Cosmic Chemistry: Planetary Diversity

Hot and Cold Running Planets

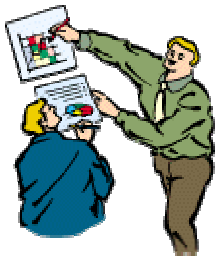
STUDENT ACTIVITY

1. The discussion leaders should begin this activity by finding some reasonably current articles in newspapers, reference books, news magazines, or scientific publications that deal with the greenhouse effect. This group should then prepare and deliver an oral report to the class that deals primarily with the following questions:
   a) What causes the greenhouse effect?
   b) How might increasing the greenhouse effect impact life on Earth?
   c) Has Earth had a greenhouse effect for many millennia or is this a new phenomenon?
   d) What would life on Earth be like without the greenhouse effect?
   e) What other rocky planet has a very large greenhouse effect and what causes it?

2. Following the presentation by the discussion leaders, as a construction team, you should:
   - Decide on an experimental setup.
   - Collect the necessary materials.
   - Assemble the apparatus for simulating the greenhouse effect.

   You might want to consider using two containers such as one-liter beakers, each equipped with a thermometer, and shining the light simultaneously, but evenly, on both containers (from above to simulate sunlight). Or, you might use only one container such as a small aquarium. In either case, direct the data-recording group to make two sets of measurements—one with the container open and one with it covered with a glass plate or plastic wrap. Make sure that your design includes a way to shade the thermometer to prevent the heat lamp from radiating direct heat.

3. The data collection group should now use the apparatus assembled by the construction team to collect data that simulates the greenhouse effect. After the data have been collected, a graph showing time on the x-axis and temperature on the y-axis should be created for both the open and the closed container. These graphs should then be posted in the designated location in the room.



4. The discussion leaders or your instructor will now lead the class in a follow-up discussion of the experiment.