

## Earth

## 3. Climate

## CONCEPT 3

## LESSON GUIDE

## GLOBAL WARMING

## PRECISE LEARNING POINTS

## KNOW

I know how to describe the greenhouse effect.

## APPLY

I can apply my knowledge to explain how human activity has affected the greenhouse effect.

## EXTEND

I can extend my knowledge to explain global warming.

## NOTES

The greenhouse effect is a necessary natural phenomenon. It enables the Earth to be warm enough to support life. Without it, the temperature of the Earth would be  $-18^{\circ}\text{C}$ .

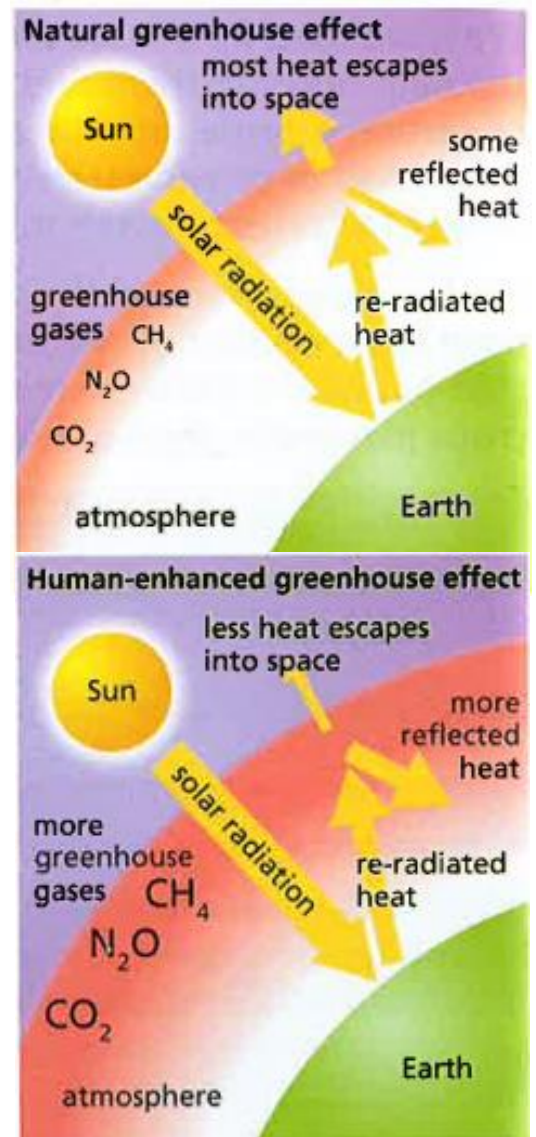
The Sun's radiation passes through the Earth's atmosphere. Some is absorbed by the Earth's surface and is then re-radiated back out as heat. Most of this heat escapes into space. However, some of the heat that is re-radiated is absorbed or reflected by the greenhouse gases in the atmosphere. This causes the atmosphere to warm up.

Sadly, human activities have now led to higher concentrations of greenhouse gases in the atmosphere. Scientists think that this has thrown the normal greenhouse effect off balance, causing an 'enhanced greenhouse effect'. The atmosphere is trapping too much heat and global warming is now occurring.

Global warming is a rise in the global mean temperature. This can result in climate change.

The effects of climate change include:

- Melting of the polar ice sheets
- Rising sea levels
- Submersion of low-lying areas of the world
- Habitat loss
- Less availability of water in some areas
- Food shortages
- Drought
- Desertification
- Longer growing seasons in temperate regions
- Faster growth of some crop species due to increased carbon dioxide concentrations



- Agricultural pests thriving in warmer environments
- Tropical diseases, such as malaria, affecting a larger area
- An increase in severe weather events

Scientists agree that the Earth's temperature has risen over the last century. They also agree that carbon dioxide is one of the greenhouse gases that enables global warming. However, some scientists disagree about whether global climate change is part of a normal cycle or not. They also disagree about how big of a problem it could become.

The Earth's average temperature has increased by 0.5°C over the last 100 years. We predict it will rise by between 1.4°C and 5.8°C in the next 100 years.

The Earth's climate has changed throughout history. However, the current rate of change has not been seen in the last 10,000 years.

Most research seems to support the idea that human activities are accelerating global warming.