

## Hot Gas, Hot Air! (Part 2)

**Time:** Approximately one class session.

**Standards:**

Earth science - ninth grade 4.c

**Topical Objectives:**

Show the difference effects of temperature regulation between water and air in the presence of greenhouse gasses.

**Safety Rules:**

Dry ice (for teachers)  
Infrared lights are hot!

**Materials:**

- Containers with lids for gas collection (containers need to be large enough when laying on it's side to cover the ice containers)
- Infrared lights or sun
- Dry ice
- Large plastic cup (16 oz)
- Thermometer
- Stop watch
- Ring stands

**Preparation:**

Students should know about greenhouse gas types and the capacity or air versus water.

Put some dry ice in a screw top container - do not cap! After dry ice is gone, cap container (this way only CO<sub>2</sub> is in container).

**Procedure:**

1. Set up 2 ring stands.
2. Place a cup with water (known amount if higher level so calories can be measured) on the table under the ring stand.
3. Place a cup with air on the table under the other ring stand.
4. Place container of CO<sub>2</sub> on top of the cups
5. Place each heat source above each gas container (Make sure the heat is equal distant from each container).
6. Turn on heat sources.
7. Record the temperature at 1 minute intervals.
8. Graph your data.
9. Analyze your findings.

**Extensions:**

Use different gasses; water vapor, methane (from a bio-gas generator)

Use colored Ice (black)

**Synthesis:**

Feeding off a prior unit involving the generation of greenhouse gasses, show how those gasses affect the transfer of heat to earth.

Sources: Sandy Hively