

MY COAT IS WARMER THAN YOUR COAT

(MODIFIED FOR ADEED)

INSTRUCTIONS



Science Concept:

Different body coverings keep animals warm in cold temperatures. (NOTE: Students will make a deeper connection if they are familiar with the concept of different animals preferring different habitats prior to this lesson.)

Objectives:

The student will:

- explain hand coverings;
- describe similarities of hand and animal body coverings; and
- complete a Venn diagram.

GLEs Addressed:

Science

- [3] SB2.1 The student demonstrates an understanding of how energy can be transformed, transferred, and conserved by classifying materials as insulators or conductors (i.e., fur, metal, wood, plastic) and identifying their applications.
- [3] SA1.1 The student demonstrates an understanding of the attitudes and approaches to scientific inquiry by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

Math

- [2] S&P 1 The student demonstrates an ability to classify and organize data by constructing a variety of graphs from realistic situations. (M 61.1)
- [3] S&P 1 The student demonstrates an ability to classify and organize data by [designing an investigation and collecting, recording L] organizing, displaying, or explaining the classification of data in real-world problems (e.g., literature, self, or family), using bar graphs, and [Venn diagrams L].

Vocabulary:

- blubber** - the fat of sea mammals, especially whales and seals
- ice** - frozen water
- polar** - relating to the North or South Pole: the polar regions

Materials:

- Large containers (one per group)
- 15 resealable bags per group of six students
- Shortening
- Feathers
- Fur
- De Beer, H. (1987). *Little polar bear*. New York, NY: North-South Books.
- Jenkins, M., and Chapman, J. (1999). *The emperor's egg*. Cambridge, MA: Candlewick Press.
- 2 hats
- 2 scarves
- 2 jackets
- 2 pairs of mittens
- 2 sets of boots
- 2 safety cones
- Stopwatch (one per group)
- Science Journal
- STUDENT WORKSHEET: "Blubber Data Sheet"
- STUDENT WORKSHEET: "Venn Diagram"

Activity Preparation:

1. Fill a resealable bag half-full with shortening to make a “blubber bag.” Take a second bag and turn it inside out. Insert your hand into the bag that is now inside out, and carefully insert it into the bag with the shortening. Match up the seals and seal the bags together. Gently knead the shortening to spread it as evenly through the bag as possible.
2. Repeat Activity Preparation 1 to create two additional bags with shortening.
3. Create two bags with feathers and two bags with fur similar to how the shortening bags were created. When adding fur, cut the fur into two squares, slightly smaller than the inside of the plastic bag, and place them so that students’ hands will go between the fur.
4. Place the feather bag inside a blubber bag (feather bag needs to be felt first). Do the same with a bag of fur and shortening. This should result in one bag of each of the following: shortening; feathers; fur; shortening and fur; shortening and feathers; and air. Each group of six students should have all of these bags to share.

Activity Procedure:

Please refer to the assessment task and scoring rubric located at the end of these instructions. Discuss the assessment descriptors with the class before teaching this lesson.

Gear Up

Process Skills: observing and communicating

1. Ask the class what they need to wear to stay warm in a polar climate. Discuss.
2. Explain the class is going to play a game called “The Polar Relay Game.” Divide students into two teams and take the class outside. Set safety cones at least 9 meters (30 feet) apart from each other to designate two end points. Instruct each team to stand in a line (single file) behind a safety cone on the same side. Near the opposite cone, line up two sets of the following gear in order: hat, scarf, jacket, mittens, and boots. Explain this is a relay race. The goal is to put on or carry all the gear past the finish line.
3. At the signal, the first student in each line should run to the opposite cone, put on the hat, run back, and give the hat to the next person in the line. The next team member puts on the hat, runs to the equipment line at the opposite cone, puts on the scarf, runs back to the team, and gives both the hat and scarf to the next team member. The relay race continues until the last player in one of the lines is wearing all of the items and crosses the finish line to win.
4. After the race, return to the classroom and discuss as a class why a person would want to dress warm for cold weather. Ask students if animals need similar items to stay warm. Ask what kinds of animal coverings animals have to help them stay warm in cold climates.
5. Display the covers of the two books: *Little Polar Bear* and *The Emperor’s Egg*. Ask students how they think the polar bear and penguin survive in the cold Arctic and Antarctic climates. Read each book, providing polar bear and penguin facts. Ask students what the two animals had that covered them to keep them warm. (One had fur, the other had feathers). Ask students how they can layer their clothes to keep warm outside when it is cold.

