

Animals in Winter Science Activities

1. The "Blubber Glove" Experiment (Adaptation)

The Goal: To understand how marine mammals (like whales and seals) stay warm in freezing arctic waters.

Materials: Two large Ziploc bags, a tub of ice water, and a large container of shortening (like Crisco).

The Process:

1. Fill one Ziploc bag with shortening.
2. Place the second (empty) bag inside the first one and fold the edges over so the shortening is trapped between the two layers. This is the "Blubber Glove."
3. Have the student put one bare hand in the ice water and the other hand inside the "Blubber Glove" before dipping it into the ice water.

The Science: Students will feel that the "blubber" hand stays warm. Shortening, like animal fat, is an insulator that prevents body heat from escaping into the cold water.

2. The Heart Rate Challenge (Hibernation)

The Goal: To visualize how much energy animals save when their heart rate drops during a "deep sleep."

Materials: A stopwatch and a jump rope.

The Process:

Active State: Have students jump rope or run in place for one minute. Immediately have them count their pulse for 15 seconds. (Multiply by 4 to get the "Active Heart Rate").

Hibernation State: Have students lie perfectly still on the floor, eyes closed, breathing very slowly for two minutes. Count their pulse again for 15 seconds.

The Science: Compare the two numbers. Explain that while a student's heart rate might drop a little, a groundhog's heart rate drops from 80 beats per minute to just 5. This illustrates how hibernation allows an animal to "stretch" its fat stores all winter.

3. The "Subnivean Zone" Model (Physical Adaptation)

The Goal: To see how snow acts as an insulator for small rodents like voles.

Materials: A plastic bin, a thermometer, a desk lamp (to act as the "sun"), and "snow" (cotton batting or real snow if available).

The Process:

- Place one thermometer on the "ground" (the bottom of the bin) and cover it with a thick layer of cotton batting or snow.
- Place a second thermometer on top of the "snow."
- Turn on the desk lamp or leave the bin in a cold area. After 20 minutes, check the temperatures.

The Science: Students will see that the thermometer under the snow stayed warmer. This demonstrates why small animals spend their winter in the subnivean zone rather than on the surface.

4. The Magnetic Compass Challenge (Migration)

The Goal: To simulate how birds and whales use the Earth's magnetic field to find their way south without a map.

Materials: A sewing needle, a small magnet, a bowl of water, and a small piece of cork or a leaf.

The Process:

1. Rub the magnet against the needle about 50 times (in one direction only) to "magnetize" it.
2. Place the needle on top of the cork and float it in the center of the bowl of water.
3. Watch as the needle slowly turns to point North/South.

The Science: Explain that many migratory animals have tiny bits of a mineral called magnetite in their brains. This acts just like the needle, helping them feel the Earth's magnetic "pull" so they never get lost on their 10,000-mile journeys.

5. The "Hide and Seek" Camouflage Game (Adaptation)

The Goal: To demonstrate why the snowshoe hare's color change is vital for avoiding predators.

Materials: A large sheet of white butcher paper and 20 small squares of paper (10 white, 10 brown).

The Process:

1. Spread the white paper (the "snow") on the floor.
2. Scatter all 20 squares across the "snow."
3. Give a student (the "Lynx") 5 seconds to "hunt" as many squares as possible.

The Science: Most students will pick up the brown squares first because they stand out. This shows the power of camouflage—the white squares (winter hares) were much safer because they blended into their environment.

6. The Bird Feeder "Energy Lab" (Survival)

The Goal: To understand why high-fat food is essential for birds that don't migrate.

Materials: Two different types of birdseed (one mostly "filler" like cracked corn, and one high-fat like black oil sunflower seeds or suet).

The Process:

- Set up two simple feeders within sight of the classroom window.
- Have students tally how many birds visit each feeder over a 15-minute period for three days.
- Observe which seeds disappear faster.

The Science: Birds that stay north (like Chickadees) need high-calorie, high-fat food to keep their body temperatures up. Students will see that birds "know" which food provides the most thermal energy to survive a freezing night.