ACTIVITY 5

PLANTS AND ANIMALS OF THE ARCTIC

Summary

Students create an arctic food web to understand the feeding connections and social relationships between tundra plants and animals.

Grade Level:

3-4; K-2; 5-8

Time:

one to three class periods.

Subjects:

science, creative arts, physical education

Skills:

analysis, comparison, construction, critical thinking

Learning Objectives:

Students will be able to:

- ✔ Explain the relationships between several arctic plants and animals.
- ✔ Identify a number of arctic plants and animals and their role in arctic food chains.

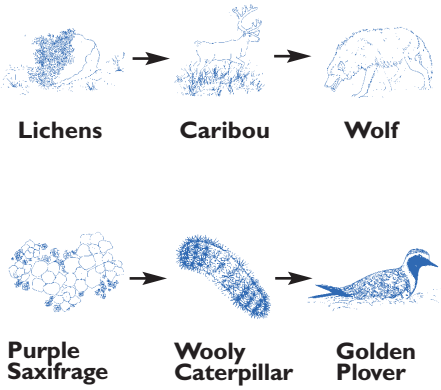
Materials:

- ✔ One rag, bandana or cloth for each student, using three different colors for the class,
- ✔ Arctic Species cards (included)

Background

The arctic is home to plants and animals adapted to take advantage of its unique climate. On the following pages are examples of plants (producers), **herbivores** (**primary consumers**, plant-eaters), **omnivores** (eat both plant and animal matter), and **carnivores** (primarily meat-eaters). Your students will use these relationships to create their own food chains and food webs in this activity. Your class can learn more about the plants and animals of the arctic ecosystem by reading Arctic Summer by Downs Matthews (1993; New York: Simon & Schuster).

Sample food chains:



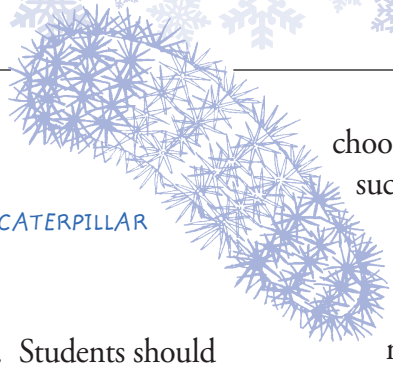
Procedure

1. With your class, review or introduce the terms **producer**, **herbivore**, **omnivore** and **carnivore**. Explain that they will begin by examining some arctic food chains to learn about the feeding connections of tundra species, and will ultimately construct an arctic food web. Ask your students, *What is the main source of energy for all living things? (the sun) How does the energy get from one organism to another? (through food chains)* Discuss the role of decomposers in recycling nutrients.

2. To practice making food chains, organize your students into small groups. To practice, distribute the Arctic Species cards for them to line up

in logical feeding order, making one or more food chains. Ask students to look at each other's food chains and identify any problems. *How does each food chain start? Where does it end? How does it recycle?* Help students identify links in the chain they may have forgotten, such as starting with the sun or including decomposers, etc.

3. Collect the square cards then re-distribute an assortment of them to the class, one for each student. Distribute only one sun. Students should familiarize themselves with their card, then attach it to the front of their shirt using masking tape. To illustrate the concept of the food web, move the students to an open area. Have students circulate around the area and join hands with other students forming natural arctic food chains. Students should join fingers when it is necessary to accommodate more than one other student onto that end of their chain. In the case of an herbivore, for example, one hand should be dedicated to producers, and the other hand dedicated to omnivores.



WOOLY CATERPILLAR

4. Once they have completed their food web, have them stop and look around. They will likely be well interconnected. Ask, *How are you all connected? Why is it important that there are so many links? How would removing one species from the web impact other species? What would happen if we removed caribou from the web?* Before letting go of one another, choose only one individual, such as a caribou or a mosquito, and explain to the students that there has been an environmental disaster, causing the extinction of the caribou. With all other students remaining in place, remove the caribou from the group. Next, ask any students who were connected to the caribou and relying on it for food, to leave the group. Explain that if the caribou (for example) are no longer eating the lichen, lichen populations could grow out of control. When this happens, habitat occupied by other plant species may be overtaken. To demonstrate, remove a "moss" or "grass" from the web. Any student who is relying on moss for its food source should then leave the group. Continue in this fashion for as long as is reasonable, then have the students evaluate the web that remains. This exercise should serve to illustrate the complexities of the relationships between organisms in any ecosystem.

