



EDUCATIONAL SUPPLEMENT #3

VENTURE ARCTIC PREDATORS

Learning Objectives:

For students to gain an understanding of the different predators that inhabit the Arctic, including the following: their prey, their methods of hunting and various adaptations that allow them to survive.

This Packet Contains:

- Teaching Materials
- Activities and Worksheets
- Supplemental Media and Resource Sheet
- Visual Aids (Separate Download)

Teaching Materials: A detailed look into various Arctic animals, their adaptations and ways of life, intended to supplement the PowerPoint visual aid and provide background information for the instructor.

Visual Aid: A PowerPoint presentation that compliments the teaching materials with maps, photographs, charts, fun facts and other visual aids.

Activities and Worksheets:

- Predator Word Search
- Predator Food Chain Activity
- Predator Profile: Polar Bear fill-in Worksheet
- In-Game Lab
- Arctic Predator Quiz



TEACHING MATERIALS

Venture Arctic Predators

The following pages provide information about five of the predators featured in Venture Arctic, focusing on their anatomy and adaptations as well as how and what animals they prey on.

Specialized Predators

Predators in the Arctic have many obstacles to overcome. While food is scarce in the Arctic, predators need a lot of food to sustain themselves through freezing temperatures. In order to survive in the harsh climate they must have many physical adaptations providing warmth and camouflage as well as specialized hunting and dietary adaptations.

- The Arctic environment poses many unique challenges to predators, including:
 - Limited vegetation / scarcity of food
 - Limited shelter and hiding places
 - Ever changing terrain (ice melting, heavy storms)
 - Drastic seasonal changes (including long periods of light and darkness)
 - Extreme temperatures

Polar Bears- Ursus maritimus

- Polar Bears are only found around the Arctic Ocean and adjacent seas.
- Their closest relatives are the brown bears, though polar bears have been very adapted to life in the Arctic.
- Their average lifespan in the wild is 25-30 years.

Anatomy and Adaptations

- Polar bears are the largest land predator (twice the size of a lion). Males are 7.9 to 9.8 feet in length and weigh 900- 1600 pounds.
- The largest male polar bear to be documented weighed 2,210 pounds!
- Females are approximately half the size of males, measuring between 5.9 -7.9 feet and weighing 330-550 pounds.
- Polar bears have large and slightly webbed paws for good traction on ice and fast swimming
- They have black skin to absorb heat from the sun.
- They have a thick white under coat for warmth and camouflage.
- They have a translucent guard coat that is water repellent.

Hunting and Prey

- Polar bears are the most carnivorous bear, and eat mostly ringed and bearded seals.
- They rarely catch a seal in open water, so they rely heavily on their keen sense of smell and their “still-hunting” technique in order to catch their prey.
- Still-hunting: They stalk breathing holes, the edges of ice sheets, and cracks in surface ice for seals in need of air.
- Polar bears are specialized to require consumption of large amounts of fat only available from marine mammals.
- Polar bears will also consume dead whale carcasses and whales trapped at breathing holes.
- When the sea ice melts in the warm season, they live off reserves as well as some terrestrial animals including: caribou, muskoxen, birds, rodents and eggs.
- They will also eat plants including berries, roots and kelp though they cannot sustain a diet without marine mammals.
- They have no natural predators, though are currently classified as a vulnerable species due to melting trends in the Arctic sea ice.

Arctic Wolf- *Canis lupus arctos*

- The Arctic wolf is a subspecies of the gray wolf.
- They are only found in the Canadian Arctic and parts of Greenland.
- Their average lifespan in the wild is seven to ten years (compared to the 18+ years achieved by this species in captivity).

Anatomy and Adaptations

- Arctic wolves are shorter than their relatives, generally 3 -6 feet in length (including their tail) and bulkier, weighing 100-173 pounds.
- They also have smaller ears helping them maintain their body heat.
- They have a snow white coat for camouflage.
- Permafrost in the Arctic makes it so that they cannot dig dens; they instead use rock, caves or depressions in tundra soil.

