



Measuring Heat Flow Through Different Types Of Materials

QUESTION

How well do various materials insulate (reduce heat flow)?

HYPOTHESIS

In your science notebook, make a prediction about which type of container will best keep water at its original temperature. (If possible, use an "If...then...because..." format.)

MATERIALS

- Cups of various composition—styrofoam, paper, glass, plastic, metal, or any other
- A lid with access for a thermometer provided for each container.
- Water of a given temperature (hot or cold. Hot water should not exceed 70°C).
- 100 mL graduated cylinder
- Thermometer or Temperature Probe—one for each cup
- Clock or timer
- Science notebook

PROCEDURE

1. Construct (or purchase) a lid for each container to allow a thermometer to pass through the lid and into the cup. Some recommendations for lid materials are aluminum foil, saran wrap, note book paper. Remember all lids need to be the same.
2. Prepare enough water (either hot or cold) to place 100 mL of water into each container.
3. Take and record the room temperature.
4. For each cup, carefully measure 100 mL of water and put it into the container, placing the lid and thermometer in place to begin taking temperature measurements. Take a reading for the beginning temperature of each container. Take a temperature reading of each container at 3-minute intervals for a total of 30 minutes or until the temperature of the water is within 5 degrees of room temperature. Record the results in the data table.
5. Take and record the room temperature.

DATA

Use the data table on the following page to record your results

CONCLUSION

1. Do you accept or reject your hypothesis? What were the results of your investigation? Use data to explain what happened. Why do you think this happened?
2. How does this demonstration relate to climate change?



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DATA TABLE

Beginning room temperature: _____					
	Cup #1	Cup #2	Cup #3	Cup #4	Cup #5
Type of material in cup					
Initial water temperature:					
3 Min:					
6 Min:					
9 Min:					
12 Min:					
15 Min:					
18 Min:					
21 Min:					
24 Min:					
27 Min:					
30 Min:					

Create a graph in your science notebook displaying temperature vs time for each container. Using different colors on the same graph will allow for easy comparison of the various containers.