Teacher Backgrounder

Topic: Blubber: Keeping Warm with Arctic Animals
Grades: K-2

Cross-curricular Connections:

- [ ] Social Studies
- [x] Language Arts
- [x] Science
- [ ] Math
- [ ] Arts

Context:

Whaling was one of the most prosperous industries in the 1800s and New Bedford, MA, was its capital. Many whales were killed for their blubber, a thick layer of fat below the skin of marine mammals. That blubber was then boiled in order to make oil for lighting and lubrication. Whale blubber ranges in thickness, the greatest being upwards of 50 cm (19.7 inches) thick in the bowhead whale.

In addition to whales, there are many other warm-blooded animals such as dolphins, porpoises, walruses, seals, penguins, and polar bears that rely on this adaptation -- since they can't put on a sweater for additional warmth. A layer of blubber helps these creatures retain heat, insulating them from changing temperatures, especially in water temperatures that are often -1.8°C (28.8°F). Blubber also helps provide the animals with energy and buoyancy. In this lesson, students will get to experience the protective properties of blubber.

Tech It Up:

- Share lesson materials via GOOGLE CLASSROOM or LMS
- Play the suggested videos
- Share the handouts digitally
- Devote time to exploring the recommended resources online

Learning Objectives:

Students will be able to ...

1. Describe the ways in which blubber helps animals.
2. Compare and contrast the ways animals depend on blubber.
3. Analyze the protective properties of blubber and formulate questions.
4. Experience how blubber forms an insulating layer of protection from cold water temperatures.

Materials & Preparation

INVESTIGATE The slides are designed for you to use with your whole class or to share directly with individual students. Review the slides and prepare to present or share the link with individual students.

INQUIRE Make copies of the corresponding handouts (1 per student) or share the PDFs digitally.

IMAGINE Review the Activity Guide. Watch this video from the museum as a demonstration beforehand to review the experiment's materials and process: https://youtu.be/wIOab2yPFlI

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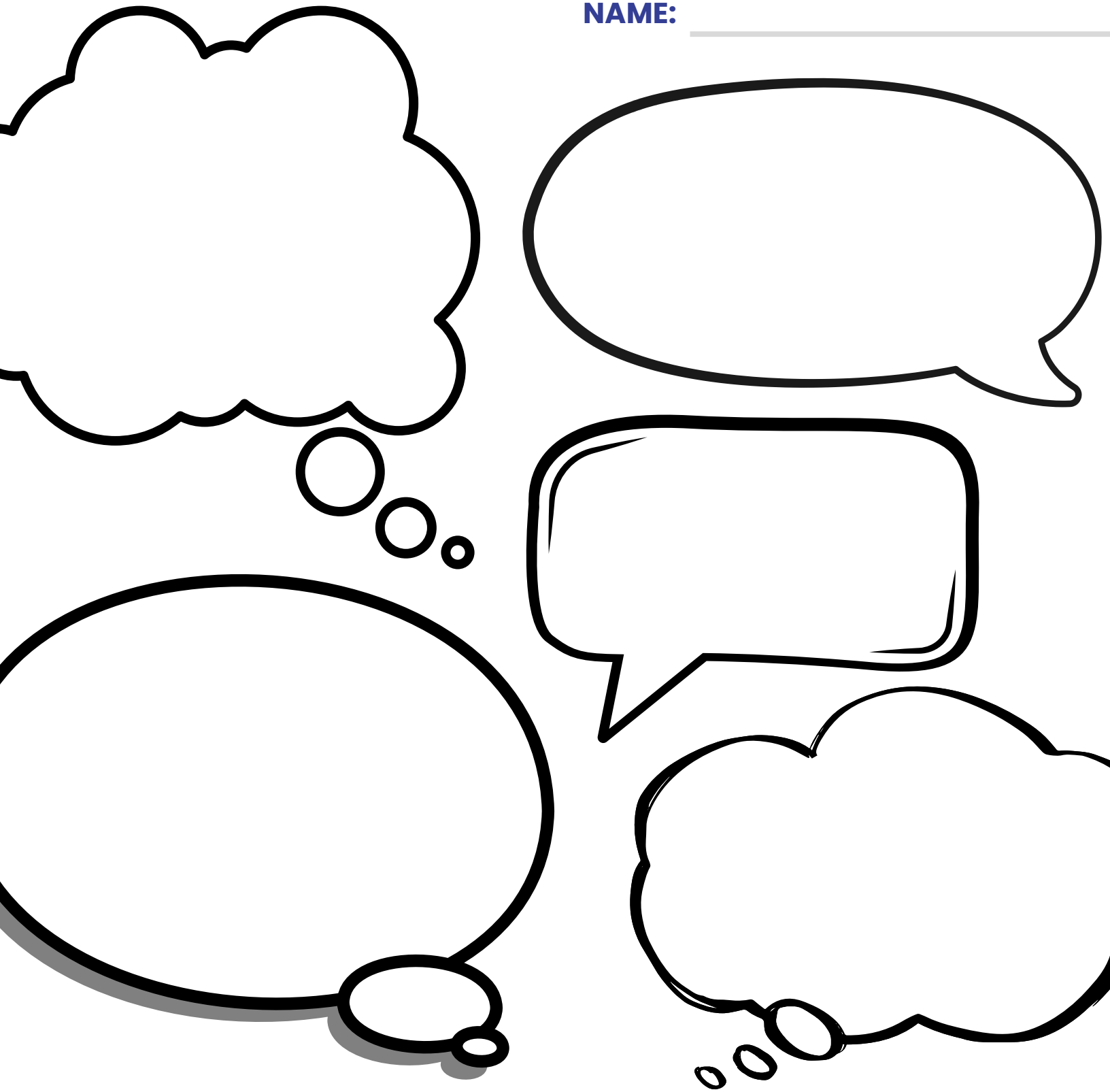
BLUBBER REFLECTIONS

Directions: Take a good look at the images. Add one question or thought to each bubble. What's on your mind?

NAME: _____



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Activity Guide: Blubber Gloves

Your Challenge

It's time for an experiment! Humans and whales are both warm blooded, but only whales have blubber. Do you want to see how blubber forms an insulating layer from the cold? You will use bags and cooking shortening to create a layer of "fat." You will test what it feels like to put your hand in icy cold water with and without the protective layer. Are you ready?

Materials

- 2 sealable bags
- spoon/spatula
- shortening
- duct tape
- bucket
- cold water
- ice
- OPT: thermometer
- OPT: timer

Time to Create

STEP 1: PREPARATION

1. Scoop about 2 cups of shortening into a sealable bag. Seal the bag closed, and then smoosh the shortening to line the inside of the bag.
2. Turn a second sealable bag inside out. Place that bag inside of the shortening-lined first bag. Push the edges of the sealable bags together to close them. Tape the edges with duct tape so that no shortening can escape. Use your hand to distribute the shortening evenly between the two bags. You've made a "blubber glove."
3. Fill a bucket full of cold water and ice.

Optional: Use a thermometer to measure the temperature of the water before and after you add ice. Use a timer to time how long you can keep your hand in the water (not too long!)

STEP 2: EXPERIMENTATION

1. Take turns and place your bare hand in the cold water. What does it feel like? How long can you stand the cold?
2. Let your hand warm up (or use your other hand) and place it inside the baggie "glove" so that it acts like a mitten. Now put your hand -- while inside the bag -- in the bucket of ice water. How does it feel different? How long can your hand stay in the cold water with the blubber glove?
3. Discuss how this experiment relates to an animal's layer of blubber.

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