Hunting and Prey

- Arctic wolves hunt in packs and mostly prey on Caribou and muskoxen.
- They also hunt moose, arctic hares, lemmings, seals and other small animals.
- Due to the scarcity of food and plant life in the Arctic, wolf packs roam areas exceeding 1000 square miles in order to find prey.
- Packs will also follow migrating caribou during the winter to sustain themselves.
- They have a symbiotic relationship with ravens; ravens will direct wolves in the direction of prey in order to eat the carrion left by the pack.
- There is no threat to their survival, and human interference in their natural habitat is a rarity.

Wolverine- Gulo gulo

- Wolverines are relatives of weasels; they resemble a bear cub with a long tail.
- Their average lifespan in the wild is seven to twelve years.

Anatomy and Adaptations

- They are about the size of a medium-sized dog, usually 2-3 feet in length and 22-40 pounds.
- They have very powerful jaws, sharp claws and thick hide, but they are also very slow and have bad eyesight.
- They are quite possibly the strongest animal for their size.
- They have a specialized back molar that is sideways; it juts into their mouth allowing them to tear meat off prey or dead animals that have been frozen.
- They are brown in color with two pale yellow stripes down their backs.
- They have very large feet to help them walk in soft snow.

Hunting and Prey

- Wolverines have been known to kill prey as large as a moose, though they usually prey upon smaller animals such as hares and rodents.
- Though they are strong predators, they often feed on carrion left over by other large animals.
- They are known to climb trees and rocks to ambush prey from hiding.
- Wolverines have no natural predators, but are sometimes killed by other large predators in confrontations over territory or food.

Arctic Fox- Alopex lagopus

- The Arctic fox is a small fox only found in the Arctic.
- Their average lifespan in the wild is between three and six years.

Anatomy and Adaptations

- They range from 2.3- 3.6 feet in length and weigh 6.5- 17 pounds.
- Important adaptations include the following: thick fur, shortened ears, legs and muzzles, rounded body with low surface area and fur covered soles.
- The arctic fox's thick tail is used as a warm cover during the winter months.
- The arctic fox has a thick white winter coat which serves as effective camouflage as well as providing warmth in freezing arctic temperatures.
- The fox's summer coat which is gray- brown provides seasonal camouflage as well.

Hunting and Prey

- The fox's diet consists of mainly lemmings, other small arctic rodents, sea birds and occasionally ringed seals and carrion left over by other large predators.
- When food is scarce, the arctic fox is known to follow polar bears and eat their scraps.

- They have very few natural predators. Sometimes the young may be hunted by birds of prey.

Snowy Owl- *Nyctea scandiaca*

- The Snowy owl is a large owl, very closely related to the horned owl.
- It is typically found in the northern circumpolar region, but can be found in more southern latitudes when food is scarce.
- Their average lifespan in the wild is nine and a half years.

Anatomy and Adaptations

- A snowy owl is between 20 and 28 inches long, their wingspan is 4.2- 4.8 feet and their weight is between 3.5 to 6.5 pounds.
- Unlike other owls that are solely nocturnal, they are nocturnal and diurnal (awake during day and night). Their ability to hunt during the day is crucial to their survival in the Arctic as it is light for months at a time during the Arctic summer.
- They have thick plumage and heavily feathered feet for warmth.
- They are white with yellow eyes and a black beak.
- Young owls get whiter with age, especially the males who can be practically pure white when fully mature.
- Females are darker than males with more black scalloping.
- Because there are no trees in the High Arctic, the Snowy Owl nests on the ground, on top of a mound or boulder.

Hunting and Prey

- They hunt both during the day and at night.
- Their diet consists of primarily lemmings; they also eat other small rodents and occasionally other birds and arctic hares.
- An adult snowy owl may eat more than 1600 lemmings a year.
- They swallow their prey whole and regurgitate pellets of bone, teeth and fur 18-24 hours after feeding.



