

## 6.19 Introducing climate change

**Topic:** Conservation

**Subtopic:** Climate change

**Activity type/skill:** Orientation

**Literacy focus:** Vocabulary

### Objective

- Provide orientation to the subtopic.
- Make links with prior knowledge.
- Link to the science and social studies curricula.
- Present target vocabulary in context.

### What you need

- Student worksheet (see next page)
- [Audio track 6.19a](#)
- [Audio track 6.19b](#)
- [Audio track 6.19c](#)

### What to do

1. Look at the first page of the student worksheet. Write the questions on the board then talk about them one by one to draw out any previous knowledge students may have on climate change and the greenhouse effect. Note their contributions and have them copy them in their worksheets. Come back, check these and adapt when they have finished this section.
2. Look at the second page of the student worksheet and talk about the graphics before students listen. Talk about the list of gases in the air and the ones that are greenhouse gases, the labelled sketch of a greenhouse and the diagram showing the greenhouse effect.
3. Play track 6.19a (Track 3 for this topic) and have students listen and look at the graphics. The text for this track is not printed on the worksheet. Have students explain the diagram to you or to a partner. Listen again if they need to.
4. Look at the third page of the student worksheet. Play track 6.19b (Track 4 for this topic). Students read as they listen. Talk about the balance between CO<sub>2</sub> released and CO<sub>2</sub> stored in the natural process.
5. Look at the fourth and fifth pages of the student worksheet. Play track 6.19c (Track 5 for this topic). Listen and read, then have students write the names of the greenhouse gases in the boxes at the top of the arrows in the diagram.

Answers:

carbon dioxide          nitrous oxide          methane

### Extending the activity

- Look for interactive material on the internet, for example, [www.epa.gov/climatechange/kids/index.html](http://www.epa.gov/climatechange/kids/index.html) and [www.bbc.co.uk/schools/ks3bitesize/science/environment\\_earth\\_universe/changes\\_in\\_environment/revise6.shtml](http://www.bbc.co.uk/schools/ks3bitesize/science/environment_earth_universe/changes_in_environment/revise6.shtml).

What is it?



