

Animal Adaptations Discovery Circus

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Target Student Population: 2nd grade animal adaptations lesson, living systems unit

Title: Camouflage

Directions:

- 1) The first four pictures are crickets called katydids. Can you find the katydid in each picture?
- 2) Examine each picture and make observations.
- 3) Use the pictures to answer the questions below.

Think of your best answer to these questions:

- 1) Look at the pictures of the katydids. What did the katydids try to look like? How did they do it? Why?
- 2) What do all the pictures have in common?
- 3) Can you think of other people or animals that use camouflage?

People and animals have used camouflage for a very long time. What do you think will happen if they did not use camouflage?

Title: Camouflage

Topic: How people and animals use camouflage

Grade Level: 2nd

Standards: VA SOL 2.5 The student will investigate and understand that living things are part of a system. Key concepts include
a) living organisms are interdependent with their living and nonliving surroundings

Materials:

Army uniforms

Photographs of katydids, available from:

<http://boingboing.net/2008/12/05/dying-leaf-katydid-p.html>

<http://jimmccormac.blogspot.com/2010/07/sounds-of-night.html>

<http://seeded.wordpress.com/2007/09/>

<http://www.timesunion.com/living/article/Savor-the-sounds-of-cicadas-and-katydid-654943.php>

Photographs of soldiers, available from:

<http://www.nuspel.org/rem4.html>

http://www.ghilliesuitsource.com/suit_ultralight_gs.html

Photographs of tanks, available from:

<http://science.howstuffworks.com/m1-tank.htm/printable>

http://commons.wikimedia.org/wiki/File:M901_TOW_missile_vehicle_%281985%29.JPG

Discussion Questions:

How is camouflage different from mimicry?

How do you think katydids were able to look like green leaves?

Where do you think people got the idea to use camouflage?

Can you think of other ways that people have used camouflage?

What is the purpose of camouflage?

Source:

Baptiste, P., Daniel, L., Hackett, R., Moyer, R., Stryker, P., & Vasquez, J. (2002). *Science*. New York City: Macmillan/McGraw-Hill.

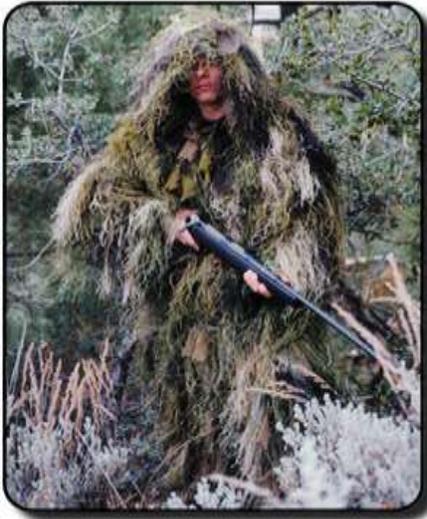
Notes:

The word “camouflage” comes from the French word *camoufler*, which means “to disguise.” Camouflage is a type of adaptation that helps an organism to survive. Camouflage allows an organism to blend in with its environment and helps to protect it from being attacked or eaten by another organism. Organisms can camouflage themselves by having body colors or shapes that match their surroundings. Humans have used camouflage to hide and to protect soldiers and equipment. Hunters have also used camouflage to hide from animals they hunt.

CAMOUFLAGE



CAMOUFLAGE



Animal Adaptations Discovery Circus, Student Card

Activity #2

Title: Mimicry

Directions:

- 1) Examine each picture and make observations.
- 2) Use the pictures to answer the questions below.

Think of your best answer to these questions:

- 1) What did the metalmark moth try to look like? Why?
- 2) What did the owl butterfly try to look like? Why?
- 3) What did the moth caterpillar try to look like? Why?
- 4) What did the scarlet king snake try to look like? Why?
- 5) What did all these pictures have in common?