PREDATOR WORD SEARCH

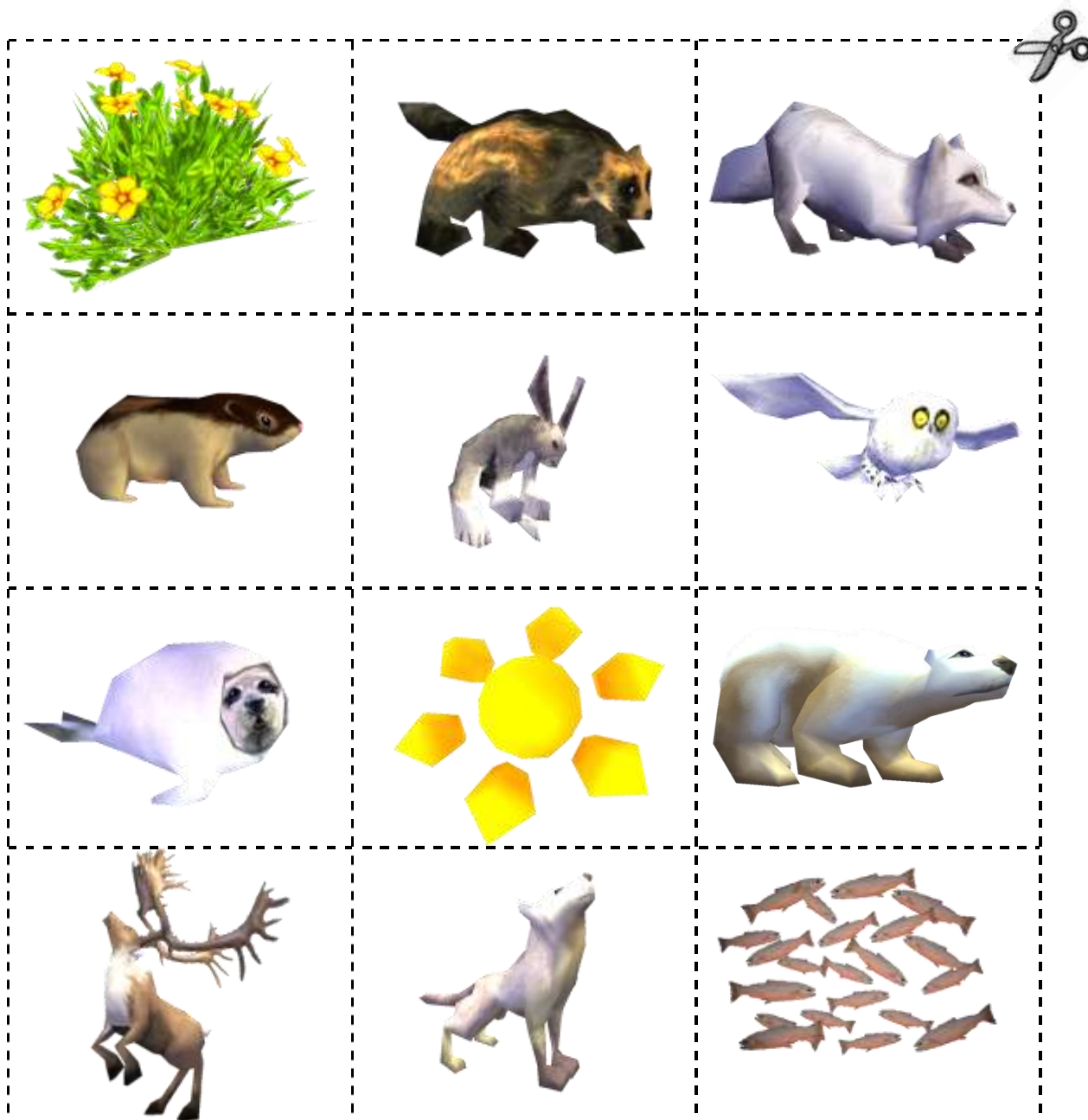
E R E W P A C K R
G A N O I R R A C
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WORD BANK

- Camouflage
- White
- Hunt
- Prey
- Polar Bear
- Snowy Owl
- Fox
- Wolf
- Wolverine
- Berries
- Roam
- Pack
- Carrion
- Ice

BONUS: Can you remember what carrion is?

PREDATOR FOOD WEB



Make sure your favorite Arctic Predators have enough to eat! Cut out the images above, and on a separate sheet of paper arrange them in your very own food web. Draw arrows to connect each animal with all of its food sources and glue them down when everything is in place.