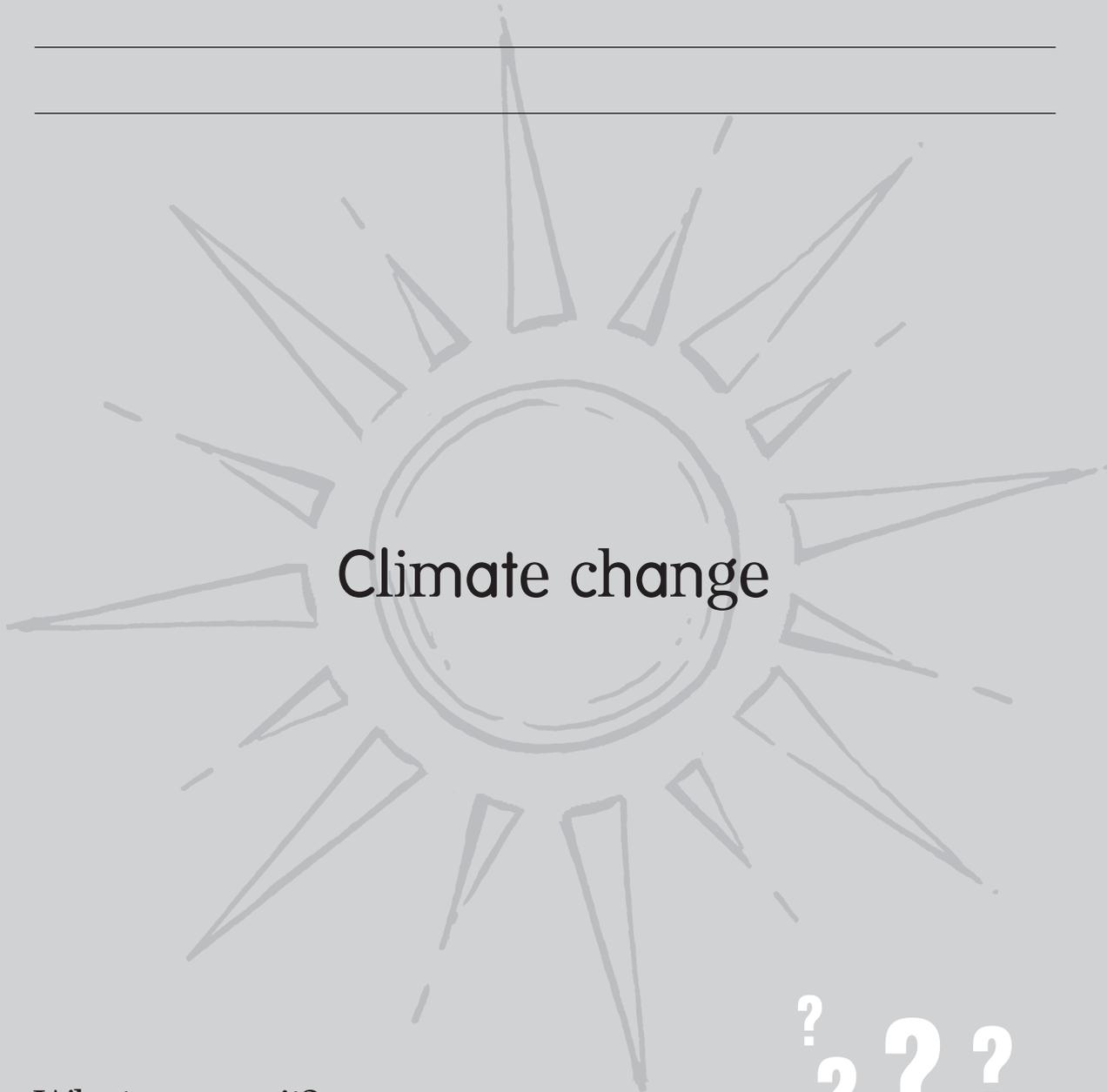
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Climate change



What causes it?



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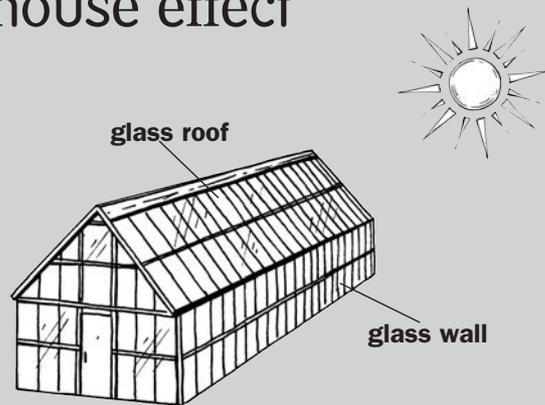
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# The greenhouse effect

