

Observe the Greenhouse Effect in a Jar

This experiment gets kids exploring how a greenhouse works, and in turn how greenhouse gases affect the Earth's atmosphere. Your child will strengthen observation and recording skills, work with a control, and draw conclusions. And bonus: this is a great outdoor activity!

What You Need:

- Two thermometers
- A notebook
- Pencil or pen
- A clear container, such as a jar
- Watch or clock
- A sunny area, either outside or inside

What You Do:

1. Lay the thermometers in direct sunlight. Let them sit in the sun for three minutes.
2. Open up a page of the notebook and draw two columns, one labeled "Thermometer A" and one labeled "Thermometer B."
3. After the three minutes have passed, read and record the time and thermometer temperatures in the notebook.
4. Place one of the thermometers in the jar or container and seal. Make sure the lid doesn't cast a shadow on either thermometer!
5. Record the temperature of the thermometers every minute for ten minutes.
6. Discuss how the container affected the temperature of thermometers. How did the temperature inside the container change compared to outside the container?



What's Going On? The thermometer outside of the container is constantly being exposed to air that is constantly changing temperature, as the warm air mixes with passing cooler air. The air inside the container is trapped and can't mix with the cooler surrounding air—it just gets warmer as the sunlight heats it up. A greenhouse works in a similar way; solar energy in the form of light creates thermal energy, or heat, that can't escape through the glass.

This activity mirrors how a greenhouse works, but it's not exactly the same as the greenhouse effect that is taking place in the Earth's atmosphere. A complex interaction between light, heat, and chemicals make up the greenhouse effect and the chemicals known as "greenhouse gases" in the environment. They cause the temperature of the Earth to be warmer than it would be without them, much like the glass in a greenhouse, or the jar in this activity.

Did you know?

Some greenhouse gases are actually helpful and natural—they keep the Earth's surface from getting too cold. In fact, without some greenhouse gases, the humans would regularly experience temperatures as low as zero degrees Fahrenheit, or -18 degrees Celsius. The problem comes when pollution caused by human industrialization creates additional greenhouse gases, such as carbon dioxide. Excess greenhouse gases in the atmosphere increase the overall temperature of the earth and disrupt the natural balance of the Earth.

Greenhouse Effect in a Jar adapted with permission from <http://sln.fi.edu/tfi/activity/earth/earth-5.html> (The Franklin Institute Resources for Science Learning).