Explore

Process Skills: observing, communicating, and describing

6. Explain students will have an opportunity to explore what it might be like for the little polar bear and baby Emperor penguin in the polar climate. Divide students into groups of six and distribute the STUDENT WORKSHEET: “Blubber Data Sheet,” a container of ice water, a stopwatch, and one of each type of bag: shortening (blubber), feathers, fur, shortening and fur, shortening and feathers, and air.
7. In pairs, instruct students to take turns putting on their bags and placing them in the ice water. Students should observe how warm or cold each bag is relative to the other bags. (NOTE: Students should be very careful not to get water inside the bags, as it will change the perception of cold.) One person in each pair should serve as the timer. The timer should time the other student for one minute. Record data on the STUDENT WORKSHEET: “Blubber Data Sheet.” After one student in the pair has explored with all six bags switch so the other partner explores all six bags.

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8. In their science journals, ask students to explain how at least two of the bags kept their hand warm. They may write about more than two bags.

Generalize

Process Skills: describing, communicating, classifying, and observing

9. As a class, discuss the answers to the following questions:
 - a. Which hand covering provided the most warmth in the cold water? Discuss results of the data collected.
 - b. What do humans do to warm up if we are cold?
 - c. If humans were to stay in water for long periods of time, what would we need to be wearing to keep warm?
 - d. What other kinds of covering can humans wear to keep warm since we don't have blubber?
 - e. How are the polar bear and penguin the same when keeping warm in cold temperatures?
 - f. How are the polar bear and penguin different in their body coverings?
 - g. Would any animal be able to live in the polar climate? Why? Why not?

Apply

Process Skills: describing, inferring, communicating, and observing

10. Ask students to write down the coverings they would use to create a winter coat to keep warm. Instruct students to draw a picture of their coat. Encourage creativity. Alternatively, students may describe the things from the ground or trees that they could use to keep warm if they were in the woods or camping.

Extension Ideas:

Process Skills: observing

Extend the student investigation by measuring the temperature inside each blubber bag at regular intervals over a span of 10-15 minutes.

Answers to Student Worksheet:

Student answers will vary.



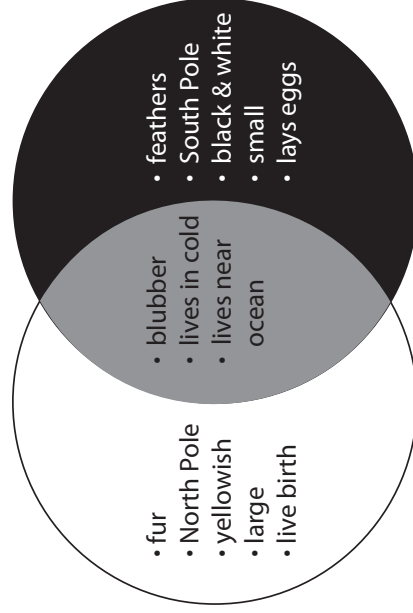
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RUBRIC

Assessment Task

Give students STUDENT WORKSHEET "Venn diagram". Ask them to write at least one fact comparing/contrasting a polar bear and a penguin in each section. At the bottom of the page, students will describe how at least two of the hand coverings explored are similar to a polar bear's or penguin's body covering.

