LOUISIANA STATE UNIVERSITY

NATURE'S INSULATION

Materials

For each group of 3-4:

Part I

- small jars
- warm water
- thermometer
- rubber bands
- different insulating materials (e.g. cotton, wool, polyester, fur, nylon)

Part II

- four large, re-sealable ("ziploc") clear plastic bags
- one pound of solid vegetable shortening (such as Crisco)
- masking or duct tape
- bucket of cold water with ice cubes
- watch with a second hand or stop watch
- weights (such as stones)

National Standards

A: Science as Inquiry

H: Life Science

Students will explore how insulation plays a large part in keeping animals warm.

Part I: Insulation

Procedure

1. Open discussion with students as to how they stay warm in the winter.
2. Place warm water into small jars and record the temperature of the water in each jar.
3. Quickly, have the students wrap the jars in the available insulating materials and put a rubber band around the jar to keep the material in place.
4. After 15 minutes, unwrap the jars and take the temperature of the water.
5. Record the results.

Part II: Blubber Glove

(taken from http://www.proteacher.com/090069.shtml)

Procedure

1. Each work team of 2-4 students will need 4 bags and 2-3 cups of solid shortening. Have students take turns covering one hand with a plastic storage bag. Put a generous amount of solid shortening into another bag. Have the student put the plastic-covered hand into the bag with the shortening. Knead the shortening to make sure the hand is completely surrounded by shortening.
2. Wrap masking tape around the portion of the bag covering your wrist to seal the bag. (optional).
3. Cover the other hand with 2 bags without shortening. This is the "control."
4. Place both hands simultaneously into a bucket of ice water. Team members time and record how long each hand remains underwater until the sensation of cold is noted. Whales, Weddell seals, and penguins all have blubber. How is solid shortening like the blubber that these Antarctic animals have? What other advantages does blubber give marine animals besides warmth? (buoyancy, food source, and heat exchange)
5. Remove the bags from the students' hands and seal the inner bags so water won't get in. Drop weights into the outer bag of each double "glove" and put the bags gently back into the bucket of water. How much weight can each bag hold before it sinks to the bottom of the bucket?