

Student Sheet

Name \_\_\_\_\_

Period \_\_\_\_\_

**Title: Adaptations to Life in Cold Water**

**Introduction:**

Seals are mammals, just like you or your pet dog or cat. They are “warm blooded” and must be able to protect themselves against the cold water in the Polar Regions. The water in the Antarctic and Arctic is about 1.8 degrees below freezing and you would only survive 1-2 minutes in that temperature without protection. But, seals do very well in these conditions. How do they do that? Today you will be conducting an experiment to help you find out.

**Procedures:**

1. Bring the following materials to your table: 4 plastic bags, 1 can of shortening, one plastic container with cold water and ice, a set of weights, masking tape, and a stopwatch.
2. Cover one hand with a plastic bag.
3. Put a generous amount of solid shortening into another bag. Put the plastic-covered hand into the bag with the shortening. Knead the shortening to make sure the hand is completely surrounded by shortening.
4. Wrap masking tape around the portion of the bag covering your wrist to seal the bag (optional).
5. Cover your other hand with two plastic bags (without shortening).
6. Place both hands simultaneously into the plastic container.
7. Have another group member time how long you can keep each hand under water.
8. Allow everyone in your group to have a turn.
9. Remove the bags from your hands and seal the bags so that water won't get in. Attach weights to the **outer** bag of each “glove.”
10. Put the bags into the bucket of water. Record how much weight each bag can hold before it sinks to the bottom.

**Data:**

Table 1: Amount of time hands are in water

Student Name	Time-shortening hand	Time- non-shortening hand

Table 2: Amount of weight until it sinks

	Amount of weight added before it sank
“Glove” with shortening	
“Glove without shortening.	

**Analysis:**

1. Which hand was the control in your experiment?
2. Which hand were you able to keep in the cold water longer?
3. What would the shortening represent on an Arctic animal?
4. What “glove” held more weight? Why?
5. So what other advantages would blubber give an ocean animal?
6. Create a bar graph from data Table 1. Be sure make a key that shows which color represents which hand.

**Conclusion:** Write something new you learned today.