

The greenhouse effect

- Energy
- Sustainability
- Climate change



Previous learning required

- Experience of taking a reading with a thermometer.
- Familiarity with the terms greenhouse gas, global warming, and climate change.

Learning outcomes

- To understand the role natural greenhouse gases play in trapping warm air in the Earth's atmosphere.
- To understand that, due to human activity, an increased amount of greenhouse gases in the Earth's atmosphere is linked to global warming and climate change.

Equipment

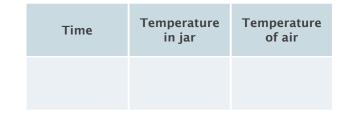
- A kilner jar (or other lidded glass jar tall enough to fit a thermometer inside)
- 2 x thermometers
- 2 x sheets of black card
- Paper and pencils to record results
- Timer
- Sunshine

Activity

- 1. Identify an exposed sunny space to conduct the experiment outdoors.
- 2. Ensure the two thermometers start at the same temperature by placing them side by side in the shade until this is achieved.
- **3**. Place one thermometer inside the jar and close the lid before placing the jar on a sheet of black card. If the lid is opaque, upturn the jar so the lid doesn't cast a shadow.
- 4. Place the second thermometer outside and next

to the jar on another sheet of black card.

- 5. Discuss what the card is for with pupils (to control the effects of temperature change linked to the surface beneath the jar).
- 6. Encourage pupils to hypothesise about the likely outcome of the experiment before recording the temperature of both thermometers at regular intervals. Ask pupils to record the data in a table:



Check for understanding

- 1. Discuss the results with your pupils. Why is the temperature hotter inside the jar?
 - The air trapped inside the jar is unable to mix with the cooler air surrounding it, causing the temperature to rise.
- 2. How is this similar to the effect the increased amount of greenhouse gases in the Earth's atmosphere is having on our planet?
 - The gases in the Earth's atmosphere work similarly to the glass of the jar (or a greenhouse). They trap the warming rays from the sun whilst any unabsorbed or reflected UV radiation can pass back out.
 - The accumulation of additional greenhouse gases from human activity (for example, CO2) upsets the natural balance, leading to global warming and climate change.

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OUTDOOR CLASSROOM DAY

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