PURPLE SAXIFRAGE

Modifications for Younger Students (K-2)

Have students pick Arctic Species cards from a bag or box and color them in. Then select student volunteers to hold up their card. Ask them, *What does this animal eat? What eats it?* Assist students to identify another student with a card that is predator or prey of their animal. Have them stand next to this new animal. After several rounds of moving students around to stand next to predators and prey, point out to students that all these animals and plants are interconnected. *What does that mean? What would happen if one disappeared?*

Modifications for Older Students (5-8)

✔ Have students work in small groups to make their own arctic species cards and food webs based on the plants and animals provided, or they can research several arctic species, determine what they eat and what eats them, and then create their own cards and food webs.

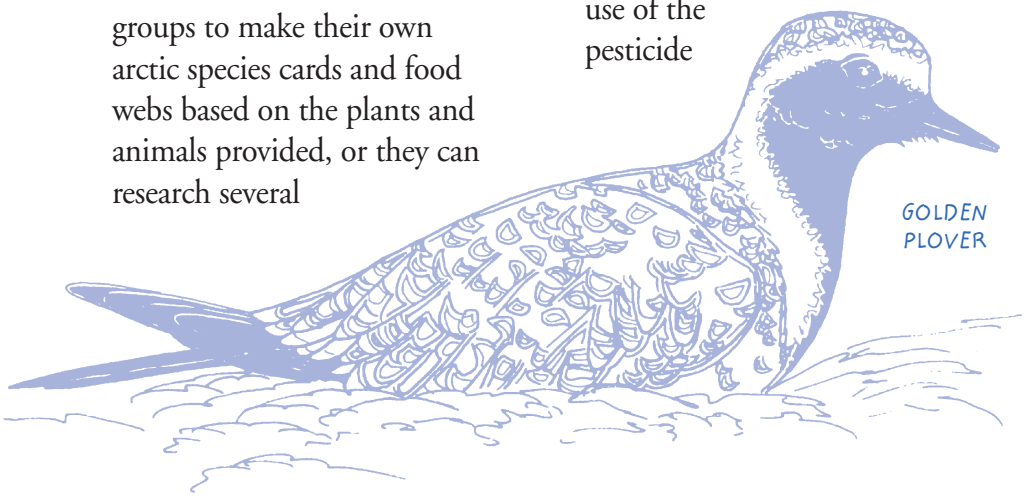
Extensions

✔ Research real-life situations in which a pollutant moved through a food chain or web. Discuss with the students the fact that pollutants are sometimes initially taken in by one organism, but may have serious consequences to an organism further along the chain. Examples would be the use of the pesticide DDT, or fallout from the Chernobyl nuclear power plant accident. *How did this pollutant affect the food web?*

✔ *Which arctic species can also be found in your region?* Have students research and report their findings to the class, including the food webs to which they belong.

Assessment

✔ Have students research the predator/prey interactions of their chosen arctic species (from Activity 2) and create a food web highlighting that species. Alternatively, have students create a food web for local species or a species found on their schoolyard. Students can then create a predator-prey mini-drama, and present their creation to the class.



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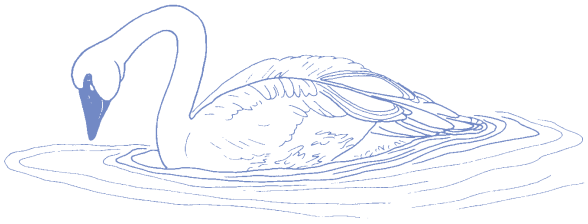
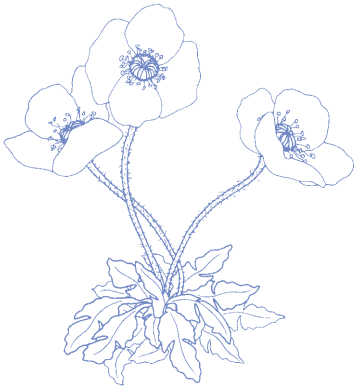
ARCTIC SPECIES CARDS

