



# Grade 3 Cougar Connections Study Guide



### **Before the trip:**

In order to have your students receive the maximum enjoyment and learning from their experience here, we recommend some pre-visit classroom preparation. Included in this packet is a test that should be administered before and after your field trip, background information about the topics to be studied, as well as lessons and activities linking our Cougar Connections program with language arts, science, mathematics and art.

- ❑ Before the trip, administer the **Pre-test/Post Test**.
- ❑ Students must be divided into groups of 10 – 20 (see class list for exact number of groups according to your student total). Please use the **class list template** to separate your students into groups. This template can be found on our teacher webpage, <http://encenter.org/teacher-resources/>. Make a note of any medical conditions, physical challenges or language difficulties we should be aware of. Bring the class list on the day of your field trip.
- ❑ 1-2 adult chaperones are required per student group (i.e. 2 adults for the Coyotes, 2 adults for the Hawks, etc.) Admission is waived for required chaperones. Additional chaperones must pay the field trip fee.
- ❑ Download the **nametag template** on our teacher webpage. Create a nametag for each child, corresponding to the group they are in, and pin it on before they arrive for the hike. Please do not string the nametags around their necks.
- ❑ Remind students to wear comfortable clothes, closed-toed shoes, a hat, sunscreen, and layered clothing in cool weather. Remember — it is often cooler down here near the ocean!
- ❑ Children should eat a healthy breakfast on the day of the trip. They should **NOT** bring water bottles, food or backpacks.
- ❑ Directions to the ENC, information about green fundraising and other materials helpful to teachers are available on our special teacher webpage, <http://encenter.org/teacher-resources/>

### **When you get here:**

- ❑ There are two parking spots for busses in the parking lot. If you are carpooling, please inform us ahead of time, as space is very limited.
- ❑ When you arrive, please keep students on the bus. The Naturalists will board the bus and ask ALL adults to disembark for an “adult meeting” with our Lead Naturalist. A staff Naturalist will do a student introduction on the bus, and then unload the students according to groups.
- ❑ Each group of 10 – 20 students will accompany a staff Naturalist on a hike through the Center, where they will rotate among six activities. Activities at each station will last approximately 15 minutes.
- ❑ Restrooms are available only in emergency situations. Have students use the restroom before leaving school.
- ❑ Students on field trips may not consume food at the ENC, unless a student has a medical reason for eating.

### **After your field trip:**

- ❑ After the trip, administer the **Pre-test/Post Test** to gauge your students’ academic growth as a result of participating in our program. Send an email to [lori@encenter.org](mailto:lori@encenter.org) with your class’s average score for the pre-test AND post-test. After your program we will send you a link to an online **teacher survey**. Please take the time to complete the online survey. It will help us gauge the needs of your school, teachers and students.
- ❑ Download the **student survey** on our teacher webpage. Have your students fill it out soon after their visit. Our Naturalists enjoy receiving feedback from the students they teach, and the survey can help you gauge the effect the program had on your students!
- ❑ Please return student surveys to: Environmental Nature Center, attn: Education Dept., 1601 16<sup>th</sup> St., Newport Beach, CA 92663
- ❑ The ENC will send an invoice after your field trip for the total amount of the program. If the invoice should go somewhere besides to YOU, please contact us with the appropriate contact information.

### **If weather is a concern:**

In cases of severe weather, the ENC will call to cancel your program. If you are considering canceling, please call 949-335-8656 (cell) between 7:00 and 8:00AM.

## State Science Standards Covered

- 1a Students know energy comes from the Sun to Earth in the form of light.
- 1b Students know sources of stored energy take many forms, such as food, fuel, and batteries.
- 1c Students know machines and living things convert stored energy to motion and heat.
- 3a Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
- 3b Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
- 3c Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
- 3d Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
- 3e Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

## Environmental Principles and Concepts Covered in this Program:

- Explain that the growth, survival, and reproduction of plants and animals processes can be influenced by human activities.
- Identify how living things (including humans) can cause changes in the environments in which they live.
- Provide examples of changes to the environment caused by living things that are beneficial, detrimental or neutral in their effects on other organisms.
- Explain how changes to the environment, brought about by an organism, may harm that organism or other organisms.
- Provide examples of large-scale changes to ecosystems that result from human activities and natural events.
- Recognize that when the environment changes, some plants and animals will die or move to new locations because the natural system can no longer meet their needs.

