

Day 5 Experiment

ARCTIC EXPLORATION

EXPLORING QUESTIONS AND CONDITIONS OF ARCTIC LIFE

Materials

- Rulers, several per table
- Non-latex gloves, 1 pair per child
- Large bowl of ice water (in the center of each table)
- Large can/bowl of vegetable shortening
- Question Cards (see DVD-ROM, 1 set per table)
- Timer

Pre-Prep

1. Photocopy the question cards and put each set on the tables, along with the other supplies. Adult table leaders will lead question card discussion after experiment is completed.

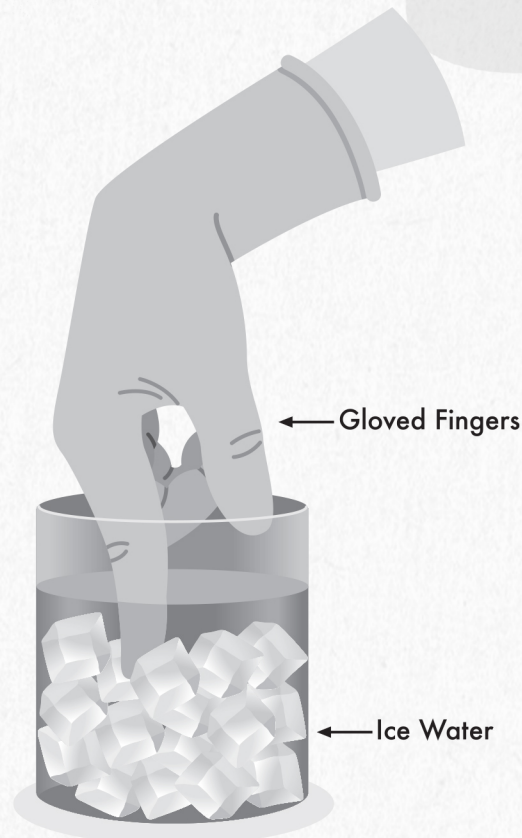
Class Time Directions

What's your favorite Arctic animal? Take responses. **Today, we're going to explore questions people often have when they think about animals living in the Arctic. Our first question is: How do animals, like seals, walruses, and whales, stay warm in the icy waters of the ocean? Take a moment to discuss this at your table. Do so.**

One idea people have had is that all these animals must have a thicker layer of skin or fat that helps keep them warm. This special layer of fat is called "blubber." Raise your hand if you've heard of blubber. Do so. Blubber is a thick layer of fatty tissue that acts as a heat insulator and stores energy. An insulator keeps heat from moving from one place to another. In the Arctic, that would keep heat from leaving the bodies of these animals, so they wouldn't feel the cold of the air and water. Blood vessels in the fatty tissue get smaller, so that reduces blood flow and helps reduce the amount of energy needed to heat the body. Animal blubber covers the entire body, except for the fins and flippers. Blubber may be one of the main reasons why these animals stay warm and survive from year to year in the Arctic.


Let's do an experiment to see how fat can be a good insulator of heat. This will help us think about our question—How do animals, like seals, walruses, and whales, stay warm in the icy waters of the ocean?

1. **Put one glove on your hand. When I say, "Dip," dip your gloved index finger into the bowl of ice water and leave**



it there for one minute. Ready, DIP! Start timer for one minute.

2. **Remove your index finger from the ice water. On a scale from 1 to 10, 1 meaning "I really couldn't tell any difference" and 10 meaning "It's so cold, my finger hurts and I can't feel anything with it," decide your level of cold. Share with your table your cold number. Do so.**
3. **Put the other glove on your other hand. Cover that index finger with vegetable shortening. Use your hand to mold it around the finger. Use the ruler to measure the thickness of the shortening. Be sure it's about $\frac{1}{4}$ – $\frac{1}{2}$ inch thick all around the finger.**
4. **On my signal, put the vegetable shortening finger into the ice water for exactly one minute. I'll be the timer. Wait one minute.**
5. **On a scale from 1 to 10, how cold does this finger feel? Share with your table. Do so. How does it feel compared to the finger not covered in vegetable shortening? Was**



it warmer, colder, or the same as the first finger? Share with your table. Do so.

6. **Before we discuss our results and conclusions, let me show you how to remove your gloves.** Demonstrate how to pull gloves off so they are inside-out. Have explorers put them in a pile in the center of the table for later clean-up.
7. **Now let me read to you the main ingredients in vegetable shortening—soybean oil, hydrogenated palm oil, and palm oil. These oils contain saturated fat. Does**

that sound familiar? That's right. Blubber and vegetable shortening both have fat in them. How many of you found the vegetable shortening finger was warmer? Take show of hands. **Does this help you understand how God created these Arctic animals with the ability to survive such extreme cold?**

8. **With the time remaining, let's explore other questions people ask about animals in the Arctic.** Read the questions on your tables and share your thoughts. Then turn the cards over to read the answers.
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