

INSTRUCTIONS FOR CONDUCTING AN INSULATION EXPERIMENT

1 Begin preparing each cup. It's best to prepare the cups before filling them with hot water so that your starting temperatures will be as close as possible. Wrap the first cup in a double thickness of aluminum foil, making sure that you keep both the sides and bottom covered. Hold the foil in place with rubber bands

2 Repeat with three other cups, using only a single layer of each material. You should have one cup covered with aluminum foil, one covered in cotton batting, one covered in craft foam, and one covered in bubble wrap, all secured with rubber bands. The fifth should stay uninsulated.

3 Make a hypothesis about which insulation material will best keep a hot cup of water warm. Which material did you choose? _____

4 Add 1 cup of hot water to each cup, then place a thermometer to each cup. If you don't have extra thermometers, you can also do one cup at a time, but it will take a lot longer.

5 Cover each cup with plastic wrap, making sure you can still read the thermometer without moving the plastic wrap.

6 Record the starting temperature for each cup.

Aluminum foil: _____
Cotton batting: _____
Craft foam: _____
Bubble wrap: _____
No insulation: _____

7 Leave the cups alone for ten minutes and then record the new temperatures.

Aluminum foil: _____
Cotton batting: _____
Craft foam: _____
Bubble wrap: _____
No insulation: _____

8 Wait ten more minutes, and then record the last temperature reading.

Aluminum foil: _____
Cotton batting: _____
Craft foam: _____
Bubble wrap: _____
No insulation: _____

9 What's the difference between the starting temperature and the ending temperature for each cup?

Aluminum foil: _____
Cotton batting: _____
Craft foam: _____
Bubble wrap: _____
No insulation: _____

10 Which one had the smallest difference?

Was your hypothesis right?

TAKING IT A STEP FURTHER (OPTIONAL)

11 What other materials could be used as insulation?

12 Replace the hot water with ice water. Does this change your hypothesis? If so, which insulation is best for keeping ice water cold? If you have the time, repeat the experiment with ice water.