## Objectives

1. Students will be able to define the term adaptation, and be able to provide at least three examples of adaptations for plants and animals.
2. Students will be able to describe at least three different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
3. Students will be able describe at least one way that humans have changed the environment, and name at least one locally endangered species, and one locally extinct species.
4. Students will be able to describe the path of energy from the Sun to the Earth, how energy is stored, and finally converted into sound, light, motion and heat.

## Vocabulary and concepts to review:

1. **Adaptation** - Physical or behavioral characteristics that help a plant or animal to survive.
2. **Adapt or die** - When the environment changes, some plants and animals adapt and survive, while others die or move to new locations.
3. **Ecosystem** – All the living and non-living things that interact in a particular area.
4. **Habitat** – An animal’s home, containing its requirements: food, water, shelter and space.
5. **Endangered** – a plant or animal in danger of becoming extinct.
6. **Extinct** – Animals and plants that once lived on Earth but have completely disappeared.
7. **Food chain** - an arrangement of the plants and animals in an ecosystem according to the order in which each uses the next as a food source.
8. **Energy** – the ability to do work. Energy travels from the Sun to the Earth, where it can be converted into sound, light, motion and heat.



Name: \_\_\_\_\_

**ENVIRONMENTAL NATURE CENTER****Third Grade Cougar Connections "Post Test"**

1. What is the scientific name for an animal's home? (Fill in the blank spaces.)  
\_\_\_\_\_
2. What four things do all animals need in their habitat to survive? (Circle one answer)
  - a. Food, Water, Shelter, Space
  - b. Sun, Carbon Dioxide, Soil, Redwood trees
  - c. Oxygen, Salt Water, Cotton, Corn
3. What is the word a scientist uses to describe "behaviors and characteristics that help animals to survive in their environment?" (Circle one answer)
  - a. Habitat
  - b. Adaptations
  - c. Extinction
  - d. Food Chain
4. Some animals that once lived on Earth have completely disappeared. (Circle one answer)
  - a. True
  - b. False
5. When there are NO MORE of a particular kind of plant or animal left, it is... (Circle one answer)
  - a. Endangered
  - b. Extinct
  - c. Threatened
  - d. Missing
6. Why are some plants and animals in danger of becoming extinct? (Circle all the right answers)
  - a. Their habitat is being destroyed
  - b. People are hunting too many of them
  - c. There is too much pollution in their habitat
  - d. Mountain Lions are destroying their habitat

7. When a Mountain Lion eats a coyote who eats a rabbit who eats some leaves, scientists call it a: (Circle one answer)
- Metamorphosis
  - Food Chain
  - Endangered
8. Where do plants get their energy? (Circle one answer)
- Mountain Lions
  - Sun
  - Salt
  - Rocks
9. Name one adaptation that helps mountain lions to survive. (Write in your answer)
- 
- 
10. Mountain Lions are a sign of a healthy ecosystem. (Circle one answer)
- YES
  - NO
11. Mountain lions in Orange County are threatened by... (Circle all the right answers)
- Roads
  - Housing developments
  - Forest fires
  - Tigers
12. Mountain lions are important because... (Circle one answer)
- They control the deer population and they are at the top of the food chain.
  - They turn sunlight into food.
  - They eat plants
13. Humans should... (Circle one answer)
- Be respectful of Mountain Lions
  - Attack any Mountain Lions they see
  - Pet any Mountain Lions they see



Name: \_\_\_\_\_

ENVIRONMENTAL NATURE CENTER

**Third Grade Cougar Connections "Post Test" Answer Key**

1. What is the scientific name for an animal's home? (Fill in the blank spaces.)  
H A B I T A T
2. What four things do all animals need in their habitat to survive? (Circle one answer)
  - a. **Food, Water, Shelter, Space**
  - b. Sun, Carbon Dioxide, Soil, Redwood trees
  - c. Oxygen, Salt Water, Cotton, Corn
3. What is the word a scientist uses to describe "behaviors and characteristics that help animals to survive in their environment?" (Circle one answer)
  - a. Habitat
  - b. **Adaptations**
  - c. Extinction
  - d. Food Chain
4. Some animals that once lived on Earth have completely disappeared. (Circle one answer)
  - a. **True**
  - b. False
5. When there are NO MORE of a particular kind of plant or animal left, it is... (Circle one answer)
  - a. Endangered
  - b. **Extinct**
  - c. Threatened
  - d. Missing
6. Why are some plants and animals in danger of becoming extinct? (Circle all the right answers)
  - a. **Their habitat is being destroyed**
  - b. **People are hunting too many of them**
  - c. **There is too much pollution in their habitat**
  - d. Mountain Lions are destroying their habitat

