

4 Adélie Penguins In Peril

Although Adélie penguins are not listed as an endangered species by the IUCN Red List, they face several threats that could eventually lead to a more concerning status for these flightless birds. Natural threats to the Adélie penguins come in the form of predators like leopard seals, killer whales and south polar skuas. The



leopard seal is their most common threat, but will only prey on them when the penguins are in the water. Leopard seals only come to land to sleep and rest, so they will typically not bother the penguins

on the shore. In the water, penguins swimming in large groups are typically able to avoid being bothered by leopard seals all together. South polar skuas, a type of large bird, are only a threat to penguin eggs and unguarded chicks on land.

Human made threats to Adélie penguins are not quite as evident as their natural predators; however, unnatural threats are still of great concern when it comes to survival of these unique animals. At the top of this list is the threat of significant climate change, including the threat of rising temperatures in the home region of Adélie penguins. As a result of warmer temperatures, the Antarctic ecosystem and animals, like Adélie penguins, with cold-weather adaptation will be adversely impacted. Most notably, rising temperatures will cause sea ice to melt and disappear at a faster rate — ice that Adélie penguins, and many other animals, call home and depend on for survival. Krill, the main source of food for Adélie penguins, use sea ice to breed and feed under. Loss of ice could mean the loss of krill which could eventually lead to the loss of Adélie penguins.

While there are clearly a number of threats for Adélie penguins, there is also a great deal of conservation work taking place to help these animals and their homes. Adélie penguins are one of the most studied animals in the Antarctic region and research into their colonies allows scientists to better understand the effects of climate change and human impact in their area.

MAKING A POSITIVE DIFFERENCE FOR WILDLIFE

By sharing what you have learned about Adélie penguins, you are on your way to helping protect this unique species! Shared knowledge creates awareness and can lead to action. A positive attitude towards all wildlife can also help make a conservation impact when combined with actions that benefit the world around us. While you may never visit Antarctica or see an Adélie penguin in the wild, you probably do live with a wide variety of animals near your own home. Think about ways you can help these animals.

- **Observe wildlife from a distance.** Observing wildlife from a distance ensures that animals continue to depend on their natural instincts to find food and use nature's resources. Feeding wildlife can be dangerous and change their behavior. It's important to let wild animals be wild.
- **Choose pets wisely.** Though many regulations exist around the world to protect wild animals, the illegal pet trade still takes many wild animals directly from their homes. When the time comes to add a furry, feathery or scaly addition to your family, be sure you know where it came from.
- **Create habitats!** Consider creating a friendly place for wildlife to thrive in your yard. Provide a water source, a place for animals to live and plants that provide food. Before you know it, your backyard could be home to all kinds of insects, plants, and animals. The National Wildlife Federation can even certify your habitat as wildlife friendly!
- **Reduce waste.** Reduce your consumption (achieve a small "footprint"). Reuse items that normally are just tossed into the trash and recycle everything you can.
- **Make wise conservation choices.** Finding alternative ways to travel such as carpooling, biking and walking are all great options to lessen your impact on the environment.
- **Discover more.** Check out conservation organizations such as the Disney Conservation Fund (DCF) to learn more about the efforts to protect all kinds of wildlife in wild places. You can even visit an AZA-accredited zoo or aquarium to learn about other wildlife and conservation efforts being made around the world to protect animals like Adélie penguins.



LESSON PLAN 4 | PENGUINS IN PERIL

Grades 2-3 | Content Areas Science, Art, ELA



Antarctic Predator Adaptations

ESSENTIAL QUESTIONS

What predators put Adélie penguins in peril? What adaptations make predators of Adélie penguins successful hunters?

Materials

- toilet paper rolls
- chicken wire
- medium foam ball
- smooth and crumpled newspapers
- cardboard
- shoe boxes
- plastic bottles
- white glue
- water
- medium and large craft brushes for gluing
- bowls for mixing paste
- acrylic paints
- paint brushes
- scissors, masking tape

Vocabulary

- adaptation
- paper maché
- predator
- prey
- stencil

WARM UP

- a) As a class, discuss how Antarctica is a harsh place, yet many animals are able to survive. Ask students to think about how Antarctic predators have **adapted** survival skills that allow them to thrive. View pictures of **predators** and video of their actions and then instruct students to select a penguin predator to create using **paper maché** techniques.
- b) Have students research their animal online or in books and make notes of interesting adaptations. As a class discuss how students' animal adaptations compare with other students' findings (teachers can use the Disney Nature Penguins Educator's Guide background sections to compare their findings). Next, ask students to sketch their animal, trace it on cardboard and cut out the tracing to make a stencil. The stencil will serve as the base shape for the sculpture.

