



TESTING WHICH NATURAL MATERIALS MAKE THE BEST INSULATION

Insulation slows down the transfer of heat. In this experiment, you will test which natural material is best at keeping heat from escaping.

QUESTION

Which natural material is the best insulator?

HYPOTHESIS

I think _____
will be the best insulator because _____.

MATERIALS

- 4 identical jars, cups, or thermos containers
- 4 thermometers (kitchen or classroom type)
- Hot water (about 150–160°F / 65–70°C)
- Natural materials to test (choose 3–4):
 - Dry leaves
 - Straw or hay
 - Pine needles
 - Wood shavings
 - Cotton (unbleached)
 - Wool
 - Shredded bark or mulch
- Rubber bands or tape
- Timer or clock
- Notebook and pencil



METHOD

1. Label your jars: Control (no insulation), and one for each natural material you are testing.
2. Wrap each jar (except the control) with a 2–3 cm (1 in) thick layer of the natural material. Secure it with rubber bands or tape. Leave the top uncovered.
3. Pour the same amount of hot water into each jar.
4. Place a thermometer in each jar so the bulb is in the water but not touching the bottom.
5. Record the starting temperature of each jar.
6. Let the jars sit undisturbed.
7. Record the temperature in each jar every 5 minutes for 30 minutes.
8. Compare how much the temperature dropped in each jar. The jar with the smallest temperature drop has the best insulation.



TIP: Keep all other variables the same—same jar type, same amount of water, same starting temperature, same room.

DATA TABLE

Time (minutes)	Control (no insulation)	Temperature (°F or °C)			
		Material 1	Material 2	Material 3	Material 4
0 (start)					
5					
10					
15					
20					
25					
30					

Which material kept the water warmest (smallest temperature drop)? _____



Think about it: How do animals or plants use insulation in nature? How might people use these materials in houses or clothing?

Name: _____

Date: _____

Age/Grade: _____

OBSERVATIONS

What did you notice during the experiment?

CONCLUSION

Which natural material was the best insulator?

Why do you think it worked best?

What could you test next?