7. When a Mountain Lion eats a coyote who eats a rabbit who eats some leaves, scientists call it a: (Circle one answer)
- Metamorphosis
  - Food Chain**
  - Endangered
8. Where do plants get their energy? (Circle one answer)
- Mountain Lions
  - Sun**
  - Salt
  - Rocks
9. Name one adaptation that helps mountain lions to survive. (Write in your answer)  
**ACCEPT MANY ANSWERS**
10. Mountain Lions are a sign of a healthy ecosystem. (Circle one answer)
- YES**
  - NO
11. Mountain lions in Orange County are threatened by... (Circle all the right answers)
- Roads**
  - Housing developments**
  - Forest fires**
  - Tigers
12. Mountain lions are important because... (Circle one answer)
- They control the deer population and they are at the top of the food chain.**
  - They turn sunlight into food.
  - They eat plants
13. Humans should... (Circle one answer)
- Be respectful of Mountain Lions**
  - Attack any Mountain Lions they see
  - Pet any Mountain Lions they see

## Introduction:

Students travel through the Nature Center to learn about the adaptations and survival skills of California's plants and animals, while they participate in mountain lion-themed activities. This program dispels myths about this ecologically important animal while using it as a centralizing theme to teach the state science standards. Students learn why it is imperative to maintain the integrity of the **food web**, and use critical thinking to identify ways for this to be achieved. During a visit to the ENC's new "green" building, students view the solar panels to see how the sun provides energy to power our lights and computers. Student teams experiment with mini solar panels to power small robots in a solar race!

*Why mountain lions?* The mountain lion is the only top carnivore left in our local ecosystem. Top predators have very important regulatory roles in terms of the way they structure the community of smaller predators underneath them, controlling herbivores and smaller animals. They have cascading effects even on the vegetation. They're what we call a keystone species, a species whose very presence contributes to a diversity of life. Their extinction from Orange County would consequently lead to the extinction of other forms of life. If we don't maintain some connectivity of habitat in Orange County we will lose mountain lions from the Santa Ana Mountains. Using the mountain lion as a centralizing theme, students will learn why it is important to maintain the integrity of the food web, and use critical thinking to identify ways for this to be achieved.

## Spectacular Sun

Science Standards: 1a, 1b, 1c

The sun warms the land, air, and water. Heat is a form of energy that comes from the sun. (Energy is the ability to do work). Here at the ENC we use the sun to create energy, so we can turn on our lights, computers, etc.

Photovoltaic (PV) cells on our building turn the sun's energy into electricity. Today, solar energy provides only a tiny bit of the electricity we use. In the future, it could be a major source of energy. Scientists are looking for new ways to capture and use solar energy.

### Basic Vocab and Concepts:

- **Energy** – the ability to do work. Energy travels from the Sun to the Earth, where it can be converted into sound, light, motion and heat.

**FOR TEACHERS TO KNOW:** PV cells are made of two pieces of silicon, the main ingredient in sand. Each piece of silicon has a different chemical added. When radiant energy hits the PV cell, the layers of silicon work together to change the radiant energy into electricity.

**Recommended Books to Read:** The following books would be appropriate to share with children, to help them learn more about the sun, solar energy and energy conservation.

- Energy and Our Future by Oxenhorn, Joseph M.
- Planet Patrol: A Kids' Action Guide to Earth Care by Lorbiecki, Marybeth
- Super Science Experiments: Amazing Energy Experiments by Pearce, Q. L.
- Lu and the Earth Bug Crew: Zap and the Energy Spikes by Sabori, Derek

### Suggested Classroom Activity: Build a Solar Oven

Adapted from: <http://www.hometrainingtools.com/build-a-solar-oven-project/a/1237/>

### Materials:

Cardboard box

Box knife or scissors

Aluminum foil

Clear tape

Plastic wrap (a heavy-duty or freezer zip lock bag will also work)

Black construction paper  
Ruler, or wooden spoon  
Apples, butter, sugar cinnamon, bowls

**Purpose:**

Students will learn that the energy from the sun can even be used to heat up the food that we eat!

