



The Greenhouse Effect

Age: 7-14

Topic: Energy Sources
and Sustainability

Time: 30 minutes



Overview

This is a simple hands-on demonstration of the physical process that keeps our world warm enough to sustain life i.e. the greenhouse effect.

The gases in the earth's atmosphere work similarly to the glass in a greenhouse in that they trap the warming IR radiation from the sun whilst any unabsorbed or reflected UV radiation can pass back out.

In the jar the air is trapped and unable to mix with cooler surrounding air, so the temperature rises inside.

The problem on earth is the accumulation of additional greenhouse gases like CO₂ due to human activities. This upsets the natural balance and the planet's temperature rises leading to long-term climate change.

What equipment will I need?

- A kilner jar (or other glass jar tall enough for a thermometer to fit)
- 2 x thermometers
- 2 x sheets of black card
- Paper and pencil to record results
- Timer
- Sunshine

How will learners explore this?

1. Ensure the two thermometers start at the same temperature by placing them side by side in the shade until this is achieved.
2. Identify an exposed sunny spot to conduct the experiment.
3. Place one thermometer inside the jar and screw the lid on. Place the jar on a sheet of black card. If the lid is opaque upturn the jar so that the lid doesn't cast a shadow.
4. Place the second thermometer outside and next to the jar on another sheet of black card (the card controls for effects of the material/ground - see if students can guess this).
5. Create a table

Time	Temperature in glass	Temperature in the air

6. Make a hypothesis and then record the temperature of both thermometers at regular intervals.
7. Discuss how the jar affects the temperature. Why? How does this reflect the CO₂ increase and its role as a greenhouse gas?

