming (digestion and waste) and decomposing rubbish in landfill sites increase the amount of methane.
- Based on peer-reviewed evidence, many scientists believe human activities are causing the Earth's surface temperature to rise, resulting in global **climate change**.
- Climate models are simplified and there is uncertainty; the media may give oversimplified or biased reports.

Effects of climate change

- Sea levels rise, causing flooding and coastal erosion.
- Storms become more frequent and severe.
- The amount, timing and distribution of rainfall change.

- Temperature and water stress for humans and wildlife; changes in the food-producing capacity of some regions; changes to the distribution of wildlife species.

Carbon footprints

- A **carbon footprint** is the total amount of carbon dioxide and other **greenhouse gases** emitted over the full life cycle of a product, service or event.
- Ways to reduce it: using renewable or nuclear energy, saving energy, **carbon capture and storage**, carbon taxes and licences, **carbon offsetting** (such as planting trees) and carbon-neutral products.
- Problems: scientific disagreement, lack of public information, reluctance to change lifestyles, economic costs, and incomplete international cooperation.

Key terms

Greenhouse gas	A gas, such as carbon dioxide, methane or water vapour, that absorbs infrared radiation.
Greenhouse effect	The warming of the atmosphere by greenhouse gases absorbing and re-emitting infrared radiation.
Global warming	The increase in the Earth's average surface temperature.
Climate change	Long-term changes in weather patterns, linked to global warming.
Carbon footprint	The total greenhouse gases emitted over the full life cycle of a product, service or event.
Carbon capture and storage	Collecting carbon dioxide from power stations and storing it underground.
Carbon offsetting	Balancing emissions by actions such as planting trees.
Peer review	Checking of scientific work by other experts before it is published.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which of these is a greenhouse gas?
2. What type of radiation do greenhouse gases absorb?
3. Which human activity increases carbon dioxide levels?
4. Which human activity increases methane levels?
5. What is a carbon footprint?
6. Which of these is an effect of climate change?
7. What is carbon capture and storage?
8. Why is it hard to reduce carbon footprints?

Your notes

Answers

1. Methane
2. Infrared radiation from the Earth
3. Burning fossil fuels
4. Animal farming
5. The total greenhouse gases emitted over the life of a product, service or event
6. Rising sea levels
7. Collecting carbon dioxide and storing it underground
8. It is expensive and needs international cooperation

What to do next

Practise 10 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

Your notes