**Class Discussion:**

Sun is the main source of energy for our planet. Plants use the energy from the sun to photosynthesize and grow. We eat plants to get our energy. We also eat animals that eat plants. Today, we are going to make a special oven that uses the energy from the sun to heat up yummy treats!

**Procedure:**

- Before your students arrive, use a box knife or sharp scissors to cut a flap in the lid of the box. Cut along three sides, leaving about an inch between the sides of the flap and the edges of the lid. Fold this flap out so that it stands up when the box lid is closed.
- Split your students into teams and have them cover the inner side of the flap with aluminum foil so that it will reflect rays from the sun. To do this, tightly wrap foil around the flap, then tape it to the back, or outer side of the flap.
- Use clear plastic wrap to create an airtight window for sunlight to enter into the box. Do this by opening the box and taping a double layer of plastic wrap over the opening you made when you cut the flap in the lid. Leave about an inch of plastic overlap around the sides and tape each side down securely, sealing out air. If you use a plastic bag, cut out a square big enough to cover the opening, and tape one layer over the opening.
- Line the bottom of the box with black construction paper - black absorbs heat. The black surface is where your food will be set to cook.
- The best hours to set up your solar oven are when the sun is high overhead - from 11 am to 3 pm. Take it outside to a sunny spot and adjust the flap until the most sunlight possible is reflecting off the aluminum foil and onto the plastic-covered window. Use a ruler to prop the flap at the right angle. You may want to angle the entire box by using a rolled up towel.
- Mix apples, butter, cinnamon and sugar together in bowls and leave in the solar oven for an hour or so.
- To take food out of the oven, open up the lid of the box, and using oven mitts or potholders, lift the glass dish out of the oven.

**Wrap-up:**

The heat from the sun is trapped inside of your solar oven, and it starts getting very hot. How does it happen? Rays of light are coming to the earth at an angle. The foil reflects the ray, and bounces it directly into the opening of the box. Once it has gone through the plastic wrap, it heats up the air that is trapped inside. The black paper absorbs the heat at the bottom of the oven, and the newspaper make sure that the heat stays where it is, instead of escaping out the sides of the oven.

Your solar oven can reach about 200° F on a sunny day, and will take longer to heat things than a conventional oven. Although this method will take longer, it is very easy to use, and it is safe to leave alone while the energy from the sun cooks your food. Reposition your solar oven when needed, so that it faces direct sunlight. You should be checking periodically on your oven, to make sure it is in the sun.

## Space for Habitat

**Science Standards: 3a, 3b, 3c, 3d, 3e**

We call animals home its habitat. In a habitat, an animal needs food, water, shelter and space. Different animals need different habitats, including space. Why do animals need space? To move, breathe, run, find enough food, find a mate, feel safe. When an animal is unable to do these things, it cannot survive. If all of its habitat becomes unsuitable, entire species can become endangered or even extinct (like the dinosaurs). At the ENC, your students

will discover how much space different animals need to survive and hear a story about what happened when a mountain lion did not get enough.

### **Basic Vocab and Concepts:**

- **Habitat** – An animal’s home, containing its requirements: food, water, shelter and space.
- **Endangered** – a plant or animal in danger of becoming extinct.
- **Extinct** – Animals and plants that once lived on Earth but have completely disappeared.

### **Recommended Books to Read:**

Crinkleroots Guide To Knowing Animal Habitats Jim Arnosky

Will We Miss Them? Endangered Species (Nature's Treasures) by Alexandra Wright

### **Suggested Classroom Activity: Crowding Can Be Seedy (adapted from Population Connection)**

#### **Materials:**

Masking tape or yarn

Flashlight (the sun)

Spray bottle

#### **Purpose:**

Your students will learn that space is just as important as food, water and shelter when it comes to habitat.

#### **Procedure:**

- Mark a 5’X5’ shape on the ground.
- Turn one of your students into a seed and “plant” the seed inside the shape. Have them sit with their head tucked.
- Get the seed growing by spraying the student with a spray bottle and shining the “sun” on it and by singing this little song:  
“The Sun shines, the wind blows, the rain falls and the little seed grows!” The seed should begin to slowly grow until he or she becomes a mature plant.
- Plant several more seeds in the space and have them try to grow. Can they all feel the water? Do they all have sun on them? Is it easy or hard for them to grow?