Title: Mimicry

Topic: How animals use mimicry

Grade Level: 2nd

Standards: VA SOL 2.5 The student will investigate and understand that living things are part of a system. Key concepts include

- a) living organisms are interdependent with their living and nonliving surroundings

Materials:

Photographs of eastern coral snake and scarlet king snake available from:

<http://falkenblog.blogspot.com/2010/07/batesian-mimicry-explanation-of.html>

Photograph of owl butterfly, available from:

<http://www.livewild.org/CostaRica/Pics/a6024.jpg>

Photographs of moth caterpillar and metalmark moth, available from:

<http://sciencera.com/biology/zoology/camouflage-and-mimicry-the-art-of-disguise/>

Discussion Questions:

How is mimicry different from camouflage?

What did each organism do to try to look like another organism?

What is the purpose of mimicry?

What would happen if organisms did not know mimicry?

Source:

Baptiste, P., Daniel, L., Hackett, R., Moyer, R., Stryker, P, & Vasquez, J. (2002). *Science*. New York City: Macmillan/McGraw-Hill.

Notes:

Mimicry is a type of adaptation that helps an organism to survive. Mimicry enables an organism to look like another organism and helps to protect it from being attacked or eaten by another organism. An organism that tries to look like a predator (through mimicry) is less likely to be attacked by other predators and is more likely to survive. Organisms can mimicry other organisms by altering their body colors or shapes.

MIMICRY



Metalmark moth



Owl butterfly



Moth caterpillar

(Conant 1958)



**Eastern Coral Snake
(venomous)**

**Scarlet King Snake
(non-venomous)**

Title: Insulation from Polar Temperatures

Directions:

- 1) Place your left hand in the ice water in the cooler and keep it there for 30 seconds. Think about how cold the water feels.
- 2) Place your right hand in the blubber glove and adjust the rubber band cuff so it fits snugly. Now put this gloved hand into the ice water in the cooler. Think about how your hand feels inside the glove.
- 3) With your right hand still in the water, return your bare left hand to the ice water in the cooler. Compare any differences you feel.

Think of your best answer to these questions:

- 1) What difference in temperature did you feel between your two hands?
- 2) How can you explain this difference?
- 3) How might this experiment explain how polar bears adapt to the Arctic environment?
- 4) What other polar animals have this same adaptation?

Look at these photographs of polar bears. What other adaptations help the polar bear survive the extreme Arctic conditions?

Photos displayed on computer from:

<http://animals.nationalgeographic.com/animals/photos/polar-bears1>

http://www.nasa.gov/vision/earth/environment/polar_bears.html

Title: Insulation from Polar Temperatures

Topic: Insulating properties of blubber

Grade Level: 2nd

Standard: VA SOL 2.5 The student will investigate and understand that living things are part of a system. Key concepts include a) living organisms are interdependent with their living and nonliving surroundings

Materials:

- cooler filled with ice and ice water
- shortening (Crisco or equivalent)
- two medium zip lock bags
- thick rubber band

Directions:

- Fill a ziplock bag about half full with shortening to represent insulating fat or blubber.
- Turn the second ziplock bag inside out and place inside bag containing the shortening.
- Zip the two bags together. The second bag is inside out and will zip into the outside bag.
- Use hand to distribute the shortening evenly in between the bags. A hand placed in the bag should not be visible through the bags and should be surrounded by shortening.
- Put the rubber band where the two bags zip to serve as elastic to secure the bags and shortening like a glove.

Sources:

<http://www.learnnc.org/lp/pages/2964>

<http://teachers.net/lessons/posts/4318.html>

<http://www.raft.net/ideas/Blubber%20Gloves.pdf>

http://www.ngo.grida.no/wwfap/whalewatching/whale_species.shtml

Note:

Students might believe that insulation “keeps out the cold”. However, energy and heat flow from warmer to cooler areas and therefore, insulation actually keeps the heat in.

