POLAR TREC
Learning Resources

Details

Completion Time: About 1 period
Permission: Download, Share, and Remix

Antarctic Food Web

Overview
One of the first things to understand about the Antarctic ecosystem is what kinds of animals actually live there. This lesson provides a basic introduction to important Antarctic wildlife and how they interact with each other.

Objectives
1. Students will be able to create a food web of the Antarctic ecosystem.
2. Students will be able to identify the difference between carnivores and herbivores (consumers) and plants & phytoplankton (producers).
3. Students will be able to identify how any two organisms in the ecosystem could affect each other.

Lesson Preparation
Make copies of Antarctic wildlife cards for each group in your classroom.

Procedure
1. Ask students if they are carnivores or herbivores. Then ask students if they are consumers or producers. Most students will know the answer to the former but not the latter; explain each definition. Producers make their own food (usually using energy from the sun). Consumers eat producers (getting their energy from the producer).
2. Make a list on the front board of all the animals that students know live in Antarctica. (If students mention polar bears, remind them that they live in the North Pole, but not the South Pole).
3. Tell students they'll be exploring some other wildlife that exists in Antarctica. At this point, pass out materials to each group and have students quickly cut out their Antarctic wildlife cards.
4. Ask them to find two animals, one that eats another and to put them on their poster sheet and then draw an

Materials

- Set of Antarctic wildlife cards for each group
- Big sheet of paper for each group
- Scissors & glue
- Markers

arrow between them. Tell them to keep reading the cards and adding more organisms on to their paper. If a consumer eats more than one type of organism, there should be an arrow to each organism it consumes.
5. Wander through the classroom giving feedback to student groups.
6. Using a green marker, have students circle all the producers on their poster. Using a red marker, have students circle all the consumers.
7. Ask two different students to pick two different organisms (e.g. leopard seal and krill). Once they've done that, model an explanation of how those two different organisms might interact or affect each other. A good prompting question is "How would this organism (leopard seal) be affected if all of these other organisms (krill) died?" To help students see this more clearly, you can remove the krill from the picture and prompt them to discuss what other organisms would eat in the absence of the krill.
8. Have students randomly pick a few different organism pairs and write about how each organism affects the other on a sheet of paper.

Extension
Although this activity is written simply, these cards can be used in a variety of ways to introduce Antarctic organisms and their relationships with each other. Ask students how scientists know about these relationships and how these relationships could be studied. (Observing directly, studying stomach contents of dead animals, studying fecal matter, taking samples of carbon and nitrogen isotopes). These cards and food webs can also be used for discussing energy flow, and the carbon-oxygen cycle.

Resources
http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/gifted_and_talented/eco_book.pdf

Assessment
Assessment should happen as the teacher is walking around and in addition their organism pair writing should be collected at the end of class.

Credits
Amber Lancaster, Nadine Orejola (pictures), Adapted from Eureka and Ecosystems, Project CONN-CEPT

Learning Resources

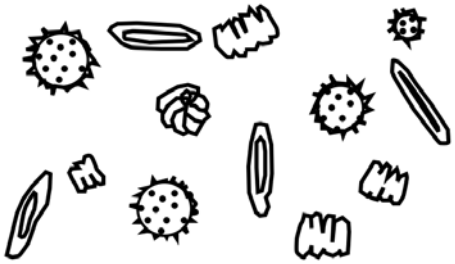
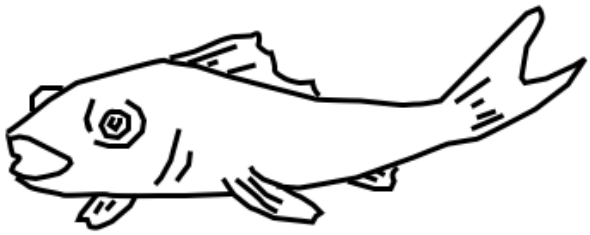
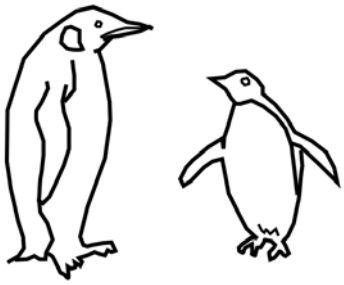
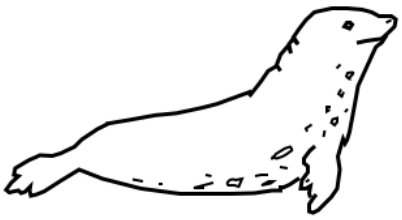
National Science Education Standards (NSES)

