



Keeping Cozy in the Killer Cold

Annotation

Animals in the Arctic and Antarctic regions are subjected to violently cold temperatures. Still, amidst these treacherous conditions, these animals have adapted to be able not only to survive but also to thrive in the harsh cold. This laboratory activity will demonstrate one of the mechanisms used by these animals to survive.

Primary Learning Outcomes

How do animals in extremely cold environments keep warm? What are some of the positive effects of excess fat for animals living in a frigid aquatic environment?

Assessed Georgia Performance Standards

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SCSh8. Students will understand important features of the process of scientific inquiry.

SPS7. Students will relate transformations and flow of energy within a system.

SB4. Students will assess the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

Materials and Equipment

- 4 large, resealable, clear plastic bags
- Duct tape
- 1 lb. Vegetable shortening or lard
- Stopwatch
- Bucket of cold water with ice cubes
- Weights

Procedures/Activities

Step: 1 Duration: 45 minutes

1. Cover one hand with a plastic bag.
2. Put a generous amount of solid shortening into another bag and put the plastic-covered hand into the bag with the shortening. Make sure the hand is completely surrounded by shortening.



3. Use the duct tape to wrap the bag around your wrist, sealing the bag.
4. Cover the other hand with two plastic bags without shortening.
5. Place both hands simultaneously in the bucket of ice water.
6. Time how long each hand remains underwater.
7. Remove the bags from your hands and seal the bags so water won't get in. Attach weights to each of the outer bags.
8. Put the bags in the bucket of water. How much weight can each bag hold before it sinks to the bottom of the bucket?

Step 2: Duration 15 minutes

Discuss with the students the following concepts:

1. How is solid shortening like the blubber found on animals of the arctic and Antarctic regions?
2. What other advantages does blubber give marine animals besides warmth?

Total Duration

1 hour

Assessment

Students can be assessed through participation in laboratory activity, as well as through the grading of the laboratory questions. Examination questions regarding temperature control in the mammal and the role of excess fat in temperature control may also be used in student assessment.