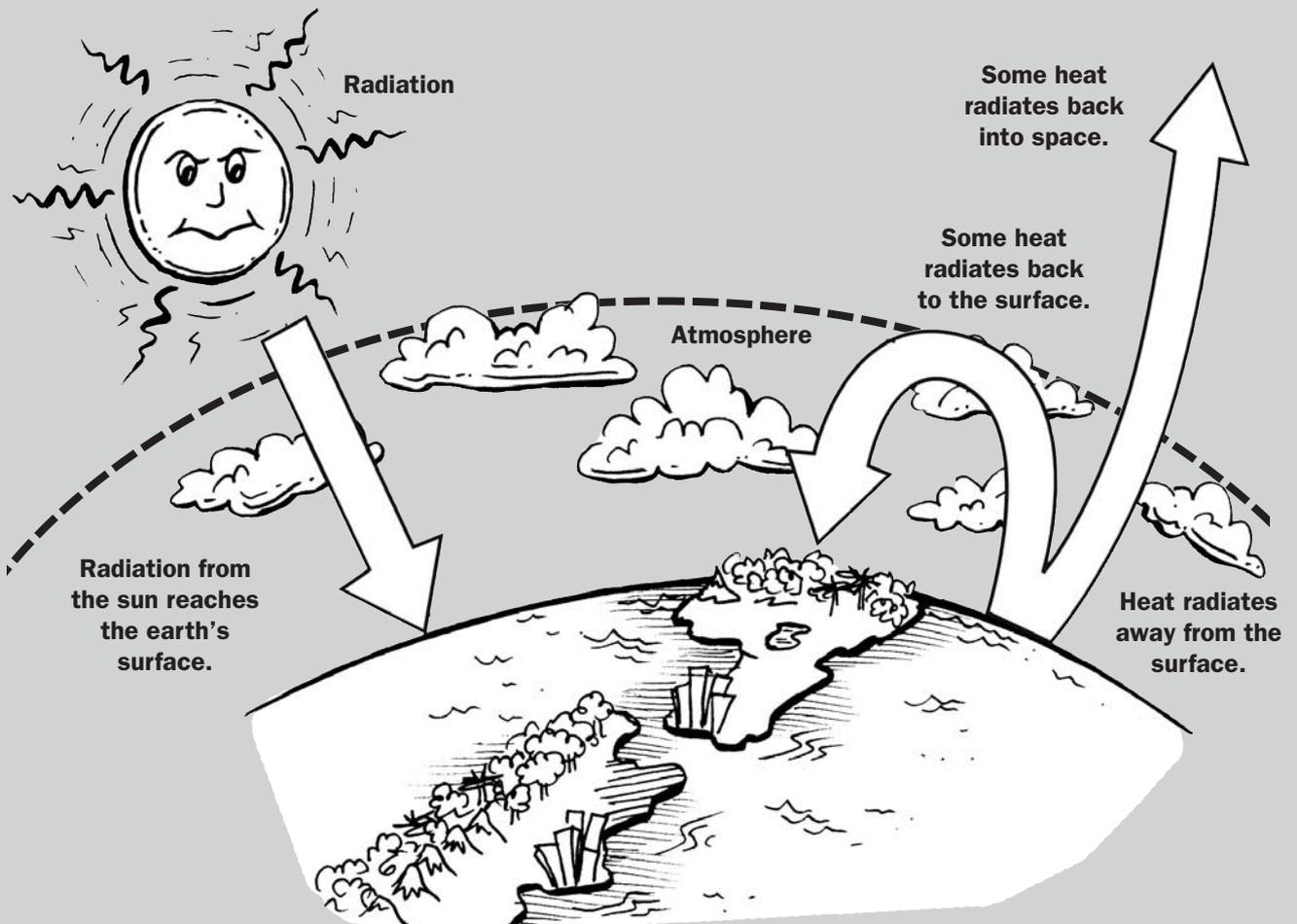
A greenhouse



Scientists tell us that air has:

- 21% oxygen
- 78% nitrogen
- 0.1% - 2% water vapour in the air and as clouds
- 0.36% carbon dioxide (CO<sub>2</sub>) and small amounts of other gases including methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).

