

## Investigation 4 Hot house

The greenhouse effect: what is it and how can it impact on our lives? Here's an experiment to show you the principles behind this phenomenon.

**YOU WILL NEED** Four cups of compost • Two one-litre plastic bottles • An elastic band • Two thermometers • A lamp • Some cling film • Two pieces of cardboard •

- 1 Cut both bottles in half and keep the lower portion.
- 2 Fill each of these containers with two cups of compost.
- 3 Place a thermometer in each bottle and cover the bulb area of the thermometer with cardboard to prevent it receiving direct light from the lamp.
- 4 Seal one of the containers with cling film and hold it in place with an elastic band.
- 5 Take the temperature of the soil in each container; it should be the same, approximately room temperature.
- 6 Leave the containers under the lamp for 20 minutes and measure the temperature every five minutes.
- 7 Move the lamp away from the containers and switch it off.
- 8 Monitor the temperature for another five minutes.
- 9 Draw two graphs showing the temperature changes over time for each container.

### Consider this

Which container had the highest temperature after 20 minutes under the lamp?

Which container's temperature decreased the quickest?



### Tell Me More!

This experiment illustrates the greenhouse effect. The covered container heats up quicker than the uncovered container. Likewise, its temperature decreases more slowly than the uncovered container.

Just like the container covered with cling film, our planet is surrounded by a band of gases called the atmosphere. One of these gases is CO<sub>2</sub>.

Due to the excessive use of fossil fuels, the amount of CO<sub>2</sub> in the atmosphere is increasing every year. The big problem is that, with so much CO<sub>2</sub> surrounding our planet, the right amount of the sun's heat is not escaping back out through the atmosphere. The result is that our climate is becoming too warm, leading to unwelcome environmental changes.

It is important to remember that we do need the greenhouse effect; we need the atmosphere to trap some of the sun's heat so our planet is warm enough for plants and animals to survive.

What would the earth be like if there was no atmosphere to hold in the heat? Like the second container, the earth would cool down quickly and would not hold onto any heat, and what would happen then? Like many things in nature we need a balance. Unfortunately, human behaviour can disrupt this delicate balance.