

C6.3.3 Climate change

(C6.2.3 Combined Science)

Previous knowledge

Carbon dioxide is produced from the combustion of fossil fuels

Answer the quiz questions

What is happening in this picture and why?



Learning objectives

Describe what the greenhouse effect is

Describe problems caused by global warming

Suggest ways to reduce global warming

Key definitions

Greenhouse effect – interaction of infrared radiation with molecules in the atmosphere, reducing the transfer of energy to space.

(Certain chemicals absorb heat energy which would normally escape into space.)

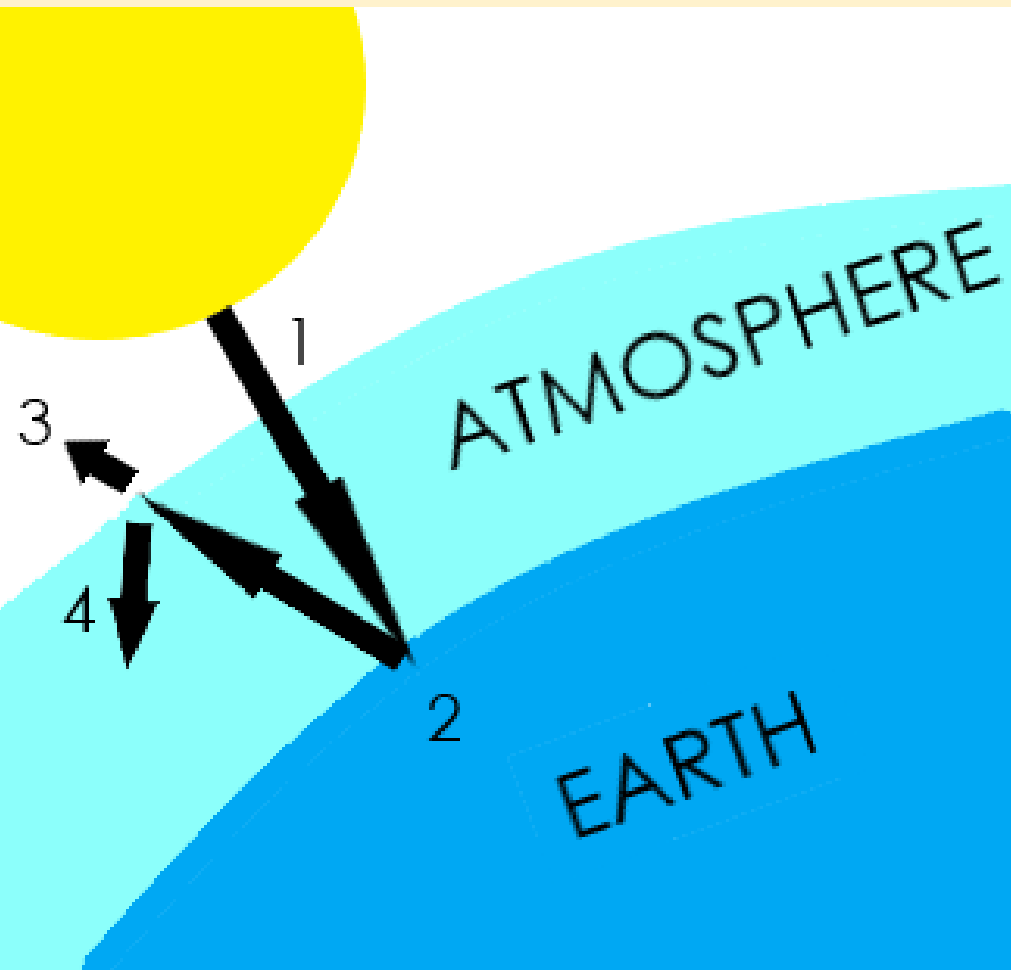
Greenhouse gas – gas in the atmosphere that reduces the transfer of energy to space by infrared radiation.

Global warming – the increase in the **average** global temperature due to increased amounts of greenhouse gases

Climate change – a change in the pattern of the weather, due to global warming

TASK 1: The greenhouse effect

Copy this diagram to show the greenhouse effect. Add the labels to the correct place (numbers 1-4) to explain each step. Use your textbook to help if you are not listening to the video.



Some of the heat energy re-emitted from the earth escapes into space.

Heat energy from the sun enters the earth's atmosphere

Heat energy is absorbed by the earth. Some of it is re-emitted as a different wavelength. This is infrared radiation.

Greenhouse gas molecules absorb some of the infrared radiation and then re-emit it in all directions, warming the Earth's surface and atmosphere.

The greenhouse effect occurs naturally. Without it, the Earth would not be a temperature that could support humans.

There are natural sources of greenhouse gases but human activity is leading to an increase.

TASK 2 - Use the list below to complete the table. For each human activity, suggest at least one way to reduce the impact of this activity.

- evaporation from sea water
- burning hydrocarbon fuels
- decomposing plant material
- burning coke (mainly carbon)
- cattle rearing
- respiration

Greenhouse gas	Natural source/process	Human activity
methane		
water vapour		
carbon dioxide		

Problems caused by global warming

These pictures show the possible effects of global warming

TASK 3: Write a list of the effects of global warming.



Reducing the impact of global warming

Use less fossil fuels

- Biofuels release carbon dioxide when they are burnt, but when the crops are grown, they use up carbon dioxide through photosynthesis

Carbon capture

- Carbon emissions can be captured and stored at the point of emission

Use renewable sources of energy to generate electricity

Extension Task

Carbon footprint - the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organisation, or community.

List your daily activities that may contribute to your carbon footprint. Consider the follow:

- How often do you use transport that requires fossil fuels?
- How often is the heating on in your house?
- How long do you shower for? How often do you have a bath?

How could you reduce your carbon footprint?

Answer the quiz questions