#### **Wrap-up:**

Space is important, not just for animals. It is important for ALL living things to get what they need to survive.

What about humans? Do we need space? What is the minimum amount of space that you think you could live in?

## **Food Chain**

### **Science Standards: 1a, 1b, 1c, 3a, 3c**

A food chain is a transfer of energy from one organism to another as they are eaten. All of the energy on Earth comes from the sun. Plants use the sun to grow, animals eat those plants and other animals eat those animals. Cougars are at the top of the food chain because not much eats them. At the ENC, your students will play a game where they play animals in a food chain and discover what can happen if the ecosystem is unhealthy.

### **Basic Vocab and Concepts:**

- **Food chain** - an arrangement of the plants and animals in an ecosystem according to the order in which each uses the next as a food source.
- **Biomagnification** – the increase in concentration of a substance through a food chain. If a rabbit eats a poisoned leaf, it may not kill the rabbit, but the coyote who eats two poisoned rabbits (2 poisoned leaves) will feel the effects and the cougar who eats two poisoned coyotes (4 poisoned leaves) will have more poison than all of them.

### **Recommended Books to Read:**

Food Chain Frenzy (The Magic School Bus Chapter Book, No. 17) by John Speirs and Anne Capeci

Vulture View April Pulley Sayre

Pass The Energy, Please! by Barbara Shaw Mckinney

### **Suggested Classroom Activity: The Literal Food Chain**

#### **Materials:**

Strips of paper

Pens, pencils, crayons

Staplers or tape

#### **Purpose:**

Your students will create their own literal food chain, using as many animals as they can think of. They will better understand how food chains work.

#### **Procedure:**

- Before your students arrive, cut out many strips of paper for each student (2 or 3 inches by 11 inches). You can either print pictures of many different animals in several different ecosystems on these strips or you can have the students draw the animals themselves.
- Let each student choose an ecosystem that they would like to create their food chain for. Oceans, forests, deserts, arctic tundra, pond, etc.
- Lay out the strips of paper with animals on them, or let your students draw their own food chains, one animal per strip.
- For any ecosystem, start with a plant and end with a decomposer! Ex: Ocean: Phytoplankton, Zooplankton, clams, octopus, shark, marine worms (decomposer).
- Have students make rings out of the strips and staple them together in a chain to create a literal food chain!

#### **Wrap-up:**

Who can make the longest food chain? Where do humans fit into the food chain? We are usually at the top! Are there some animals in your chain that would eat more than one animal in your chain? A food chain is actually a simplified version of a food web. See if you can connect all the food chains in your class to make one giant connected food web. What happens if even one animal disappears from your web? Many other animals disappear as well!

## **Food, Water, Shelter and Space: Habitat**

State Standards: 3c, 3d

A habitat is another word for an animal's home. A habitat is made up of four things: food, water, shelter and space. If an animal does not get enough of these four things it cannot survive in its habitat. In populations of animal species, such as deer, there are natural fluctuations in population due to the amount of food, water, shelter and space available to each individual. Your students will play a game at the ENC to learn how deer populations change over time.

#### **Basic Vocab and Concepts:**

- **Adaptation** - Physical or behavioral characteristics that help a plant or animal to survive.
- **Adapt or die** - When the environment changes, some plants and animals adapt and survive, while others die or move to new locations.
- **Ecosystem** – All the living and non-living things that interact in a particular area.
- **Carrying Capacity:** The average number of a species that can exist in a particular area.

#### **Recommended Books to Read:**

Animal Habitats! (Williamson Little Hands Series) Judy Press (Author), Betsy Day

Habitats, Grades 1-3 (Science Works for Kids Series) Jo Ellen Moore (Author), Marilyn Evans

## **Suggested Classroom Activity: How Many Coyotes Can Live in the Woods? (adapted from Project Wild)**

### **Materials:**

Different colored pieces of construction paper to represent various habitat components

Marker

One envelope or container per student

Blindfold (optional)

Rope (optional)

Open space

### **Purpose:**

Students will learn that habitats can only hold so many of each species of animal. The animals are competing with each other for resources. The number of resources determines how many of each species can survive.

