

EXTREME SURVIVAL: ANTARCTICA!

GRADE LEVEL 2-3





Photo: BBC NHU

ANTARCTICA EDUCATOR GUIDE

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60 minute Lesson

Standards (NGSS):

3-LS4-3

Construct an argument with evidence that in particular habitats some organisms thrive, others barely survive, and others face extinction.

From the Film:

The film, *Antarctica*, showcases a variety of animals with incredible adaptations that allow them to survive extreme conditions. We see other adaptive behaviors such as antifreeze proteins in icefish, waterproof feathers of penguins, special vocal calls by young animals, and blubber in seals. We also see behaviors such as whale feeding, ice-cutting by seals, and nesting behaviors.

Lesson Overview:

Students will discuss the examples of animal adaptations and behaviors seen in the film. They will design and create a 2D or 3D model of an animal that would survive in Antarctica and discuss the adaptations that would give the animal an advantage (ex. Antifreeze in fish, feathers, blubber, ice-cutting, teeth, feeding behaviors). The educator will demonstrate the feeding behavior of humpback whales seen in the film using a model representation.

Materials:

- My Antarctic Animal Handout, p. 34 (one per student)
- Pictures, p. 33 of Antarctic animals from the film:
[See the Antarctica film Wildlife List here](#)
- Paper and Colored pencils or Markers for 2D Antarctic animal model
- Recycled materials for 3D model (optional)
This could include cardboard, paper, fabric, plastic bottles, egg cartons, etc.
- Tape or hot glue gun (optional)
- Large container filled with water
- Small sequins or other small object that will float
- Small strainer or slotted spoon with a handle (should be easily maneuvered in container)

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EDUCATOR PREP:

Print *My Antarctic Animal* Handout. If students are making a 3D model of their Antarctic Animal, prepare enough materials for each student. Print or prepare the Antarctic Animal photos to be digitally shared with students.

EDUCATOR GUIDE:

1. In the film, *Antarctica*, we observed many animals with special behaviors and adaptations that allow them to survive in an extreme environment. Ask students:

What is an adaptation?

An adaptation is a change or the process of change by which an organism or species becomes better suited to its environment. These changes are developed through natural selection and evolution over many generations.

What is a behavior?

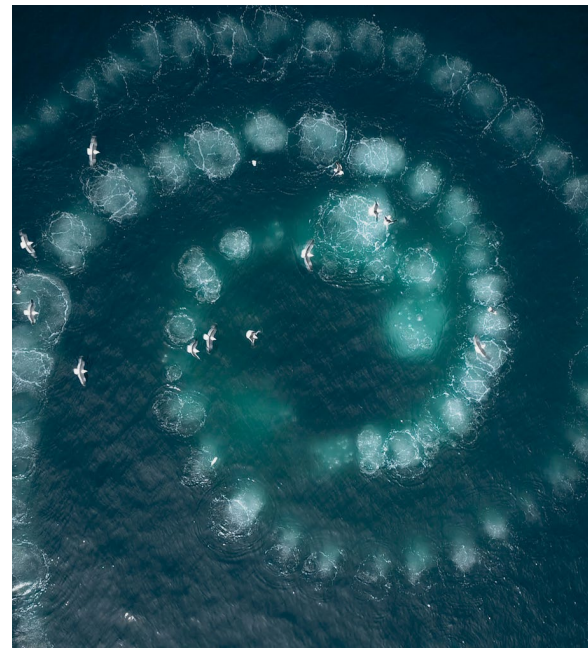
A behavior is the way in which an animal or person acts in response to a particular situation or stimulus.

Can you give me an example of special adaptations or behaviors humans have?

This question has many possible answers. For example, humans have opposable thumbs, which allow them to grip objects in a way that is different from animals. It gives them an advantage by allowing them to create tools and pick up smaller objects.

What are some special adaptations you saw in the film Antarctica?

Multiple answers are possible. Examples include the Gentoo Penguins shedding their down feathers to be able to swim, or seals, who have adapted the ability to chew the ice with its teeth creating space for itself to breathe. Another example is the icefish with the antifreeze protein that allows it to swim in icy waters.



Using a feeding technique called 'bubble netting' the humpback whales blow bubbles as they rise up under a shoal of krill. The bubbles act like a net to the krill, and the whales spiral inwards to concentrate the swarm.

Photo: BBC NHU

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2. Instruct students that you will demonstrate a special behavior observed in the film when the humpback whale is feeding on krill. Carefully pour the sequins into the large container filled with water. Inform students that the sequins represent the krill in the ocean. Use the strainer to carefully stir inside the container, starting at the outer edges and moving in a spiraling movement into the center. This should corral the sequins in the same way that the humpback whale corrals the krill. Scoop the sequins up while the water drains out of the strainer, which is reflective of the way whales can push out water while only ingesting the krill.

Ask students:

What would happen if I just scooped the strainer in the water?

The scooper would not pick up as many krill, so you would need to exert more energy to get the same amount of sustenance.

Why do you think the whale spirals around the krill to feed?

The whale has learned that creating the spirals traps the krill in a confined space, therefore allowing it to collect and eat a lot of them very quickly.

What would happen if we used a solid spoon to scoop up the krill?

It would also end up scooping up a lot of water which would reduce the amount of krill that is caught. It would also make the spoon very heavy and more difficult to move out of the water.

How is this model similar and different to what we saw in the film?

It uses the same spiral motion to corral the sequins and the slotted spoon is like the mouth of the whale. The difference is, unlike the strainer, the whale has to create this spiral from in the water using its body and energy.

3. Show students pictures of some of the Antarctic animals they observed in the film (icefish, penguin, anemone, sea star, seal, whale). Ask students what special behavior or adaptations each of these animals have that allow them to survive in Antarctica. Record the groups answers on chart paper or white board.

4. Hand out the *My Antarctic Animal* handout and inform students that they will create their own animal that lives in Antarctica, able to withstand the conditions and fit into the ecosystem.

5. Give students time to brainstorm. Have students brainstorm specific adaptations that would make their animal more likely to survive in Antarctica. After ten minutes of planning, have students share their design with a small group.

Educator Notes:

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6. As an extension activity, if time and supplies permit, allow students to create 3D models of their animals. Students also have the option to draw and color a final 2D model of their animal.

7. Once students are finished with their model, ask them to use their notebooks and reflect on their experience. Describe the adaptations of their animals. Use the following prompts:

Which animals were your inspiration for the animal that you designed?

Why did you choose these animals?

How do the adaptations of your animal give it an advantage and allow it to survive in Antarctica?

8. If time allows, or as an extension, have students create a story about their animal where they tell about the animal, its adaptations and how that helps them survive.



Antarctic Krill. The combined weight of every single krill together is likely heavier than any other animal species on the planet.

Photo: BBC NHU

Antarctica Animal Photos

Use the photographs below to give you inspiration for the animal that you are going to design to survive in Antarctica.

Photo: Shutterstock / Paul S. Wolf



Photo: Shutterstock / Andrea Izzotti



Photo: Shutterstock / Andrea Izzotti



Photo: Shutterstock / Charles Bergman



Photo: Shutterstock / Andrea Izzotti



Photo: Shutterstock / Lua Carlos Martins



My Antarctic Animal

Directions: Use the space below to design and draw an animal that could survive in Antarctica. This does not have to be an animal that already exists.

What special adaptations does your animal have?
