Help! Paisley Polar Bear is Freezing!

Human Problems Can Be Solved by Mimicking Animal Solutions

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Grade Level	1st Grade	**Time Frame**	30 min sessions
Subject	English/Language Arts, Science	**Duration**	3-4 class periods
Course	Life Science		

Essential Question

How do humans mimic animals to help them survive, grow, and meet their needs?

Summary

In this lesson, students will be given a picture of a polar bear missing some fur. They will also receive a handout with a picture of a cartoon person missing a coat in the snow. Students will be provided with art supplies to give the polar bear some fur and design a coat for the cartoon person so they can both be warm.

Snapshot

Engage

Students are shown ice they can see and touch. Students then describe the properties of ice and watch a short video clip of a polar bear living in an icy habitat.

Explore

Students listen to a book about polar bears and add information to an Anchor Chart. Then, students create a coat to keep a polar bear cutout warm.

Explain

Students look at a picture of a cold child. Then, they use the information they learned about polar bears and how they stay warm to help them create clothing that will keep a person warm.

Extend

Students revisit the essential question and listen to the story *Snowy Bear* by Tony Mitton. Then, they complete a handout showing how each character in the story stays warm in the winter.

Evaluate

Students work in groups to match animal structures to human inventions with cards. As students match the cards, they talk in groups and share their reasoning for why that human idea came from that animal. Then, students write a sentence about one of the card matches.

Standards

Oklahoma Academic Standards (1st Grade)

1.LS3: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*
1.LS1.1.6: Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.

Oklahoma Academic Standards for English Language Arts (Grade 1)

1.4.W.1: Students will use domain-appropriate vocabulary to communicate ideas in writing with guidance and support.
1.5.W.2: Students will compose grammatically correct simple and compound sentences and questions (interrogatives) with appropriate end marks.

Attachments

- Biomimicry Card Match—Help! Paisley Polar Bear is Freezing! - Spanish.docx
- Biomimicry Card Match—Help! Paisley Polar Bear is Freezing! - Spanish.pdf
- Biomimicry Card Match—Help! Paisley Polar Bear is Freezing!.docx
- Biomimicry Card Match—Help! Paisley Polar Bear is Freezing!.pdf
- Children Without Coats Cutouts.docx
- Children Without Coats Cutouts.pdf
- Freezing Cold Child—Help! Paisley Polar Bear is Freezing!.png
- Paisley Polar Bear—Help! Paisley Polar Bear is Freezing!.jpg
- Polar Bear Cutout—Help! Paisley Polar Bear is Freezing!.docx
- Polar Bear Cutout—Help! Paisley Polar Bear is Freezing!.pdf
- San Diego Zoo Data Collection Sheet—Help! Paisley Polar Bear is Freezing! - Spanish.docx
- San Diego Zoo Data Collection Sheet—Help! Paisley Polar Bear is Freezing! - Spanish.pdf
- San Diego Zoo Data Collection Sheet—Help! Paisley Polar Bear is Freezing!.docx
- San Diego Zoo Data Collection Sheet—Help! Paisley Polar Bear is Freezing!.pdf
- Snowy Bear Warm in Winter—Help! Paisley Polar Bear is Freezing! - Spanish.docx
- Snowy Bear Warm in Winter—Help! Paisley Polar Bear is Freezing! - Spanish.pdf
- Snowy Bear Warm in Winter—Help! Paisley Polar Bear is Freezing!.docx
- Snowy Bear Warm in Winter—Help! Paisley Polar Bear is Freezing!.pdf

Materials

- Ice and ice bucket
- *National Geographic: Polar Bears* by Laura Marsh or a polar bear book from Epic! books
- Anchor Chart paper
- Paisley Polar Bear photo (attached)
- Polar Bear Cutout (attached; one per student)
- Art supplies (crayons, markers, glue sticks or glue, white yarn, fabric , buttons, pipe cleaners, pompoms, cotton balls)
- Freezing Cold Child photo (attached)
- Children Without Coats Cutouts (attached; one cutout per student)
- *Snowy Bear* by Tony Mitton
- Snowy Bear Warm in Winter Handout (attached; one per student)
- Biomimicry Card Match (attached; one set per group)
- San Diego Zoo Data Collection Sheet (attached)

10 minutes

Engage

Teacher's Note

The NGSS Crosscutting Concept, structure, and function is focused on in this lesson. For example, lobsters have the structure of claws, and their function is to protect themselves and get food. Biomimicry is when humans use the idea from that structure to help them design something to meet their needs; such as tongs for grabbing something to protect our hands.

Teacher's Note: Lesson Preparation

Before beginning the lesson, print the attached **Polar Bear Cutout** and the **Children Without Coats Cutouts** and gather the materials needed for students to create coats for them.

In addition, print the attached **Biomimicry Card Match** document and cut out each card to create a deck (one deck per pair or group of students). Use card stock if available so that cards can be kept and reused.

To begin the lesson, show students ice in an ice bucket. You can distribute the ice in small cups so that the students have a chance to touch it. Next, ask students to describe the ice.

Possible Student Responses

Students might respond by saying that ice is cold, hard, clear, white, or square-shaped.