Content Standards, Grades 5-8

Content Standard C: Life Science
d. Populations and ecosystems

Content Standards, Grades 9-12

Content Standard C: Life Science
d. Interdependence of organisms

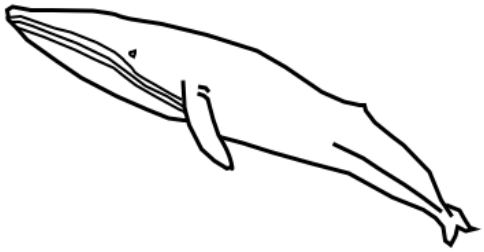
 **PLANKTON**	 **KRILL**
 **FISH**	 **SQUID**
 **PENGUINS**	 **SEA BIRDS**
 **CRABEATER SEAL**	 **LEOPARD SEALS**

• Small (1cm to 15cm) red, shrimp-like creatures. • Looks like a crayfish without the front claws. • Provides food source for most of the other life forms. • Sometimes found in groups called swarms.	• Phytoplankton are speck-sized plants that are the major producers of the Antarctic • Zooplankton are microscopic animals, who along with the phytoplankton, make up a group of animals called plankton • Algae are very small plants found free-floating in the Antarctic waters • Plankton and algae are the base for the Antarctic food pyramid.
• There are many species (30-40) found in Antarctic waters. • Sometimes found in groups called shoals. • Is a food source for many larger animals. • Feeds on small fish and krill.	• There are about 100 species of fish found in the waters off Antarctica. • Very small fish may feed on the plankton and algae. • Most feed on krill and on each other.
• A large variety of birds visit the Antarctic region. • The Skua is a scavenger, feeding on eggs and young penguins and wounded or dead animals. • Many of the seabirds also feed on fish, squid, and krill.	• A flightless bird, "wings" adapted to be effective paddles for swimming. • Only large animals to inhabit the Antarctic mainland during winter (Emperor). • Have no predators on land. • Feed on fish and krill. • Is preyed on by leopard seals and killer whales. • Six types are found in Antarctica including the Emperor and Adelie.
• Is preyed upon by the killer whale. • Feeds on penguins, young crabeater seals, fish, squid, krill.	• Is preyed upon by killer whales, and when young, leopard seals. • Feeds on krill not crabs; has unusual teeth which are effective strainers. • Is the most abundant seal in the world.

KILLER WHALE

WEDDELL SEAL

SPERM WHALE



BLUE WHALE

LIFE ON LAND

• It feeds mostly on cod and silverfish. • Is preyed upon by killer whales and when young, leopard seals. • Is at times killed by man because it's found close to many of the Antarctic bases (killed to feed sled dogs). • Very deep diver, can stay submerged for up to an hour and a half.	• Top carnivore of the Antarctic • Travels in packs or family groups called pods. • Feeds on seals, penguins, fish, and occasionally other whales
• Largest animal found on earth. • Feeds on krill which it strains through its baleen. • Only natural predator is the killer whale. • Man has killed so many that it has brought them close to extinction	• Is a toothed whale. • Feeds on fish and squid. • Is occasionally preyed upon by the killer whale. • Deep diver, using echolocation to find prey in dark deep waters.
	• The only plant life found on Antarctica is sparse growth of mosses, lichen, fungi, and fresh-water algae. • Plant life survives on exposed patches of ground during the summer. • Bacteria and fungi are the main decomposers. • The largest group of animals is insects (mites and ticks).