

Greenhouse Gases Climate Change

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Explain how greenhouse gases keep the Earth warm. (3 marks)

Step 1 · In

Short-wavelength radiation from the Sun passes through the atmosphere and warms the Earth's surface.

Step 2 · Out

The Earth radiates long-wavelength (infrared) radiation back towards space.

Step 3 · Trapped

Greenhouse gases absorb some of this infrared radiation and re-emit it in all directions, including back towards the Earth, keeping it warmer.

Answer: Greenhouse gases absorb and re-emit outgoing infrared radiation

Check: Without the greenhouse effect the Earth would be too cold for most life.

2. Now try one with the steps

Give two human activities that increase methane in the atmosphere. (2 marks)

Step 1 · Farming

Step 2 · Waste

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Name three greenhouse gases. [3]

2. Explain how the greenhouse effect warms the Earth. [3]

3. Give two human activities that increase carbon dioxide in the atmosphere. [2]
-
-
4. Give two human activities that increase methane in the atmosphere. [2]
-
-
5. Give two possible effects of global climate change. [2]
-
-
6. Define the term carbon footprint. [1]
-
-
7. Give two ways of reducing a carbon footprint. [2]
-
-
8. Atmospheric CO₂ was 317 ppm in 1960 and 414 ppm in 2020. Calculate the increase in ppm. [1]
-
-
9. Calculate the mean rate of increase in ppm per year between 1960 and 2020, to 2 significant figures. [2]
-
-
10. Calculate the percentage increase in CO₂ from 1960 to 2020, to 3 significant figures. [2]
-
-
11. A car emits 120 g of CO₂ per km. It is driven 150 km per week. Calculate the CO₂ emitted per week in kg. [2]
-
-
12. Explain why it is difficult to model the climate and make predictions. [2]
-
-
13. Explain why peer review is important for evidence about climate change. [1]
-
-

14. Calculate the mass of CO₂, in kg, produced by burning 1.0 kg of methane completely. CH₄ + 2O₂ → [3]
CO₂ + 2H₂O (C = 12, H = 1, O = 16)

4. Before you hand it in

"The ozone hole causes global warming."

Ozone depletion lets more UV reach the ground; climate change is caused by increased greenhouse gases.

"Greenhouse gases trap the Sun's rays."

They absorb the long-wavelength infrared emitted by the Earth.

"Weather and climate are the same."

Climate is the long-term average; look at trends over decades.