Process

Making paper maché animal sculptures of Adélie penguin predators helps students identify predators' adaptive behaviors and physical features.

BUILDING AN ANTARCTIC PREDATOR

Instruct students to follow the steps below.

Creating the Basic Shape: Use a variety of materials to build the animal base shape — try a foam ball for circular shapes, toilet paper rolls for cylindrical shapes and tape crumpled newspaper into place to create shapes. To strengthen the base shape, cover all pieces with tape.

Forming the Body: Tear long and short newspaper strips and mix equal parts water and white glue. Place newspaper strips over the basic shape and paint a coat of glue mix over the strip to secure it to the base shape. Repeat the process one strip at a time until the whole basic shape is covered in a sturdy layer of newspaper strips.

Adding the Details: Once the paper maché is completely dried, paint animal details.

WRAP UP

- a) Ask students to gather in small groups with different predator designers to discuss what they learned through the design and problem-solving process. Suggest they use the following questions to guide their discussion.
- 1) Why did you choose your animal?
 - 2) What materials helped you mimic the shape of your animal?
 - 3) What was the easiest and most difficult part of working with paper maché?
 - 4) What was your favorite part of creating this artwork?
- b) Set up a classroom natural history or art museum. Organize the sculptures so that all the same predators are near each other. Instruct students to make 3x5 index cards with the name of their predator and a poster that labels adaptations on their sculptures. Ask students to take turns being "museum docents" or "tour guides," that will be prepared to share facts and answer questions about their predator while giving tours to each other, students from another class or parents during an open house.

LESSON PLAN 4 | PENGUINS IN PERIL

Grades 2-3 | Content Areas ELA & Science

Adaptation Survival Stories



ESSENTIAL QUESTION

Which Adélie penguin adaptations assist survival against predators - killer whales, leopard seals, skua gulls, giant petrels?

Materials

- Activity Sheet: *Semantic Analysis & Survival Stories*
- pencils
- colored pencils

Vocabulary

- adaptation
- survival
- camouflage
- creche
- down
- leopard seals
- giant petrels
- killer whales
- predators
- prey
- skuas

WARM UP

Discuss adventure survival stories students are familiar with, and how characters develop and overcome obstacles in harsh and challenging environments. Note how animals living in harsh environments, like Antarctica are constantly living out their own adventure survival stories and how today's students will imagine those through the lives of Adélie penguins. Review the definitions and examples of **adaptations**, **survival**, **predator** and **prey** as a class before proceeding.

Note on Genre

Adventure survival stories usually occur in the great outdoors. Characters must think quickly, depend on inner resolve and call on problem solving skills to overcome dangerous or threatening situations.

BECOMING ADVENTURE AUTHORS

Have students complete section A of *Activity Sheet: Semantic Analysis & Survival Stories* to help them prepare to write their survival stories. Explain that students will identify which adaptations could or could not help Adélie penguins survive encounters with specific predators and complete one together as a class before they complete the rest individually. Tell students they will then use their semantic analysis to complete Section B of the activity sheet before writing and illustrating a survival story that includes appropriate characters, setting and a happy ending.

WRAP UP

Ask students that wrote about the same predator to gather in small groups to share and compare their stories. Have students discuss whether or not they all chose to feature the same or different Adélie penguin adaptations in their stories and which adaptations were selected the most often and why.

Semantic Feature Analysis grids like on *Activity Sheet: Semantic Analysis & Survival Stories* help students consider how sets of things relate to one another. Analyzing a grid helps students make connections between sets and predict outcomes.



Activity
GRADES
2-3

SEMANTIC ANALYSIS & SURVIVAL STORIES

NAME _____

DATE _____

A Adélie Penguin Predators Semantic Analysis

Directions: Place an **X** for each adaptation that could help Adélie penguins survive encounters with the corresponding predators and a minus sign **-** where the adaptation would not be helpful for specific predators.

