



Hands – On Science with NOAA

TITLE: How Marine Mammals Stay Warm

OVERVIEW: Wearing a “lard glove”, participants plunge their hands into an ice water bath to investigate the insulative properties of blubber.

MATERIALS: 3 gallon or quart size Ziplock bags, 1 large container of lard or shortening, two large containers of ice or ice water.

INSTRUCTIONS:

1. Scoop fat into two of the Ziplock bags (spread the fat out inside the bag so that it fills the bag and is about 1 inch thick). Seal the bags.
2. Lay one bag on top of the other and tape three of the sides together making a “mitten”.
3. Slide the mitten into the third bag with the open side of the mitten facing out of the third bag.
4. Put the mitten into one of the containers of ice, or ice water.
5. Put one hand into the mitten and put your bare hand into the second container of ice. (Using a heavy rubber “kitchen glove” can also be used for the bare hand. If a lot of people are doing the activity this will help keep the demonstration area dry.)

SCIENCE EXPLANATION:

Blubber is important for most marine mammals, such as whales and seals. The thick layer of fat provides insulation from cold ocean temperatures. But blubber is also important because it stores energy that can be broken down to provide the animal energy when food is unavailable. Weddell seals live in Antarctica and can have more than 2 inches of blubber. Considering their massive weight of 400-600 kg (800-1320 lbs), that could be up to 240 kg (528 lbs) of pure blubber. Bowhead whales live in Arctic waters and can have 43-50 cm (17-19 inches) of blubber, thicker than any other whale's blubber layer.

EXTENSION IDEAS

- Use a thermometer to measure the temperatures over time, with and without the mitten, and graph the results.
- Predict results and test mittens with different thicknesses of fat.
- Predict results and test mittens with different materials for insulators.
- Investigate the thickness of different marine mammals blubber and make models showing the actual thicknesses.

REAL WORLD:

Weddell Seal Blubber:

<http://www.polartrec.com/expeditions/weddell-seals-in-the-ross-sea/journals/2012-02-19-0>

Marine Mammals

<http://www.afsc.noaa.gov/nmml/education/marinemammals.php>

Whales For Kids

<http://www.nmfs.noaa.gov/pr/education/whales.htm>



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