

Animal Insulation

Preview



Photo by Opher Ganel, University of Maryland and National Science Foundation

Whales, Weddell seals, and penguins swim in the icy waters of Antarctica. These animals all have thick layers of fat, called **blubber**, under their skin. Some also have fur or feathers on the outside. This activity will give you a first-hand feel for how blubber and fur insulate animals from the cold.

Prepare

Part 1 - Blubber

1. Spoon about two cups of blubber (shortening) into one of the plastic zipper lock bags.
2. Turn a second bag inside out and put it into the first. Push it in and turn it so the zipper halves of the inner bag line up with the zipper halves of the outer bag.
3. Squeeze out any extra air between the bags, then zip them together.
4. Knead the shortening around between the two bags to make an even layer of blubber between the walls of the bags.
5. To prevent leaks, wrap a piece of duct tape around the opening and fold it inward to seal the two bags together.
6. Prepare a second pair of plastic bags as your "control" glove. Leave them empty so you'll be able to compare the blubber glove to one with no insulation.



Time

⌚ 30 minutes

Tools & Materials

- Large, waterproof container: bowl, plastic bin, bucket, aquarium, etc.
- 1-quart plastic zipper lock bags (10) - *see note below.
- Duct tape
- Washcloth or other cloth of similar size
- Other insulating materials (cotton balls & fiberfill)
- Colored markers
- + 2 cups solid vegetable shortening or lard
- + Medium size cooler of ice
- + Water
- + Large sheet of poster board or construction paper
- + Towels for cleanup
- + Optional: Additional insulating materials (feathers, down, etc.)

📖 Items found in this book

- Items included in the Flexhibit Kit, available from <http://www.andrill.org/flexhibit>.
- + Additional items

* Plastic Bag Tip

Heavy-duty freezer bags work best, but don't use the kind with plastic sliders. Use the kind that seal by pressing the two strips together.



The finished blubber glove.

7. Fill a large container with ice cubes. Add water until the water level is about halfway up the sides of the container.
8. Put one hand into the blubber glove and the other into the control glove.
9. Place both gloved hands into the icy water at the same time and compare how they feel.
10. **IMPORTANT!** Remove the gloves from the ice water and let them return to room temperature before the next person uses them!



Comparing the blubber glove and the control glove.

Part 2 - Insulated Clothing

It's not practical — or healthy — for us to put on a thick layer of blubber to protect us from the cold, so we need to do something different to stay warm. People visiting or living in areas with cold climates wear thick layers of insulated clothing. The air spaces trapped within the clothing keep our warmth inside and the cold outside.

1. Fold the washcloth or piece of cloth in half and in half again.
2. Turn one plastic bag inside out on your hand and place it within the fold of the washcloth.
3. Insert the cloth and plastic bag into a second plastic bag and seal the openings using the plastic seal and duct tape.
4. Test this glove in the ice water bath — compare it to the control glove and to the blubber glove.
5. Can you think of a way to improve the insulation level of the cloth glove? What other materials might you test? If you have time and materials, make additional gloves containing other insulating material.

Ponder. . .

Some researchers in Antarctica SCUBA dive under sea ice to observe animals or gather specimens. In order to survive in the water, humans wear insulated dry suits that trap heat in and keep water out. Once they are out of the water, they need to remove their suits, to avoid overheating.



Photo by Henry Kaiser, National Science Foundation

Since animals can't take off their blubber, what can they do to keep from overheating? Describe your ideas about how Antarctic animals might cool off.

Would YOU go SCUBA diving under Antarctica's ice? Describe what it would take to get you to go into the water.

Practice

Acknowledgment

This activity was adapted from "Blubber Glove," originally produced by the Gulf of Maine Aquarium.

Got the Big Idea?

Blubber and fur insulate animals from the cold in Antarctica. Humans bring insulated coats with them to keep warm.

Get ready to present

Come up with a question or statement to invite visitors to test your gloves to feel for themselves one way that animals stay warm in Antarctica. Prepare one or more sets of blubber gloves, control gloves, and gloves with other insulating materials. Store your blubber glove in a refrigerator. Get it out of the refrigerator a day ahead of time so that it can warm up to room temperature before your Flexhibit.

Special preparations for this station

You'll need to have a supply of extra ice available to add to the container of ice water as it melts.

Present

Set up your container of ice water and place your gloves in front of it. Invite visitors to put their hands in the gloves and then into the ice water. Be ready to explain what the gloves represent and demonstrate how to do the test.

After a visitor tests the gloves, remove them from the ice water right away. Let the blubber warm up to room temperature between trials—if it remains in the container too long, it will be as cold as the ice water.

As the ice begins melting, add additional ice to the container. Use a cup to take some of the melted water out whenever you add extra ice. Keep the water level in the container low enough that water won't leak into the top of the gloves as visitors test them. Keep a towel handy and use it to wipe up drips and spills.