

What is the Greenhouse Effect?

Purpose: The purpose of this lab is to investigate the nature of and the causes of the Greenhouse Effect.

Materials Needed:

- Two 2-L bottles with the tops cut off
- Two flexible thermometers
- Thin pieces of cardboard
- Soil
- Plastic wrap
- Light bulb in stand

Procedure:

- Pour 1-2 inches of soil in the bottom of each 2-L bottle
- Tape a thermometer to inside of each bottle (be sure the thermometers are at the same height in each bottle)
- Tape a piece of thin cardboard over the bulb of the thermometer to protect it from the light bulb's direct rays
- Cover one bottle with plastic wrap
- Place the light bulb halfway between the two bottles
- Record the internal temperature of each bottle every minute for 15 minutes

Prediction:

Which bottle will experience the greatest increase in temperature over the course of 15 minutes? Explain your reasoning.

Data:

Bottle	Temperature (°C) Each Minute														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Plastic Wrap															
No Plastic Wrap															

Graph:

Graph the temperature vs. time of each bottle on the same graph. Be sure to label each line.

Analysis Questions:

1. Why did the temperature in each bottle raise?
2. Why did the temperatures level off? (Turn off your light and hold your hand behind the bottle.)
3. Why did the temperature of the closed bottle level off at a higher temperature?
4. This process is similar to a car that is closed on a hot day. Does the temperature continue to rise? How do you get the heat out of the car?
5. How did the equipment used in this lab correspond to our planet? What did the bulb, soil, air in the bottles, light bulb and plastic wrap represent?
6. How did the air inside the bottles behave like the Earth's atmosphere?
7. This phenomenon of trapped heat is called the "Greenhouse Effect" because greenhouses use this method to grow plants indoors. What are the pros and cons of this effect?