ADÉLIE PENGUIN ADAPTATIONS

PREDATORS: Killer Whales Leopard Seals Skua Gulls Giant Petrels

Camouflage of adults in water

- Black back blends with deep, dark waters when seen from above
- White belly blends with bright water surface when seen from below

Chicks — camouflage on land

- Fuzzy brown down may blend with shadows

Chicks — gather in creches

Adults — gather in groups to jump into waters

Adults — can swim 75 km per hour

(approx. 46 mph)

Adults — short pointed beak

Adults — launch or jump high out of the water and onto ice pack or land

	Killer Whales	Leopard Seals	Skua Gulls	Giant Petrels
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Chicks — gather in creches				
Adults — gather in groups to jump into waters				
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Adults — launch or jump high out of the water and onto ice pack or land				

B Write and draw a survival story

CHARACTERS

WHICH PENGUIN: **VS**

- Father Penguin
- Mother Penguin
- Chicks
- Juvenile Penguin

WHICH PREDATOR:

- Killer Whales
- Leopard Seals
- Skua Gulls
- Giant Petrels

SETTING/SCENARIO

WHAT OR WHERE:

- Sitting on nest
- Jumping into ocean
- On ice floe
- Waiting for mom
- Getting food for chicks
- Feeding on krill
- Waddling in colony

HAPPY ENDING

The adaptation(s) that help your penguin survive:

Grades 4-6 | Content Areas Science & ELA

Conceptual Models For Human Made Adélie Penguin Perils



ESSENTIAL QUESTION

How do human activities impact Adélie penguins?

Materials

- Activity Sheet: Human Made Penguin Perils Concept Model
- dry erase boards
- poster paper
- dry erase markers
- markers

Vocabulary

- climate change
- variable
- conceptual model
- deforestation
- global warming
- sea ice
- sea level



WARM UP

- Discuss some examples of **conceptual models** scientists make to represent how a system with observable and unobservable factors works. Some examples include the solar system or the human respiratory system. Ask students to think about how successful models can guide problem solving and predicting.
- Have students read a short article (see resource section for links) about the connection between increased rates of **sea ice** melting and **climate change** that may be caused by human made factors. Next, ask students to brainstorm other human made influences on the environment such as **deforestation**, the rise of carbon dioxide levels, landfill garbage creating methane, fossil fuel use, burning coal, creation of plastics and the release of carbon.



Some conceptual models focus on natural causes for climate change such as volcanic eruptions or solar variability that are beyond humankind's control. Other conceptual models focus on how humanity's activities impact global warming.

CREATING CONCEPTUAL MODELS

Have students gather in small groups of 2-3 individuals. Request that each group choose one human made influence to add to the variables on *Activity Sheet: Human Made Penguin Perils Concept Model*. Student groups will then follow the directions to create conceptual models of how human activity impacts climate change and puts Adélie penguins in peril.

WRAP UP

Ask students to share in a round-table format and discuss how the variables they chose impacted the relationship between the variables. Remind students that models are intended to be changed based on new evidence or collaborations with other scientists. Then, request students give peer to peer feedback by providing critique and giving at least one way the content or presentation of the model could be improved. Ask students to revise their models and propose solutions in large groups to reduce the threat to Adélie penguins or generate new questions that may fill in gaps in knowledge. Collect models into a class book and make it available in the science or library corner.

“The most common misunderstanding about science is that scientists seek and find truth. They don’t — they make and test models.... Making sense of anything means making models that can predict outcomes and accommodate observations. Truth is a model.”

— Neil Gershenfeld, American physicist, 2011

Activity
GRADES
4-6

HUMAN MADE PENGUIN PERILS CONCEPTUAL MODEL

NAME _____

DATE _____

Directions: Look at the example of a simple conceptual model with 2 variables, and the questions that are represented in the example. Answer the questions below and use your answers to sketch the first draft of a conceptual model on a dry erase board or scratch paper. Then, draw the second draft in the space below. Include the variables listed below and the human made influence of your choosing.

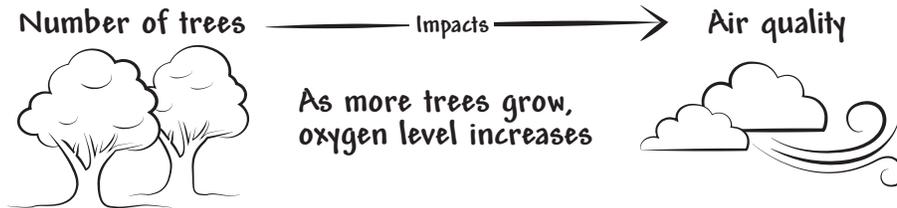
EXAMPLE

VARIABLES: NUMBER OF TREES AIR QUALITY

What is the issue? Air pollution

What is the relationship between the variables? More trees = more oxygen (resulting in improved air quality)

Include arrows and illustrations to represent the issue.



VARIABLES: ADÉLIE PENGUINS PEOPLE ANTARCTICA ICE
CLIMATE HUMAN MADE INFLUENCE: _____

What is the issue? _____

What is the relationship between the variables? _____

Include arrows and illustrations to represent the issue.