Venn Diagram:



*Teacher example - this should not be shown to students

Polar Bear Penguin

Rubric

Objective	GLE	Below Proficient	Proficient	Above Proficient
The student will explain hand coverings.	[3] SB2.1	The student is able to explain one or no hand coverings and why it kept his or her hand warm.	The student is able to explain two hand coverings and why they kept his or her hand warm.	The student is able to explain three or more hand coverings and why they kept his or her hand warm.
The student describes similarities of hand and animal body coverings.	[3] SA1.1	The student describes how one or none of the hand covering bags are similar to a polar bear's or penguin's body covering.	The student describes how two of the hand covering bags are similar to a polar bear's or penguin's body covering.	The student describes how three of the hand covering bags are similar to a polar bear's or penguin's body covering.
The student completes a Venn diagram.	[2] S&P-1	The student completes two or less sections of a Venn diagram with one fact comparing and contrasting a polar bear and penguin.	The student completes all three sections of a Venn diagram with one fact comparing and contrasting a polar bear and penguin.	The student completes all three sections of a Venn diagram with two or more facts comparing and contrasting a polar bear and penguin.

NAME: _____

BLUBBER DATA SHEET

Directions: Draw a picture of each glove. Circle the glove that kept your hand the warmest after one minute.

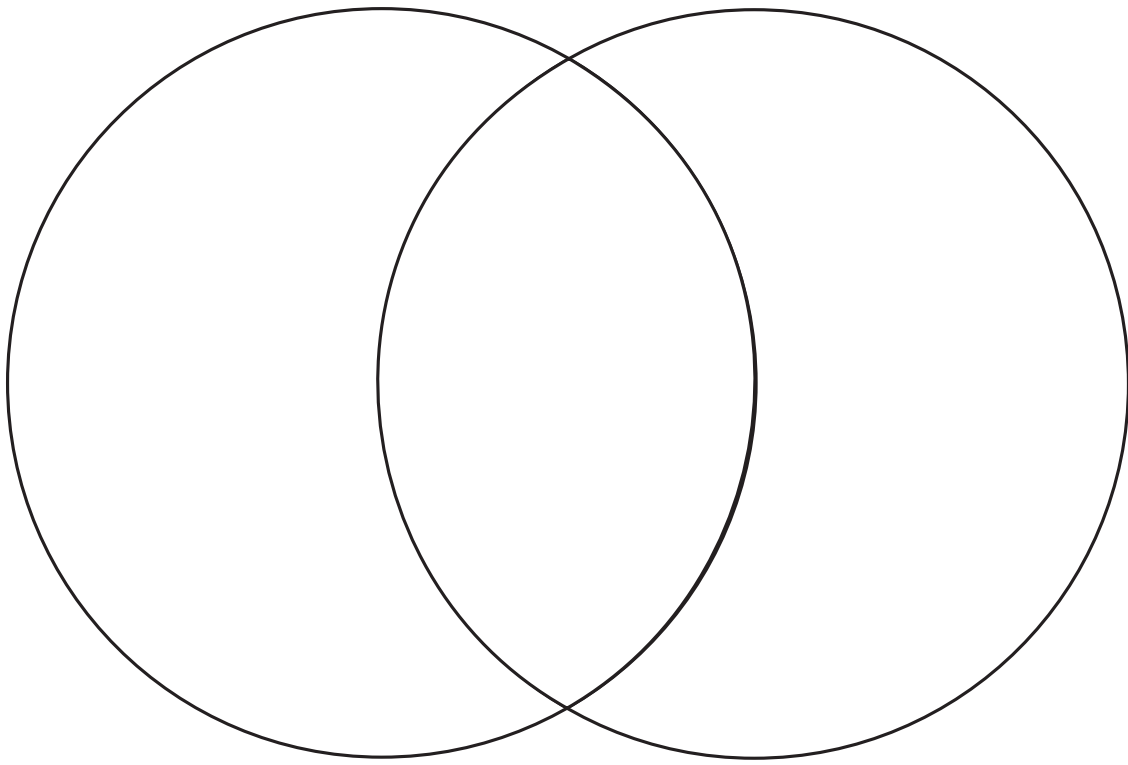
Glove #1: Shortening (blubber)	Glove #2: Feathers
Glove #3: Fur	Glove #4: Blubber & Fur
Glove #5: Blubber & Feathers	Glove #6: Air

NAME: _____

VENN DIAGRAM

Directions: Write at least one fact comparing/contrasting a polar bear and a penguin in each section of the Venn diagram below.

Venn Diagram:



Polar Bear

Penguin

Directions: Describe how at least two of the hand coverings explored are similar to a polar bear's or a penguin's body covering.
