



# Polar Bear Blubber

## **Audience**

Activity designed for ages 12 years and up.

## **Goal**

Students will understand the importance of blubber in cold climate animals.

## **Objective**

- To use critical thinking skills to hypothesize how different materials can help keep us warm in cold water.

## **Conservation Message**

Asia is the largest and most populated continent. It is in the Eastern and Northern Hemispheres and covers 9% of the Earth's total surface area. Asia has extremely diverse climates, geographic features, animals, and plants. Unfortunately, the unique biodiversity of Asia is under threat because of habitat loss and overexploitation of species. You can help mitigate these threats by supporting local zoos and aquariums that participate in species survival plans and other conservation efforts.

## **Background Information**

When we think about Polar bears, we normally think of Alaska and Canada. The Polar bear population is found throughout the Arctic Circle, which includes the northern part of Russia. The Russian population is estimated to be around 3200 bears, the North American population is only around 2000 bears. They are considered a marine mammal because of the amount of time they spend in the water. Sea ice is a very critical component to their hunting style. Since these bears spend so much time in the icy waters, they need a way to stay warm. Water takes away heat 25 times faster than air. They have an extra fat layer known as blubber. Blubber is great for thermoregulation; this means fat keeps heat in and cold out. Fats work great as insulators because of their high density and low thermal conductivity relative to water. Despite being surrounded by incredibly cold water, fats can maintain a constant temperature. Blubber requires very little blood supply, allowing more blood to be circulated to skin surfaces that are more directly exposed to the cold temperatures.

## Materials Needed

- Observations Worksheet (provided)
- Wool or Cotton Winter Glove
- 1 cup Crisco or Butter (softened)
- Bubble Wrap
- Rubber Band
- 1 Sandwich Baggie
- Scissors
- Ice
- Bowl
- Timer or Stopwatch
- Pen/pencil

## Length of Activity

30 minutes

## Procedure

### Prep for Trials

- Fill bowl with ice water.
- Gather 1 wool/cotton glove for Trial #2.
- Place Crisco or softened butter into baggie for Trial #3.
- Cut a strip of bubble wrap long enough to wrap around 1 or 2 fingers, for Trial #4

*You can start with any trial you would like. Be sure and allow a few minutes for fingers to come back to a normal temperature before starting the next trial.*

### Experiment

- For each trial, you will be placing your fingers into the ice water and determine which trial will keep your fingers warmer. Start by writing your hypothesis on the Observations worksheet.
- Put on the wool/cotton glove. Set timer for 20 seconds. Place 1 or 2 fingers into the ice water. Start timer. Write on the observations worksheet how cold the water felt on scale of 1-10 with 10 being the coldest and write down how your fingers felt during the trial.
- Put one or two fingers into baggie with Crisco/butter. Set timer for 20 seconds. Submerge baggie into ice water, but do not submerge to where water overflows the bowl or into the baggie. Start timer. Write on the observations worksheet how cold the water felt on scale of 1-10 with 10 being the coldest and write down how your fingers felt during the trial.
- Wrap the bubble wrap around 1 or 2 fingers, secure with a rubber band. Set timer for 20 seconds. Place bubble wrap covered fingers into ice water. Start timer. Write on the observations worksheet how cold the water felt on scale of 1-

10 with 10 being the coldest and write down how your fingers felt during the trial.

- Set timer for 20 seconds. Place 1 or 2 bare fingers in the ice water. Start timer. Write on the observations worksheet how cold the water felt on scale of 1-10 with 10 being the coldest and write down how your fingers felt during the trial.

*If your fingers feel too cold during the 20 seconds be sure and take them out, do not wait for the timer to go off!*

# Observations

Hypothesis: Which trial will keep your fingers from feeling the cold icy water?

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## Observations and Time

<p>Trial #1 Bare fingers</p>	<p>Water Coldness Scale (1-10):</p> <p>Describe how the water felt on your fingers:</p>
<p>Trial #2 Wool/Cotton Glove</p>	<p>Water Coldness Scale (1-10):</p> <p>Describe how the water felt on your fingers:</p>
<p>Trial #3 Crisco/Butter</p>	<p>Water Coldness Scale (1-10):</p> <p>Describe how the water felt on your fingers:</p>
<p>Trial #4 Bubble Wrap</p>	<p>Water Coldness Scale (1-10):</p> <p>Describe how the water felt on your fingers:</p>

Was my hypothesis correct? (Circle one)

Yes

No