

Science Experiment: The Cozy Den Contest

The Question

Which material—dried leaves, pine needles, or shredded paper—is the best insulator for a hibernating animal's den?

Research (What we know)

Hibernating animals, like bears or groundhogs, find or dig dens. They line these dens with materials from the forest to trap their body heat so they don't freeze while they sleep.

Hypothesis (The "I Think" Statement)

Have each student or group fill in the blank:

"If we use _____ to line the den, then the animal will stay the warmest because _____."

The Experiment (The Test)

Materials Needed:

- 3 small plastic water bottles (the "Animals")
- 3 shoeboxes (the "Dens")
- Variables: Dried leaves, pine needles, and shredded paper
- A thermometer for each box
- Warm tap water (not boiling)

Procedure:

1. Prepare the Dens: Fill Shoebox A with leaves, Shoebox B with pine needles, and Shoebox C with shredded paper.
2. Prepare the Animals: Fill all three water bottles with warm water of the exact same temperature.
3. The Hibernation: Bury one "animal" inside each material in its shoebox den. Place a thermometer next to the bottle inside the material.
4. The Winter Chill: Place all three boxes in a cold area (a refrigerator or outside if it's winter) for 30 minutes.
5. Data Collection: After 30 minutes, remove the bottles and record the temperature of the water inside each one.

Den Material	Start Temp:	End Temp:	Temp Change
Leaves			
Pine Needles			
Shredded Paper			

Conclusion

Was your hypothesis correct? Based on the data, which material was the best insulator? _____

Scientific Method Vocabulary

Insulator: A material that slows down the movement of heat.

Variable: The one thing you change in an experiment (in this case, the bedding material).

Constant: The things that stay the same (the size of the box, the amount of water, the time in the cold).