

Blubber Gloves: It's All About Insulation

Lesson Concept	Living things have adaptations that make them well-suited to a specific environment.
Link	In the previous lesson, students learned island fox noses have special adaptations to help them meet their needs. In this lesson, they extend this idea to a marine, polar region to investigate how the adaptation of insulation optimizes animals' survival in a specific environment. In the next lesson, students will how plant seeds are adapted for dispersal in a variety of ways.
Time	Approximately 60 minutes
Materials	<p><u>Whole Class</u></p> <p>Pictures of Adaptations (see example)</p> <p>Three-column chart (see advance preparation)</p> <p>Ice chest/bucket (one for each group is ideal, but groups can share)</p> <p>Ice water</p> <p>Thermometer</p> <p>Clock (to time submersion with bare hand)</p> <p><u>Per Group (groups of 5-7)</u></p> <p>Set of "blubber gloves," one for each group, which require:</p> <ul style="list-style-type: none">I Pair of half-gallon Ziploc plastic bagsDuct tape2-3 large cans of shortening/lard, such as Crisco <p><u>Individual</u></p> <p>Recording sheet</p> <p>Evaluation form</p>
Advance preparation	<ol style="list-style-type: none">1. Make multiple sets of "blubber gloves":<ul style="list-style-type: none">- Fill two of the bags with shortening, and seal. You will seal these two bags together later to make one glove. (Fill the bags enough to cover a hand and provide an adequate amount of covering or insulation when a hand is inserted between the two bags. This is approximately 5 cups in each bag, about 10 cups for each glove.)

- Seal the two bags together with duct tape, around three edges so that the top is open in order to insert hand.
- 2. Reproduce recording sheet and evaluation forms, one for each student.
- 3. Make 3 column chart with these column headers: organism, adaptation, need met

Procedure:

Engage (5-7 minutes) Living things have adaptations that make them well-suited to a specific environment.

1. Display pictures of animals and plants. Ask students to describe the adaptations the plants and animals have that make them well suited to their environment (e.g. eagle claws help them hunt, polar bear fur helps them camouflage, cactus spikes give them protection, etc.). Write the following sentence frame, if needed, to guide their discussion: "A _____ has _____ to _____."
2. Record their responses on a three-column chart, with the first column labeled "organism", the second labeled "adaptation", and the third labeled "need met". For example, organism-eagle; adaptation-sharp claws; need met-get food.
3. Explain that today they will explore how marine mammals have a special adaptation to help them meet their needs.

Explore/Explain (30 minutes) Insulation is a special adaptation that makes marine mammals well-suited to harsh, freezing cold environments.

4. Distribute the recording sheets, one for each student.
5. Show students the bucket/cooler of ice water and have a student use the thermometer to record the temperature of the water.
6. Have students write their prediction of how long they think they will be able to submerge their bare hand in the ice water.
7. Give each student a chance to dip their bare hand in the ice water and record the amount of time their hand was submerged.
8. Show the students the gloves and let them know the gloves represent the blubber that marine mammals have. Ask, "Are marine mammals warm or cold-blooded?"

Teacher note: warm-blooded animals have adaptations that internally regulate their temperature, while cold-blooded animals have to rely on external factors to do so. Mammals are warm-blooded animals.

9. Ask students to predict how the "gloved hand" will affect the time they can keep their hand in the water. Will it be longer, shorter, or the same as their bare hand?
10. Divide students into groups of 5-7.
11. Give students the blubber gloves and have them take turns inserting their hands into the gloves and dipping the gloves in the ice water bath.

12. As they do this, ask students to answer the following questions and record their answers on the recording sheet:

- How cold does the water feel before and after you put on the gloves?
- Why would a layer of fat help marine mammals survive?

Teacher note: one common misconception students have about insulation is that it keeps the cold out, rather than keeping the heat in. Clarify this point: Tell them that heat flows from hot to cold, and that insulation materials slow down the rate that heat passes through the material.

13. Ask students if they can think of any other use for blubber to help animals meet their needs. Accept responses and then explain that blubber is an adaptation that has **another** specific purpose, which is to serve as energy storage for the winter months when food sources are limited. This means that animals, no matter where they live, that have limited food sources in the winter might have blubber as an adaptation.

Extend/Evaluate (15 minutes) *Living things have adaptations that make them well-suited to a specific environment*

14. Distribute the evaluation form and collect when done.

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Recording Sheet

1. I predict I will be able to submerge my bare hand in the ice water for _____.
2. I was able to submerge my bare hand for _____

3. I predict that with my “gloved hand” I will be able to submerge my hand (pick one) for the same time, less time, more time as my bare hand.

4. Draw a picture of what you did in the experiment:

5. How did the water feel?
 - *Before I put on the blubber gloves,* _____

 - *After I put on the blubber gloves,* _____

6. *A layer of blubber insulation (fat) helps animals* _____
_____.

7. *Besides insulation, I learned that blubber is also used to* _____
_____.

8. *This helps animals meet their needs because* _____
_____.

Name _____

Blubber Glove Evaluation

If walruses, seals, polar bears and penguins have blubber, what type of environment do you think they would live in? How does this adaptation help them?

Gila monsters are a type of lizard that live in the hot desert. Scientists have discovered that these lizards have blubber in their tails. What do you think this adaptation does to help the lizard survive?



What is a question you still have about this topic?

Examples of Adaptation Pictures