Plankton

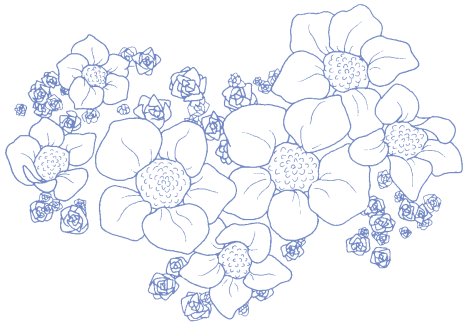


Tundra Swan

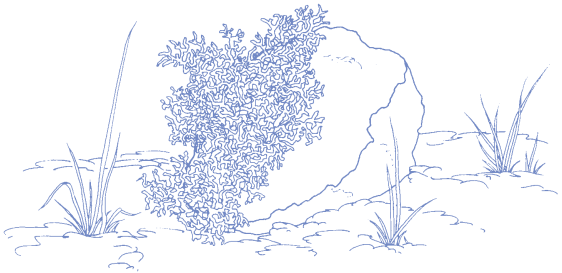


Arctic poppy

Blueberry Bush



Purple Saxifrage



Lichen

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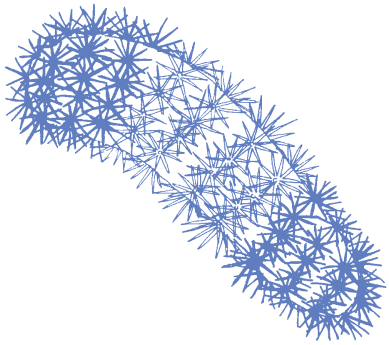
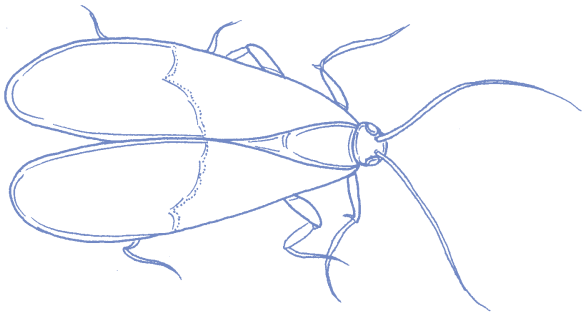


Wooly Bear Caterpillar

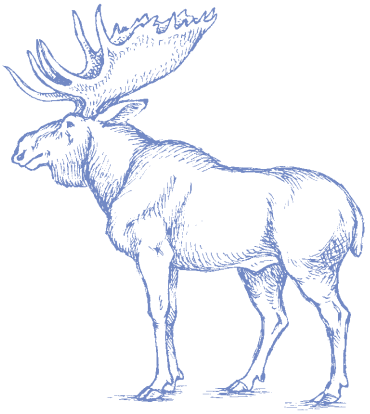
Lemming



Lichen Moth

Caribou

Musk Oxen



Moose

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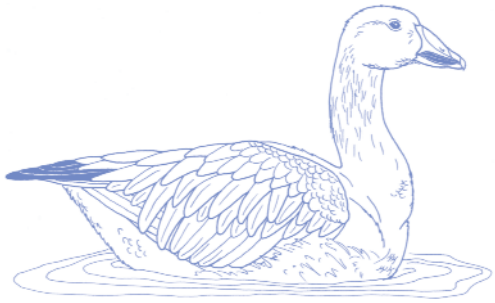
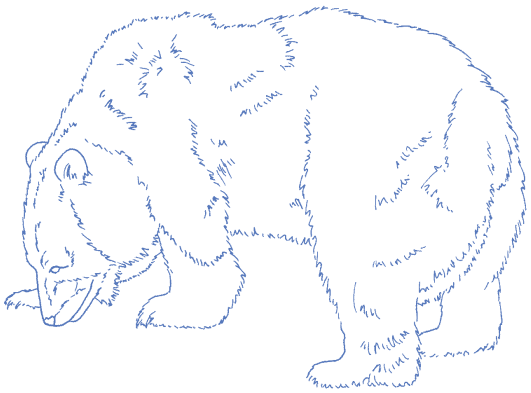


