

Global Warming Experiment

Question: How does the earth maintain a temperature range that can support life? What provides heat to the earth? What keeps the earth from getting too hot?

Materials:

One large clear glass jar (large enough to hold a plastic or paper cup)

Two paper cups

Soil (such as potting or topsoil)

Outdoor thermometer (small enough for the base to fit in the cup)

Spray bottle with water.

Procedure:

1. Place the soil in each of the cups so the cups are almost full. Label one cup "A" and the other cup "B".
2. Place the thermometer in cup "B" so that the base (the bulb of the thermometer) is slightly buried by the soil.
3. Place both cups in direct sunlight (such as on a table outside). Wait about 10 minutes and record the temperature in cup "B".
4. Move the thermometer to cup "A" and repeat the temperature measurement. Both cups of soil should be at the same temperature, if not, wait a few more minutes before taking the temperature.
5. Place the large glass jar (upside down) over cup "A" keeping the thermometer in the soil.
6. Wait several minutes and remove the jar and record the temperature.
7. Move thermometer to cup "B" that was not covered, wait several minutes, and record the temperature again.

Observe:

What did the temperature do when the soil was covered by the glass jar?

Temperature Observations:

Cup A:

At the Beginning: _____

After Covered by Glass Jar: _____

Cup B:

At the Beginning: _____

At the End: _____

Evaluate:

Why do you think the temperature changed when the earth (soil) was enclosed by the glass jar? What is the source of the heat? Why did it not affect cup "B" that wasn't covered?

Enrichment:

Repeat the entire experiment with one addition. After you have recorded the temperature in the soil covered by the jar, spray water mist into the jar before turning it over and

covering the cup. Wait and record the temperature again. What happens? Is the temperature higher or lower when the water mist is sprayed in the "atmosphere" of the earth (the cup). Why do you think the water mist makes a difference?

Extension:

Water vapor is invisible. Can you think of other gases in the earth's atmosphere that can have the same effect that water vapor did in this experiment? Why did you use two cups instead of only one? What happened to the temperature of cup "B" that was not covered by the jar? Most experiments have what you might think is an "extra" object or subject that is studied or measured. Why do you think this is important and what do you think it might be called?

Personal Experience:

Have you ever walked into a greenhouse? What was it like? Can you think of other situations where the heat from sunlight is trapped in a small space and it gets hot? Why might this greenhouse effect be bad for the earth?

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