



e-SMARTkids



EXPERIMENT TIPS

Make a mini greenhouse

The experiment appears in the section *Help the environment*.

Materials

Students will need the materials listed on their activity sheet:

- Two large glass bottles or jars of the same size
- One rubber band
- Optional: two thermometers that will fit inside the bottles
- A pencil
- One piece of plastic wrap (or a recycled plastic bag)
- Four ice cubes, all the same size
- A printout of this experiment

Objective

This experiment will help students understand how the greenhouse effect works. Students will learn that the greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere trap heat energy from the sun. The students should understand that the plastic wrap holds the heat in the bottle just as the clear greenhouse gases trap heat in the Earth's atmosphere.

Getting it across

Have students read the information and follow the steps on the page. Students may assume that the uncovered bottle will let in more sunlight, thus predicting that temperatures will be higher and the ice will melt faster in this bottle. Allow this type of prediction without correcting it, as students will learn otherwise during the course of the experiment.

Questions and answers

Discuss students' predictions and why they were correct or not correct.

1. **Did one bottle of ice melt faster than the other? Why?** (The covered bottle of ice should have melted faster than the uncovered bottle because the plastic traps the heat inside the bottle.)
2. **How are your observations related to the transfer of radiant energy?** (Radiant energy from the sun was transferred to the ice through the plastic.)
3. **How are your observations related to the greenhouse effect?** (The plastic wrap over the top of the bottle is like the layer of greenhouse gases in our atmosphere that are trapping heat from the sun.)

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EXPERIMENT TIPS

Make a mini greenhouse (continued)

Analysis

When fossil fuels are burned to produce energy, gases such as carbon dioxide, methane, and ozone are released into the atmosphere. Without these gases, heat would escape back into space. These gases act like a thin film, or greenhouse, that keeps heat from the sun inside our atmosphere. As human activity has added more greenhouse gases to our atmosphere, the Earth's climate has become gradually warmer, resulting in "global warming." Global warming can cause glaciers to melt, increasing sea levels. It can cause extreme weather, droughts, and floods. It can alter plant and animal habitats, forcing animals to move or die out. Hotter and colder temperatures, and then the need for more energy use, will also affect humans.

So no matter what resources your energy comes from, using energy efficiently at home, at school, and on the road is a very good way to reduce greenhouse gases and help our planet stay healthy.