

## PRELIMINARY ACTIVITY FOR Global Warming

Global warming is an environmental science topic of much concern. The average surface temperature the Earth increased by  $0.6^{\circ}\text{C}$  during the 20<sup>th</sup> century, with the increase occurring mainly from 1910 to 1945 and 1976 to 2000. The 1990s was the warmest decade, and 1998 was the warmest year of the century and on record. Growing scientific consensus attributes this global warming to the enhanced greenhouse effect. In this experiment you and your classmates will investigate the greenhouse effect and the enhanced greenhouse effect.

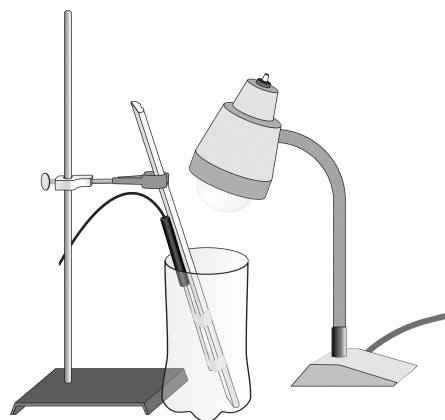
In the Preliminary Activity, you will gain experience using a Temperature Probe and learn technique that can be used in your subsequent research.

After completing the Preliminary Activity, you will first use reference sources to find out more about global warming, the greenhouse effect, and the enhanced greenhouse effect before you choose and investigate a researchable question. Some topics to consider in your reference search are:

- global warming
- greenhouse effect
- enhanced greenhouse effect
- greenhouse gases
- infrared radiation
- anthropogenic effect

### PROCEDURE

1. Connect the Temperature Probe to the interface.
2. Open the data-collection program and set up the program to collect data for 15 minutes.
3. Tape the Temperature Probe to a ruler as shown in Figure 1. The probe tip should be 5 cm from the ruler end, and the tape should not cover the probe tip.
4. Obtain a cutoff bottle and prepare it for data collection
  - a. Place the Temperature Probe in the cutoff bottle as shown in Figure 1.
  - b. Position a lamp centered above the cutoff bottle. The bulb should be about 5 cm above the cutoff bottle. The ruler should shield the Temperature Probe from direct light emitted by the lamp.
5. Start data collection, and then turn on the lamp.
6. When data collection is complete, turn off the lamp.
7. Use the Statistics function to determine the initial (minimum) and final (maximum) temperatures. Record these values.



**Figure 1**

## **QUESTIONS**

1. What was the initial temperature in the Preliminary Activity? What was the final temperature?
2. Calculate the temperature change.
3. List five greenhouse gases.
4. List at least one researchable question for this experiment.