

Definitions:

- A **gas** is a fluid that has neither shape nor volume. Under no pressure, a gas will expand indefinitely. An example of a gas is air.
- **Radiation** is the transmission of energy in the form of waves or particles. Radiation, along with conduction and convection, is one of the three ways that heat can be transferred.

Background:

The chemical bonds in carbon dioxide molecules absorb solar energy, trapping heat within the atmosphere in the same way glass traps heat within a greenhouse. Because of this heat-trapping ability, gases such as carbon dioxide, methane, and nitrous oxide are known as greenhouse gases. The warming of the atmosphere that results from greenhouse gases is known as the greenhouse effect. Human activities are greatly increasing the concentrations of greenhouse gases in the atmosphere. The average global temperature is directly correlated with the increasing concentration of these gases in the atmosphere.

Equipment:

- Basic Stamp microcontroller with two temperature sensors, connected to a laptop with PBasic software
- A lamp
- Glass jar
- Ring stand

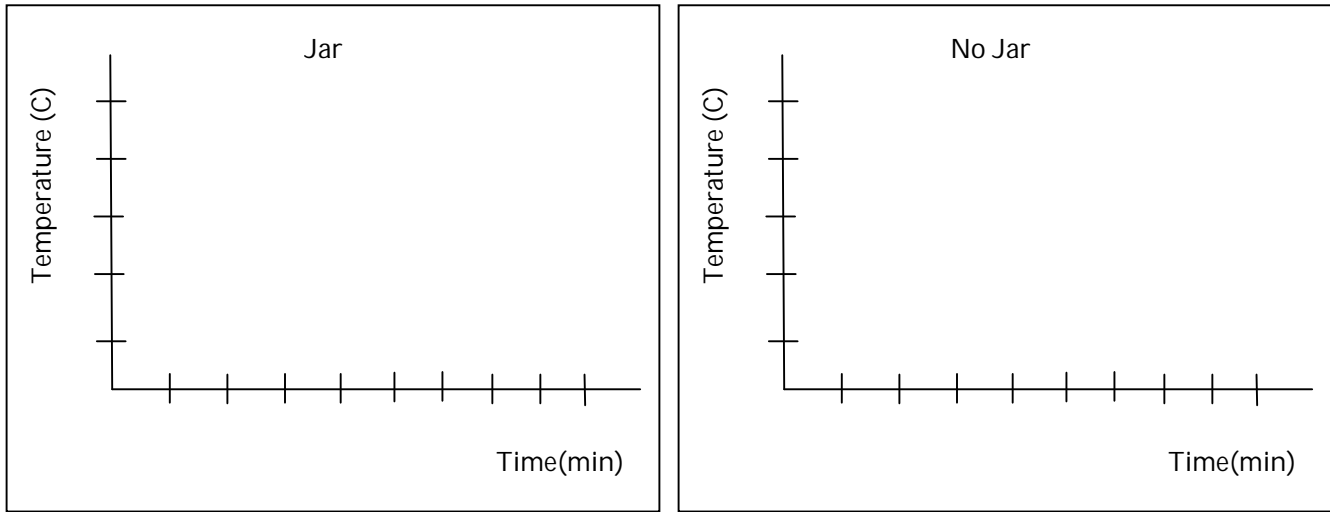
Procedure:

Place one temperature sensor in the jar, and the other suspended at the same height from a ring stand. Arrange equipment so that each probe is approximately 1 foot away from the lamp. Turn on lamp, and then begin recording the temperature for six minutes on the table below.

Time (minutes)	1	2	3	4	5	6
Temperature of probe in jar (°C)						
Temperature of probe out of jar (°C)						

Analysis:

Plot your results on the two graphs below.



Questions:

1. Which thermometer indicates the higher temperature at each time? Why?
2. How is the jar behaving like the Earth's atmosphere?
3. What is an example of a gas in the atmosphere that acts like the glass jar?
4. What is this process called and why?
5. What would the Earth's climate be like if we did not have the greenhouse effect?