PREDATOR PROFILE

POLAR BEAR

Scientific Name

Ursus maritimus

Closest Relative

Brown Bear

Size

7.25- 8 ft long

900-1600 Pounds

Lifespan

25- 30 years

They have a layer of guard hairs that are water _____.

Polar Bears have _____ skin to help them absorb heat from the sun.

The Polar Bear's favorite food is _____.

They have a thick, white undercoat that provides _____ and camouflage.



They also eat:

FUN FACT

Polar Bears are the largest land predator, twice the size of a lion or tiger!

When the sea ice melts polar bears have a difficult time getting enough _____.

Polar Bears have large, _____ feet that make him a fast _____ and give him good traction on ice.



IN-GAME LAB

Teachers Instructions:

The following lab is intended to teach students how to make scientific observations of animals in the wild by using Venture Arctic. While this lab may be done with the trial version of the game, many of the animals are only available in the full version. Educators discounts are available.

In Venture Arctic, more animals become available as the player achieves their goals. For this lab, however, the teacher may want to instantly unlock all of the environments and levels. In order to unlock all animals and environments, follow these instructions:

WARNING: Following these instructions will unlock everything but will erase any other user profiles you may have already created in the game.

Download this file: <http://www.pocketwatchgames.com/d/userProfiles.cs>

Place this file in the userData directory (see below) inside the Venture Arctic directory, replacing the existing file.

On a PC, open My Computer, go to the C: drive, click on Program Files, Venture Arctic (or Pocketwatch Games/Venture Arctic), then place the file in the userData directory.

On a Mac, Ctrl+Click on the Venture Arctic Application and click on "Show Package Contents". Place the file in the Content/Resources/userData directory.



IN-GAME LAB

Use this worksheet along with Venture Arctic to help you observe the predators you have learned about in action.

Pick two of your favorite predators, observe them while you play Venture Arctic and answer the following questions:

ANIMAL #1 _____

1. What do they hunt and/ or eat?

2. Do they interact with other members of their species? If so, how?

3. Do they compete with other species for resources? If so, who and what?

4. How do the different seasons seem to affect them?

What other interesting behaviors or patterns did you notice?

Ex: When a wolf finds food he howls to inform other members of his pack.

ANIMAL #2 _____

1. What do they hunt and/ or eat?

2. Do they interact with other members of their species? If so, how?

3. Do they compete with other species for resources? If so, who and what?

4. How do the different seasons seem to affect them?

What other interesting behaviors or patterns did you notice?



PREDATOR QUIZ

Multiple Choice

1. A Polar Bear's diet consists of _____.
 - a. Dead whale carcasses
 - b. Mostly seals
 - c. Roots and berries
 - d. All of the above
2. The Arctic Fox survives the harsh winter by _____.
 - a. Growing a thick, white, winter coat
 - b. Hibernating
 - c. Scavenging off the kills of larger predators
 - d. Both A and C are correct
3. Unlike most owls, the Snowy Owl _____.
 - a. Only hunts at night
 - b. Is light gray in color
 - c. Has feather covered feet
 - d. All of the above

True or False

1. Wolverines have been known to kill animals as large as a moose. T / F
2. Arctic predators eat a lot of plants in order to survive. T / F
3. Polar Bears are the largest land predators in the world. T / F

Fill in the Blank

1. Wolverines are much _____ than other animals their size.
2. Without sea _____ Polar Bears have a very difficult time hunting.
3. Unlike other wolves, the Arctic Wolf's coat is _____, providing the wolf camouflage in the Arctic.



**SUPPLEMENTAL MEDIA
& RESOURCES**

Fun extras for the classroom:

- This video clip shows a male Snowy Owl in flight, catching prey and returning to a nest where a female and her chicks await the meal.
<http://www.youtube.com/watch?v=zGcUbAtI2gg>
- The BBC News website provides the first video ever captured of Arctic Wolves hunting water fowl. There are also other segments capturing a variety of Arctic Wolves and their behaviors.
<http://news.bbc.co.uk/2/hi/science/nature/7213731.stm>