

LESSON PLANS

Simple ■ Student Friendly ■ Accessible

OBJECTIVES

Students will understand the following:

- Polar bears inhabit areas near the North Pole, where the climate is cold.
- Polar bears exhibit physical adaptive characteristics that keep them warm in their cold habitat.
- Guard hairs, the hollow outer hairs in a bear's coat, absorb the radiation of the sun.
- Blubber acts as an insulator.
- A polar bear's black skin absorbs more heat than light-colored skin can absorb.

PROCEDURES

- 1 Review what a polar bear looks like and where its habitat is located. (You may need to clarify that polar bears live near the North Pole; there are no polar bears in areas surrounding the South Pole.) Students should be aware that polar bears inhabit a generally cold climate.
- 2 Encourage students to speculate about how polar bears stay warm in their cold habitat.
- 3 Most students will agree that a polar bear's thick fur keeps the animal warm. Let them know that polar bears exhibit additional physical adaptations for surviving in a cold climate.
- 4 Tell the class that the outermost hairs on a polar bear's body are called guard hairs. Unlike the fur beneath, the guard hairs are hollow. They absorb radiation from the sun and store the heat inside.
- 5 Tell students that polar bears have blubber, or a thick layer of fat, beneath their skin. Challenge students to guess why blubber helps a polar bear stay warm. (The blubber acts as an effective insulator, preventing body heat from escaping.)
- 6 Tell students that, while polar bears have white fur, their skin is black. Challenge students to guess why black skin is an advantage to an animal living in a cold climate. (Dark colors absorb more heat from the sun than do light colors.)
- 7 Divide the class into groups, and challenge each to design a model that would demonstrate the effectiveness of two or three adaptive characteristics you have discussed.
- 8 Each group should list the materials needed for each model, sketch and label their prototypes, and write a procedure that outlines the steps of the demonstrations.
- 9 Have each group complete and present at least one of its demonstrations.

POLAR BEARS



GRADES 9-12

QUICK FACTS

Kingdom: Animalia
 Phylum: Chordata
 Subphylum: Vertebrata
 Taxon Group*: Tetrapods (Animals)
 Taxon Group*: Amniotes
 Class: Mammalia
 Subclass: Theria
 Infraclass: Eutheria
 Order: Carnivora
 Suborder: Caniformia
 Family: Ursidae
 Species: *Ursus maritimus*

* Term not part of ITIS taxonomy

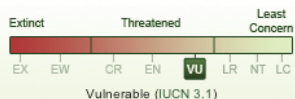
Common Name: Polar bear

Other Common Names: English: Sea bear; French: L'ours blanc, l'ours polaire; German: Eisbär; Spanish: Oso polar.

Taxonomy:

Ursus maritimus Phipps, 1774, Norway.

Conservation Status



Use *Grzimek's Animal Life* to enhance the lesson

Intuitive, in-depth and easy to access, *Grzimek's Animal Life* supports lesson plans and enhances classroom assignments.

STEP 1

Review a polar bear's appearance and habitat

Interactive Habitat Maps

The "Where They Live" tool points students to animal habitats. Students can view the map as a globe or projection.

Outstanding Images

When the lesson calls for images of animals there is no other place to look than *Grzimek's*. We have **pictures** of thousands of animals, including polar bears.

STEPS 2-5

Discuss how polar bears stay warm

All About Blubber

Check out articles from national magazines to learn how much blubber a polar bear needs to survive in the winter.

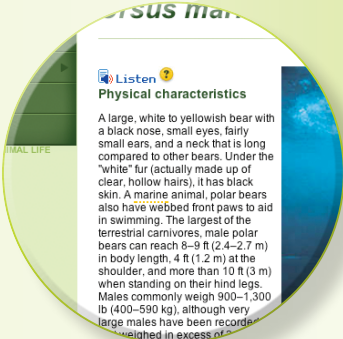
- "Dissecting the blob: beached and bloated, it still tells a tale"
Jennifer Steinberg Holland,
National Geographic, Nov. 2003
- "Bears on thin ice"
Newsweek, Jan 8, 2007

STEP 6

Consider why a polar bear's black skin is an advantage

Physical Characteristics

Trustworthy information is easy to identify and access. With species facts sourced from the classic reference *Grzimek's Animal Life Encyclopedia*, you can direct students to *Grzimek's Animal Life* with confidence.



STEP 7

Create and present a model

Generating Ideas for the Model

Grzimek's can help students brainstorm ideas for the adaptation model by browsing the through other animals that have the **same characteristic** or searching the periodical content for examples of how animals have adapted over time.



STEPS 8-9

Evaluate and apply research