**greenhouse gases**





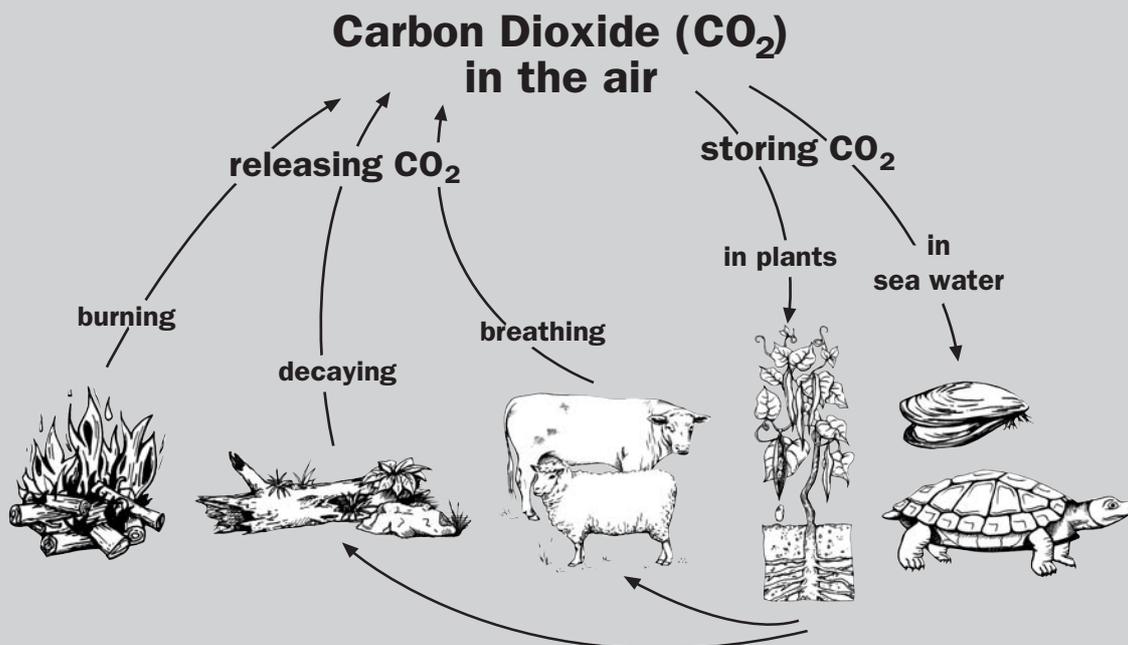
## Where do greenhouse gases come from?

### The natural process

The atmosphere naturally contains a small amount of greenhouse gases. People and animals breathe in oxygen and produce carbon dioxide. Plants release carbon dioxide too, when they die and decay, or burn.

Some carbon dioxide stays in the air and some is stored in plants, seashells and sea water. Living trees and plants release oxygen back into the air. In the past there was a natural balance between the amount of carbon dioxide stored in the air and the amount of carbon dioxide released into the air.

## Natural Process





## Human activity

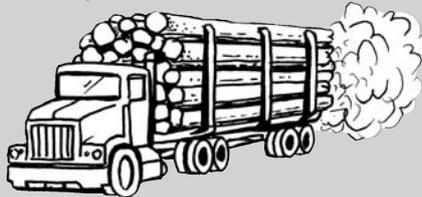
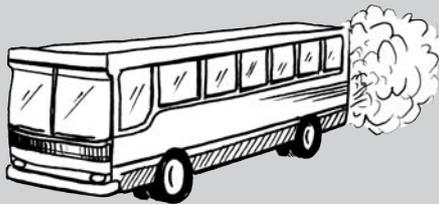
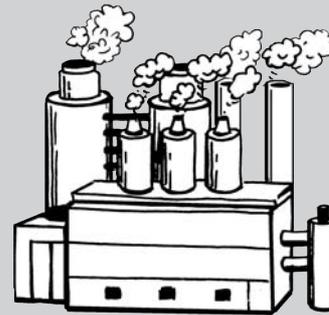
Small quantities of greenhouse gases are produced naturally.

Increasing quantities of greenhouse gases are produced from human activity.

### Carbon Dioxide (CO<sub>2</sub>)

Carbon dioxide is the most common greenhouse gas.

Carbon dioxide is produced by burning fuels like coal, oil and gas to make electricity for houses and factories.



Transport causes the biggest increase in greenhouse gases. There are more and more cars, trucks and buses on our roads. These release large quantities of carbon dioxide. The bigger the engines, the more carbon dioxide they produce.

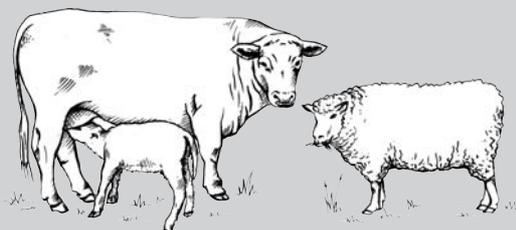
In the past, forests helped prevent too much carbon dioxide being released into the atmosphere.

