



## OCEAN EXPLORATION

### Concepts

Blubber is a layer of fat that helps whales stay warm in cold waters.

During the winter

Humpback whales feed and store enough energy in their blubber so that they don't even have to eat after they migrate from Alaska to Hawaii.

### HCPS III Benchmarks

SC 6.1.1

SC 6.1.2

### Duration

1 hour

### Source Material

PRISM

### Vocabulary

Blubber

Thermometer

Fahrenheit

Celsius

## Big on Blubber: How do whales stay warm?

### Summary

Why would a whale need six inches of fat? In this activity students will explore the importance of blubber and determine how whales use blubber to stay warm. They will design an experiment with “blubber” to test the benefits of having a layer of fat to keep warm as the whales migrate and live in the cold waters off Alaska.

### Objectives

- Students will be able to identify the biological benefits of having blubber
- Students will be able to conduct an experiment and collect data
- Students will properly measure and monitor water temperature
- Students will describe energy use and storage in whales

### Materials (one per group)

Thermometer

Timer

Crisco

Ice

Ziplock bags

Bucket or large Tupperware

### Making Connections

The temperature in Hawaii is pretty comfortable year round. But some days (in the winter months or during a storm) it is cold, what do you do to stay warm on cold days? Humpback whales can tolerate both cold and warm water temperatures. The water is much warmer in Hawaii than it is in Alaska. How do you think they stay warm in the cold water of Alaska? This lesson is the third of the whale research notebook that involves another experiment that investigates why whales have to eat so much and how they store their energy.

### Teacher Prep for Activity

1. Buy some bags of ice and put them away in the freezer
2. Buy Crisco, take it out of the package and put it into a gallon Ziplock container (this is your “blubber bag”)
3. Set out buckets, thermometer and blubber bags (one for each group)

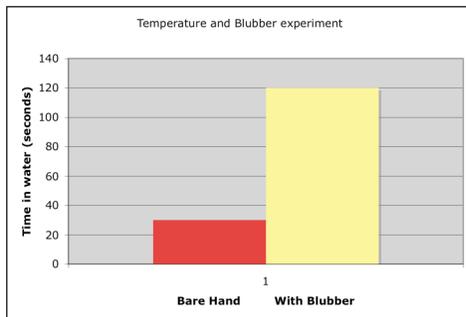
### Background

Whales are warm blooded marine mammals that can tolerate cold water temperatures. Whales use blubber as an insulation layer to help maintain the energy and warmth when they dive to cool depths or travel to cold waters such as in Alaska. The blubber layer is a thick (6 inches) layer of fat that is found under the skin.



## Procedure

1. Fill each groups bucket with ice and water
2. Have the students place their bare left hand in the bucket and feel the cold water  
Record the temperature  
Record how long they can keep their hand in there.
3. Now have the student place their right hand in the blubber bag by wrapping it around their hand (they do not need to put their hand inside the bag) and place their hand in the water  
Record the temperature  
Record how long they can keep it in there now.
4. Ask students to describe the differences they experienced between the water with the blubber and the water without
5. Have students present results in a table and then make a bar graph that compares the time in the water (y- axis) versus the bare hand and Blubber (on the x-axis). (see example below)



Method	Time in Water (seconds)
Bare Hand	30
With Blubber	120

Wrap up the lesson with a class discussion about blubber.

What is it?

A thick layer of fat under the skin

How thick is it?

About 6 inches thick in Humpbacks

What are the uses and benefits?

Insulation prevents heat loss

Why did people kill whales for blubber?

Blubber can be used in lamp oil or food.

## Assessments

Students complete the whale research notebook

## Resources

Marine Mammal Center

## Extension Activities

Design another experiment with blubber and discuss its role in buoyancy. For example do items that have more fat float more easily? Have students test the buoyancy of different items and record observations.