Grades 4-6 | Content Areas Art & Science

Recycled Plastics Penguin Sculpture



ESSENTIAL QUESTIONS

What is the purpose of WashedAshore.org? How can collecting plastics and using them to create a sculpture raise awareness of marine pollution? What are the issues created due to ocean pollution?

Materials

- Activity Sheet: *Think Tank Questions & Sculpture Directions*
- assortment of plastics in various colors
- fasteners
- wire
- glue guns
- glue dots
- tape
- non-toxic epoxy
- zip ties
- twisty ties
- rubber bands
- twine
- assorted binder clips
- poster boards
- markers

Vocabulary

- assemblage
- additive sculpture
- closed sculpture
- collaborative sculpture
- conservation
- exhibition
- freestanding
- marine debris
- open sculpture
- pollution
- public art
- sculpture base
- subtractive sculpture
- think tank

WARM UP

- Discuss how ocean pollution is a growing threat to Adélie penguins and other animals that depend on our oceans for survival. Introduce students to organizations that are making a difference for wildlife and wild places, like WashedAshore.org. Discuss how WashedAshore.org demonstrates how art can play a powerful role in raising awareness about cleaning up marine debris and could be changing consumer habits.
- Tell students to form think tanks of 4 members and assign one of the five “Think Tank questions” on *Activity Sheet: Think Tank Questions & Sculpture Directions* to explore on WashedAshore.org. Then, invite students to share their group findings with the class.

CREATING THE SCULPTURE

- Explain to the class that together, you’ll plan, design and create a collaborative piece of recycled plastics art to raise awareness of marine plastic pollution. With permission from school administration, organize a recycled plastics drive. Think tank groups make posters that explain the plastics drive — purpose, date, locations, types of plastics.
- Consider the amount of plastic material you’ve collected and decide the scope of your project as a class, including size, which Antarctic species you’ll represent, and how many. Follow the directions in the “Plastic Sculpture Steps” section of *Activity Sheet: Think Tank Questions & Sculpture Directions*.
- Find a place to display the finished product in an area approved by school administration. Consider creating plastic recycling and penguin conservation pledge cards for people who view the sculpture to sign. Then, collect and display the cards on a bulletin board near the sculpture.

WRAP UP

Discuss the art the class created and what they learned through the design and problem-solving process. Ask students how the artwork/exhibit might raise awareness of plastic pollution in your community and how public art works promote conservation. Lastly, be sure to properly dispose of and recycle any plastics not used for the sculpture.

KEEP GOING

View the TED-Ed Student Talk “[Cleaning our Oceans: A Big Plan for a Big Problem](#)” Prepare your own inspirational story about how and why to deal with ocean pollution.

Basic Sculpture Concepts

open sculpture: parts of the mass reach into surrounding space

closed sculpture: seen as a solid form overall

freestanding: does not need a base to stand

base: what a sculpture is mounted on

subtractive: carving out a shape

public art: works of art designed for public display

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.”

- Margaret Mead

Activity
GRADES
4-6

THINK TANK QUESTIONS & SCULPTURE DIRECTIONS

NAME _____

DATE _____

Directions: Each think tank has one question to explore on WashedAshore.org. Be prepared to share your answers.

Think Tank Questions

1. How can art educate the world about plastic pollution in oceans and waterways?
2. Why is it important that people understand the impact of plastic pollution?
3. What are other activities people can do to help clean up plastic pollution?
4. The United States is one of the biggest users of plastic water bottles in the world. What can the country do to reduce the waste from plastic water bottles?
5. Why is conservation and preservation of the marine environment important?



NOTES:



Sculpture Photos Credit: WashedAshore.

PLASTIC SCULPTURE STEPS

1. Collect, wash and sort plastics by color or size.
2. Determine the scope of the project.
3. Analyze pictures of Adélie penguins.
4. Sketch 3D perspectives of penguin poses and select one to guide the assembly of the sculpture.
5. Each group will create a portion of the collaborative sculpture and then all the pieces will be assembled to create the finished sculpture.
6. Sign up to create one of the following: head, upper body, lower body, right or left wing, feet and base.
7. Work collaboratively to determine the best way to secure the pieces and attain the appropriate shape and size for the body part.
8. Use glue dots to hold pieces together for shaping and glue guns and wire to secure pieces together.
9. View the sculpture up close and from a distance to analyze shape and progress at the end of each session.
10. Assemble all pieces into the larger sculpture and display in a predetermined place.
11. Attach a sign explaining the purpose of the sculpture.

Disney
nature
PENGUINS