Trees and plants store carbon dioxide and use it to help them make food. But today forests are being destroyed. This results in more carbon dioxide in the air.



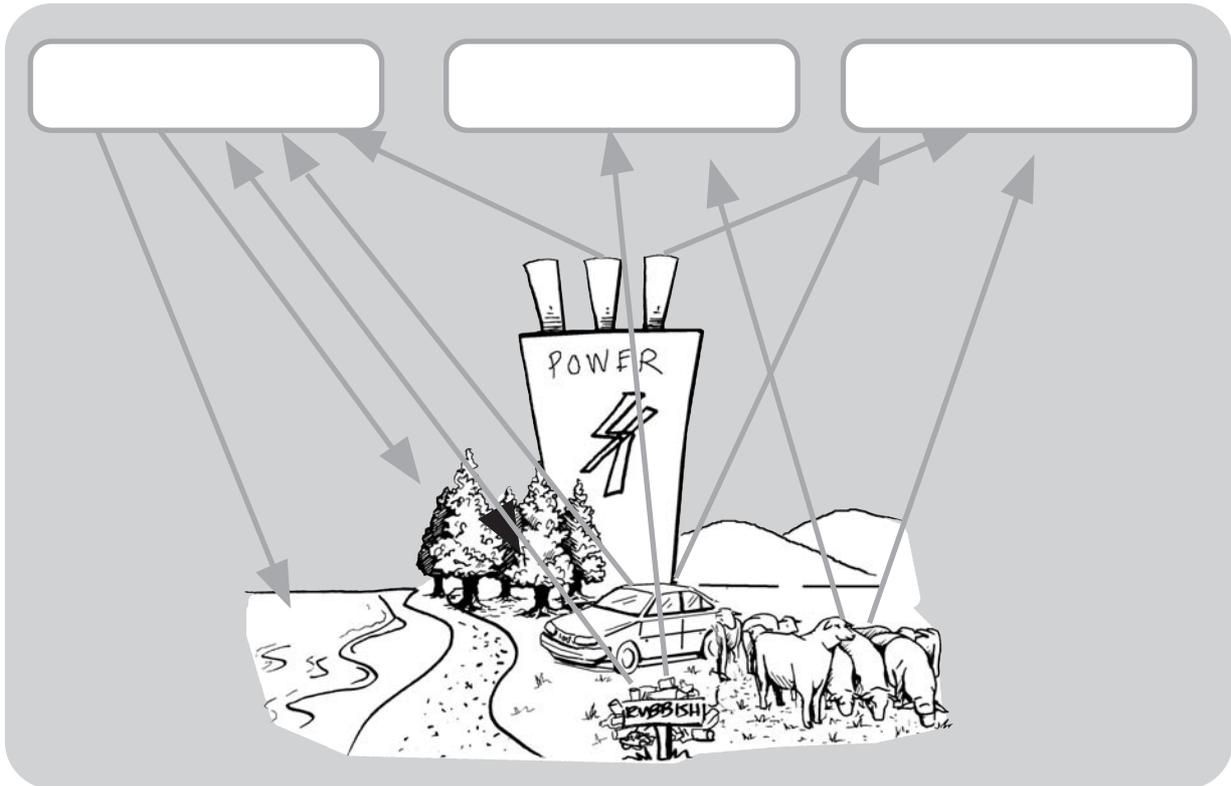
### Methane (CH<sub>4</sub>)

Methane comes from farm animals and decaying rubbish. Methane is produced in the stomachs of animals that eat grass. Millions of farm animals release methane into the air every day.



## Nitrous Oxide (N<sub>2</sub>O)

Nitrous oxide is produced by burning fuels like oil, coal and gas. It also comes from fertilisers used in agriculture.



Greenhouse gases trap heat from the sun and act like a blanket that makes the air warmer. The more greenhouse gases we put into the air, the thicker the blanket becomes. The earth is becoming warmer and the climate will change. Scientists estimate that the average temperature will rise between 1.4 °C and 5.8 °C in the next 100 years. This process is called global warming.