### **Procedure:**

- Before your students arrive, cut out your colored cards and assign them each a resource. The blue cards can be water, the yellow cards plants, the red cards meat. Write a letter to symbolize what each card means. W=water, P=plants, M=meat. On the P and M cards, also write a number. This represents the pounds of plants and meat that the coyotes consume when they pick up the card. The numbers should be between 5 and 20 pounds for plants and between 1 and 10 pounds for meat. Make about 5 cards less than you have students, ie: 25 yellow and 25 red if you have 30 students. Make 5-10 less water cards than you have students.
- Turn each student into a coyote and give each student an envelope or container and tell them that this is their den. In a wide, open space, have each student place their den in a spot that seems like it would be a good home. They cannot move their den once they have placed it.
- Have each student stand with one foot on their den. Scatter the cards in the middle, but DO NOT TELL your students what the letters and numbers mean. Tell them that they will be hunting for food and water in order to survive in their forest for one week. They cannot steal from other coyote's dens and they can only pick up one card at a time. Each time they pick up a card they must return it to their den.
- Give the students about a minute to collect the cards, until all the cards are gone. When they are finished, tell them what the cards mean.
- Each coyote must have a water card. If they did not get a water card, they were unable to survive. Have all of the students with no water sit down.
- Each coyote must have at least 15 pounds of plants. Have all the coyotes who do not have 15 pounds of plants sit down.
- Each coyote must have at least 7 pounds of meat. Have all the coyotes who do not have 7 pounds of meat sit down.
- How many coyotes got everything they needed in this forest? This is the number of coyotes that this forest can sustain.
- Play the game a couple more times. Tell them that a mall was built in the middle of the woods. Trees and plants were removed and streams were blocked. Remove several of the cards. Have your students predict how this will affect the amount of coyotes that the forest can hold. Blindfold one student and tell them that he or she was stung by bees. How are these going to affect his chances of survival. Tie one leg of two students together. This is a mother and baby coyote. The baby cannot collect any food and the mother must get twice the amount of food. How will this effect their survival?

### **Wrap-up**

Humans are not always the cause of population decline in species. It can be a natural and healthy thing. If there are too many coyotes, they will eat all the food and then there will be none left and most of them will starve. The food sources will replenish in the absence of coyotes and the surviving coyotes will have plenty of food. Their numbers will increase and they will eat all the food and then there will be none left and many of them will starve. The fluctuation happens over and over again over time.

# Adaptations

## State Standards: 3a, 3b

An adaptation is a behavior or characteristic that helps a plant or animal to survive. These are physical traits that an organism is born with or grows that help it stay alive in its environment. They can also be behavioral traits that are learned. At the ENC, your students will play a game of Jeopardy to learn about the many amazing adaptations of Cougars!

## Basic Vocab and Concepts:

- **Adaptation** - Physical or behavioral characteristics that help a plant or animal to survive.

## Recommended Books to Read:

Would You Survive?: Animal and Plant Adaptation John Townsend

Bigfoot and Adaptation (Monster Science) Terry Lee Collins (Author)

## Suggested Classroom Activity: Adaptations Survival Game

### Materials:

Carpet squares (or some other kind of place marker)

Animal adaptation body part cards

Disaster scenarios

Dice

### Purpose:

Students will learn that various features of animals (their adaptations) really can help them to survive real events in the wild.

### Class Discussion:

- Do all animals look the same? NO! That's because they live in different places and eat different things. Does a giraffe look like an octopus? NO!
- Where does a giraffe live? On the plains of Africa. It eats the leaves at the tops of the trees, so it has to have a long neck to get to them. Male giraffes also use their long necks to fight other giraffes. Does an octopus live on the plains? NO! So it does not need to have a long neck.
- Where does an octopus live? In the ocean. It has a soft slippery body to help it fit into very small holes to hide from predators. It has eight legs to help pry open clams and catch its food. Does a giraffe have to pry open clams? NO! So it does not need eight legs, covered in suckers.
- We call the physical characteristics that animals have to help them to survive, ADAPTATIONS.

