

Animal Adaptations to the Cold

Wintertime Science

Snowy conditions are always a little bit foreign to our Southern California students, but the associated science concepts are very relevant. Try bringing a bit of the cold weather into the classroom with this lesson on animal adaptations.

Ask the students how many of them have seen real snow. What type of clothes do they need to wear when it is snowy? (Answers: jackets, warm hats, mittens/gloves; warm socks, protective shoes, warm scarves, etc.) What animals live in cold, snowy areas? (Answers will vary.) What protection do animals have from the cold? (Answers: They seek shelter; they hibernate; they have thick fur; they have blubber; they have warm feathers, etc.)

Explain how the students can make some insulated mitts to protect their hands from the cold. Once the insulated mitts are ready, the students can test them by putting on a mitt and plunging their mitt-covered hand into an icy bath. Have the students follow these directions:

1. Take a material, such as shortening, cotton balls, bubble wrap, foil, or feathers and place the material into a quart-size Ziploc bag. If the material is shortening, place it in a blob at the bottom of the bag. For the other materials, position them so they are covering the inside surface of the bag.
2. Place a second quart-size bag into the first bag so that it is inserted into the center of the insulating material.
3. Use duct tape to secure the top of the inside bag to the top of the outside bag.
4. For the mitt with shortening, have the students spread around the shortening (which represents blubber), so it is evenly spread as an insulating layer between the two bags.
5. Once ready, place the mitt on your hand and immerse it into a basin of icy water.
6. Conclude the lesson by discussing the result of the experiment. Which materials were the best insulators? (Shortening and bubble wrap) Which were the poorest insulators? (Foil) Also, compare the materials to animal materials:
 - a. Polar bear hairs are hollow so that the air-filled hair shaft work as an insulator, like the bubble wrap.
 - b. Sea otters can trap air bubbles between the hairs of their extremely dense fur; this also acts like the bubble wrap.
 - c. Many mammals, including aquatic mammals, such as whales and seals, have a thick layer of blubber to keep them warm in icy conditions.
 - d. Birds have an insulating layer of warm downy feathers.