Follow up with these additional questions:

- What is ice made from?
- Where do we find ice?
- When do we have ice in our yards?

Next, show students the polar bear video and have the class discuss how cold the ice is.

Embedded video
https://youtube.com/watch?v=CbILj_CYqno

Using the information from the video, ask students to help fill in the Anchor Chart about polar bears. Across the top of the chart paper, write "Information About Polar Bears." You will add more information to this chart later on in the lesson.

Possible Student Responses

Students might provide facts about polar bears such as: they are white, they are big, they have cute babies, they roll in the snow, or they walk on snow and ice.

30 minutes

Explore

Read a book about polar bears with students, such as *National Geographic Readers: Polar Bears* by Laura Marsh or a book about polar bears from Epic! Books. After finishing the book, ask students to help you add facts to the Anchor Chart you created earlier.

Possible Student Responses

Students might provide additional facts such as:

- Lives in cold, icy places
- Has thick fur
- Has claws to walk on the ice
- Eats meat
- Their babies are called cubs
- Likes to swim

Next, show students the attached **Paisley Polar Bear** photo.

Use the Think-Pair-Share strategy and have students think about what they have learned that helps the polar bear to stay warm and live where it is cold and icy. Have students share with a partner and then as a class.

The class will most likely agree that the polar bear's fur is important. Explain to students that a polar bear's fur has several layers that help keep them dry when they swim.

Next, pass out the attached **Polar Bear Cutout** to each student. Have students use the materials provided to add "fur" to the polar bear. As students are working, ask them to explain the purpose of what they are adding to their polar bears. Encourage layering and remind them not to forget about the bear's head and paws.

30 minutes

Explain

Now, share the attached **Freezing Cold Child** photo and ask students how they think the child is feeling and what makes them think that.

Ask students what information they learned about polar bears could be used to help make the child warm. Revisit the information they added to the Anchor Chart.

Guide students with questions such as, "What did you do to help Paisley Polar Bear stay warm?" and "What do people do to keep themselves warm?" Help students focus on details like layering, additional clothing, and using warm materials.

Pass out a copy of the attached **Children Without Coats Cutouts** to each student. Have students use the materials provided to create some clothes to keep the child warm.

After they have completed their characters, have students talk in pairs or table groups and compare their polar bear coats and their human coats. Then, have students write a sentence about comparing the polar bear's fur and the person's coat.

Teacher's Note

When students are preparing to write their sentences, consider using this sentence stem.

I think a coat is like polar bear fur because_____.

Students should demonstrate their understanding of multiple layers and how they keep polar bears and people warm.

30 minutes

Extend

Revisit the essential question by asking students, "Do you think humans learn things from animals that help them solve problems?" Have students share their ideas with their Elbow Partners, then have a short share out with the class.

Before reading *Snowy Bear*, explain to students that some animals stay "indoors" to stay warm and dry. Give students examples such as mice, shrews, and voles making underground tunnels and using snow like a blanket to shelter them from the bitter cold.

Next, read the story *Snowy Bear* by Tony Mitton. Explain to students that some of this book is true, but some of it is fiction.

As you read the story, pause to discuss how the fox had fur to stay warm and used a burrow underground to shelter from the cold. Follow with the how the owl used its feathers and its hole in a tree for warmth.

Then, discuss with students how humans sometimes stay indoors and use a heater or fireplace to stay warm.

Have them complete the attached **Snowy Bear Warm in Winter** handout with drawings or sentences to show how each animal stays warm in the winter.

20 minutes

Evaluate

Divide the class into small groups or pairs and use the Card Matching strategy. Give each group a set of the attached **Biomimicry Card Match** cards you prepared prior to the lesson. Have them match the animal and the human invention based on what humans have learned from that animal.

Biomimicry Card Match Pairs

- Bird wings/Airplanes
- Polar bear/Coat
- Fish tail/Boat rudder
- Turtles shell/Helmet
- Octopus tentacles/suction cup
- Mosquito stinger/Needle
- Flying squirrel/Wing suit
- Tree/Umbrella

As students work on matching their cards, circulate the room and ask students why they matched certain cards together. Listen carefully to their justifications for their matches. Students may correctly match the cards, but have incorrect reasoning.

Next, have students write a sentence about one of card pairs they matched together.

Teacher's Note

When students are preparing to write their sentences, consider using this sentence stem.

The _____ has a _____, and humans used this idea to make a _____.

Example: The turtle has a shell and humans used this idea to make a helmet.

Alternatively, provide students with different scenarios and ask how we learn from animals to solve problems.

For example:

- Birds can fly to travel more quickly. What did humans build? *(Humans built airplanes so that they could fly and travel to places quickly.)*
- Fish have gills to breathe underwater. What did humans develop? *(Humans developed scuba diving gear to breathe underwater.)*
- Sharks have sharp teeth to eat their food. What did humans create? *(Humans created forks to eat their food.)*

45 minutes

Opportunities for Advanced Students

Have students view different animals using the live cams at the San Diego Zoo. On the attached **San Diego Zoo Data Collection Sheet**, have students record the name of the animal, what they saw them doing, what structure (part of the body) they were using, and how humans might adapt that structure.

Example: Hippopotamus, swishing flies away, using his tail, fly swatter

Resources

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