### Procedure:

- Before your students arrive, lay out the carpet squares in a game board set-up (a circle or a square) and place a disaster scenario on every third or fourth square. Make up your own!
  - Forest Fire: Wings, gills, speed, sharp eyesight, sense of smell.
  - Freezing winter: warm fur.
  - Flood: Wings, gills, speed
  - Predator attack: wings, sharp teeth, speed, sharp eyesight, camouflage, sense of smell.
  - Famine (not much food): sharp teeth, sharp eyesight, speed, camouflage, sense of smell
  - Have to become nocturnal: warm fur, sharp eyesight, sense of smell
  - Drought: sharp eyesight, good sense of smell
- Split your students into teams (or they can do it individually). Allow each team (or student) to pick two adaptations for their team animal to have. They can even draw their animal if they would like. Make up your own!
  - Wings
  - Sharp teeth

- Gills
- Warm fur
- Speed
- Sharp eyesight
- Camouflage
- Good sense of smell
- Roll the dice and let each team take a turn. If they land on a disaster and they do not have the right adaptation, they move back one or two squares. If they do have the right one, they can move forward one or two.

**Wrap-up:**

Which adaptations were the most useful in our game? Do humans have any adaptations? YES! Talk about our thumbs and our big brains. How do these help us to survive? Have your students create an imaginary animal with whatever adaptations they want. Where does your animal live? What does it eat? What are its adaptations used for?

## Human Interference

State Standards: 3c, 3d

Humans being are a very unique species of animal. Because of our big brains, we do things a little differently than most other creatures on the planet. We have a complex spoken language, excellent use of tools, a firm grasp on modern medicine and we change our environment more than any other creature. When humans change the environment, it affects all the plants and animals in both negative and positive ways. At the ENC, your students will play a game to learn many of the ways that humans can both help and harm our cougar neighbors.

**Basic Vocab and Concepts:**

**Human Interference:** When humans change eco-systems and environments for the better or worse.

**Recommended Books to Read:**

50 Ways to Save the Earth Anne Jankeliowitch (Author), Philippe Bourseiller  
Protect Natural Habitats (Save the Planet) Claire Llewellyn

**Suggested Classroom Activity: Shrinking Habitat (From Project Wild)**

**Materials:**

Green and Blue construction paper  
 Classroom desks, tables and chairs or hula-hoops  
 Five or six large bed sheets or blankets

**Purpose:**

Students will discover the effects of human development on plants and animals, they will discover the importance of suitable habitat and will learn that habitat loss is one of the biggest problems facing wildlife today.

**Procedure:**

- Split your students into four teams: Herbivores, Carnivores, Vegetation, Land Developers. Make three times as many herbivores as carnivores, two times as many vegetations as carnivores and have the rest be land developers. Ex: 9 herbivores, 3 carnivores, 6 vegetation and 2 land developers.
- Establish a wide-open space that simulates the habitat before development. The land developers will stay off to the side for this part.
- Give each herbivore two desks or chairs to use as shelter, three pieces of green construction paper to use as food, one piece of blue construction paper to use as water and split up the vegetation students between the herbivores (some herbivores will not have a vegetation student)
- Give each carnivore one desk or chair, 3 herbivores and their land, one piece of blue construction paper.

- Have the herbivores arrange their habitat the way they want it, and then have the carnivores move in and get comfortable in their habitat. Optional: Have each student decide what kind of animal they are and role-play that animal.
- While the animals and vegetation are getting situated, have the land developers come up with a plan for the shopping mall they are going to be building in this wilderness. They can only build a shopping mall the size of three herbivore habitats (or one carnivore), using the blankets and sheets and tables or chairs available in that habitat.
- Give the developers 3-7 minutes to build their mall. They may remove the vegetation students, shelter (desks and chairs) and food and water papers, if they would like.
- Once the mall is completed, engage the students in a discussion about what happened. What took place? What were the consequences? Would or did any of the animals die? How? Could the developers have done anything differently, besides not building the mall at all? Could they have built several small malls instead? What impact would that have? Could they have moved the mall to a different area? Were there any positive consequences? What was real about this activity and what was fake? In real life, development can sometimes enhance an area for some kinds of wildlife and not for others. Think Palm Springs. People planted plants and brought in a lot of water and created a large desert oasis. However, the animals that already lived there did not need these things in the first place. But new animals appreciated the changes.

**Wrap-up:**

Play the game a second time, this time switching all the roles. When the wildlife become land developers, did it change the way the mall was built and the habitat affected? Ask your students to complete this sentence as a writing assignment: “If I were going to build a house for my family in a wilderness area, I would...”