Discussion Questions:

- How would temperature increases affect an animal adapted for insulation against low polar temperatures?
- What other materials provide insulation against the cold? Consider various types of insulation used by people and in homes.
- What other adaptations help the polar animals survive the extreme Arctic conditions?
 - Walrus?
 - Penguins?
 - Whales?
 - Polar Bears?

Title: Map of Polar Bear Populations

Directions:

- 1) Look at the different maps of where polar bears live.
- 2) Look at the globe.

Using the globe and the different maps, think of your best answer to these questions:

- 1) In what countries do polar bears live?
- 2) Polar bears live near what seas and oceans?
- 3) How are these maps different from each other?
- 4) How are these maps similar to one another?
- 5) How are these maps the same as the globe?

Using the world map provided, color where polar bears live.

Title: Map of Polar Bear Populations

Topic: Comparing features of maps and globes

Grade Level: 2nd

Standard: VA SOL 2.6 The student will demonstrate map skills by constructing simple maps, using title, map legend, and compass rose.

Materials:

- multiple maps of polar bear population and range
- classroom globe

Sources:

Polar Bear Maps:

<http://news.bbc.co.uk/2/hi/science/nature/4447790.stm>

<http://www.polarbearsinternational.org/polar-bears/maps-and-trackers/population-and-distribution>

http://www.ifaw.org/ifaw_latin_america/save_animals/bears/polar_bear.php

<http://express.howstuffworks.com/exp-polar-bear1.htm>

Outline of World Map:

<http://www.outline-world-map.com/map-images-original/outline-blank-transparent-world-map-b1b.png>

Discussion Questions:

- Do all maps label the same places?
- Do all maps use the same coloring?
- What is missing from specific maps?
- Which map is the easiest to use?
- Which map gives you the most useful information?
- Why and when would people choose to use a map rather than a globe?

Title: Seasonal Changes

Directions:

- 1) Place three cards at the top of each table. Discuss the meaning of each word with your group.
- 2) Look at the map and globe of the earth. Usually there is less seasonal change near the middle, or the equator. As you travel north or south toward the poles, seasonal changes become greater. Find the place where you live.
- 3) Oceans and other large bodies of water affect land temperature. Water does not change in temperature as rapidly as land does. Locate the nearest ocean to where you live.
- 4) Study the pictures of animals. See how many pictures you can match with the three cards to show how these animals adapt to seasonal change.

Think of your best answer to these questions:

- 5) How far are you from the equator and from the North Pole or South Pole
- 6) If you live near an ocean, changes in seasons may not be as great. Does a large body of water affect your climate? How?
- 7) With your group, discuss your reasons for grouping the pictures the way you did. Why do you think some animals migrate, while others stay and adapt to seasonal change?

Do people migrate? Do they migrate for the same or different reasons from animals?

Title: Seasonal Changes

Topic: How do seasons affect animal adaptations?

Grade Level: 2nd

Standards: VA SOL 2.5: The student will investigate and understand that living things are part of a system. Key concepts include

- a) living organisms are interdependent with their living and nonliving surroundings

Materials:

Map of the world from classroom

Globe from classroom,

Cards labeled “Hibernate”, “Migrate”, “Adapt”

Photographs available from: www.google.com/images

Discussion Questions:

What is the difference between hibernate, migrate, and adapt?

Why would some animals hibernate while other migrate and adapt?

What animals do you notice hibernating, migrating, or adapting?

Do people migrate? Do they migrate for different reasons than animals? What are the reasons people migrate?

Source:

Animal adaptations resources. (n.d.). Retrieved from

<http://www.teachervision.fen.com/ecological-adaptation/animals/6989.html>

Notes:

Animals have different ways of adapting to seasonal change, mostly due to the availability of food. Some hibernate in a completely resting stage. Some animals, such as bears, increase their rest and reduce their level of activity but do not completely hibernate.

Many animals remain active in the same area year-round and utilize whatever food is available.