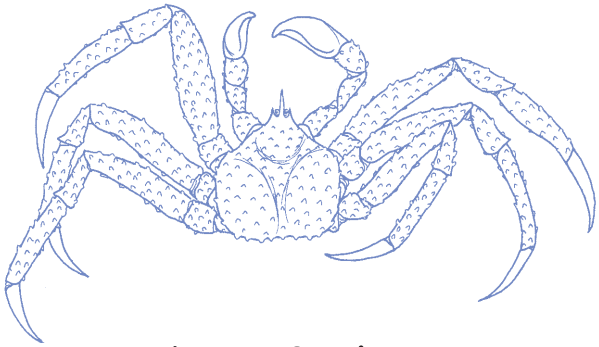
Snow Goose



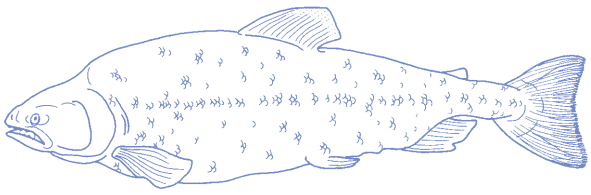
Grizzly Bear

Snowshoe Hare

Ptarmigan



King Crab



Salmon

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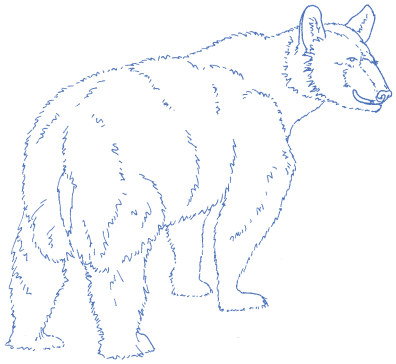
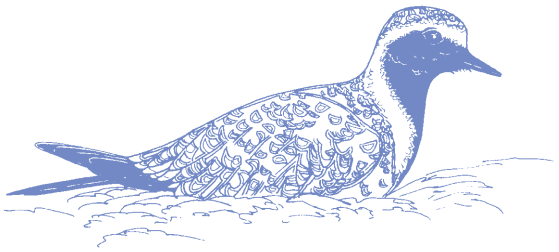
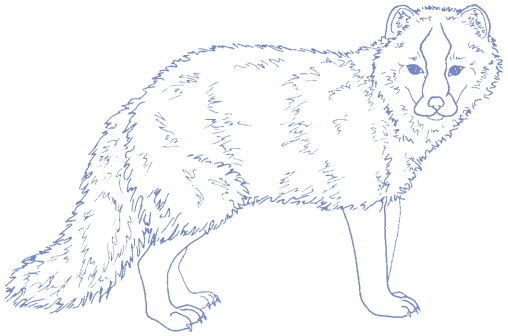


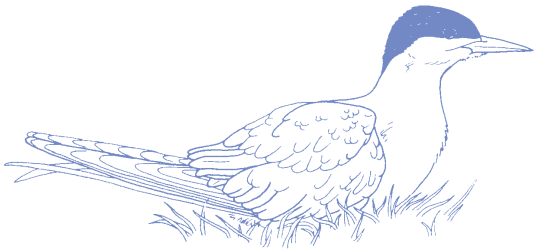
Black Bear



Golden Plover

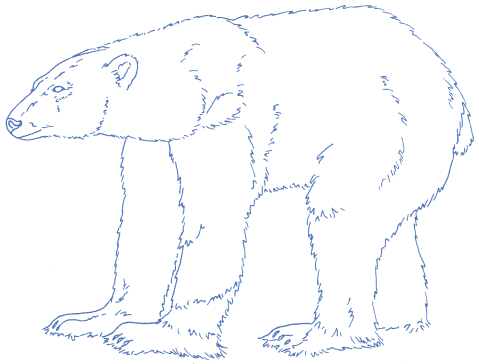


Arctic Fox



Arctic Tern

Walrus



Polar Bear

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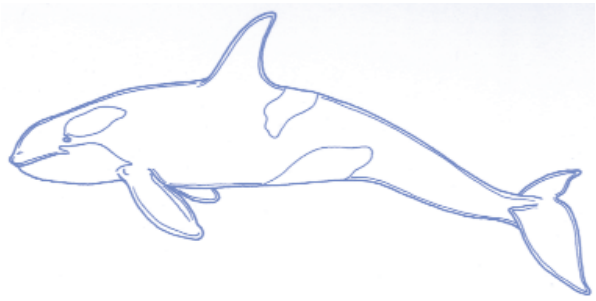
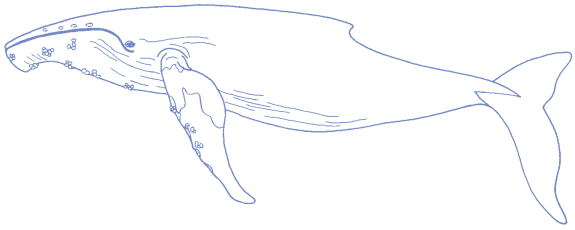
Wolf

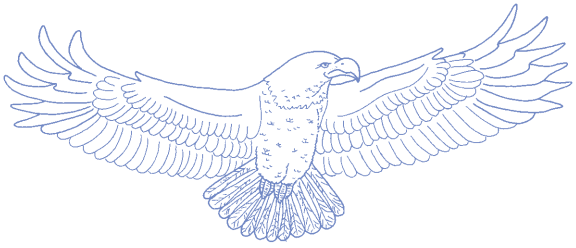


Orca

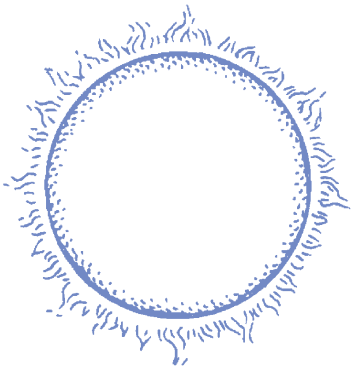
Snowy Owl



Humpback Whale



Eagle



Sun