In past times caribou, buffalo, and reindeer existed in great numbers. AS these animals migrated with seasonal change, men who depended on them for their existence (food and clothing) also migrated.

<http://www.songbirdgarden.com/store/info/infoprint.asp?documentid=216>

Hibernate Migrate Adapt





Title: Seasons Around the World

Directions:

- 1) Look at the picture of the Arctic tern, a famous world traveler. Many baby terns are hatched in Greenland in late June or early July. Find Greenland on the globe and place a piece of masking tape here.
- 2) Within a few weeks the terns are ready to begin their migration. Use the globe, a 50-cm piece of string, and a piece of masking tape to mark their journey.
- 3) After leaving Greenland, they fly to the west coast of Europe. Stretch your string and tape it from Greenland to the west coast of France, Spain, or Portugal.
- 4) From this point they fly down the west coast of Africa. Stretch your string and tape it to at least two points near the top and bottom of Africa's west coast.
- 5) From a point near the southwest part of Africa they make a long journey over the south Atlantic and the Antarctic Ocean to the fringed ice of Antarctica. Stretch your string across the oceans to Antarctica and tape it there. Because the seasons are opposite in the Northern and Southern Hemispheres of our earth, it is summer in the south when it is winter in the north.
- 6) Terns spend several months in Antarctica, during which they may circle the entire continent. Make a circle with your string around Antarctica.
- 7) Look at the string path from Greenland to Antarctica on your globe. This marks half the distance a tern flies each year. By May, winter is beginning in Antarctica and the tern returns to Greenland over approximately the same route. Mark or cut the string where the tern's journey ends in Antarctica. Remove the string from the globe. Measure the length of the string and cut another piece twice as long. This represents the total distance a tern may travel each year.
- 8) Wrap the longer piece of string around the globe at the equator. Then wrap it around the globe crossing both the North Pole and the South Pole. Can you see why we call terns world travelers?

Think of your best answer to these questions:

- 9) Other animals in the pictures from activity #5 travel shorter distances, and for different reasons. Some birds in the United States and Europe migrate east and west rather than north and south. Why do you think this is?
- 10) What different types of animals and climates do you think the tern encounters along its world traveling?
- 11) Can you think of another animal that might also be a world traveler?
- 12) Why would the tern start off in Greenland ending in Antarctica and then back to Greenland? Do those two countries have something in common?
- 13) Did the tern seem to fly in the same direction throughout its migration, or did it fly in different directions?

What do you think would happen to the tern if it did not migrate? Is there another place similar to Antarctica and Greenland the tern could migrate to?

Title: Seasons Around the World

Topic: Migration among the continents

Grade Level: 2nd

Standards: Science: VA SOL 2.5 The student will investigate and understand that living things are part of a system. Key concepts include

- a) living organisms are interdependent with their living and nonliving surroundings; and
- b) habitats change over time due to many influences.

Social Studies: VA SOL 2.5 The student will develop map skills by

- a) locating the equator, the seven continents, and the five oceans on maps and globes;

Materials:

Picture of Arctic tern (<http://www.google.com/images>)

Map and globe from classroom

String

Masking tape

Scissors

Discussion Questions:

Why did the tern start of in Greenland and then migrate to Antarctica, what to those two continents have in common?

How many continents does the tern visit during his world traveling?

How many oceans does the tern cross during his world traveling?

About how far does the tern travel from beginning to end?

Source:

Animal adaptations resources. (n.d.). Retrieved from

<http://www.teachervision.fen.com/ecological-adaptation/animals/6989.html>

Notes:

Some birds in Europe, North America, and other parts of the world migrate east and west rather than north and south because they “summer” inland and “winter” near the coast where it is warmer. Ornithologists are not certain how birds navigate or “home”. Theories include the use of stars, the earth’s magnetism, landmarks, and combinations of these. Their ability to find a specific location on the earth is amazing, and they do it even in great numbers without the help of traffic controllers!

