Animal Adaptations
Pre and Post Visit Materials

Kenosha Public Museum
5500 1st Avenue
Kenosha, WI

Kenosha Public Museum

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Animal Adaptations

Animal Adaptations is an hour long Learning Lab experience that is designed for students in 2nd to 4th grades. Students will investigate animal adaptations through hands-on investigations comparing and contrasting real specimens.

Program Goals:

- Students will understand survival adaptations used by plants and animals.
- Students will be able to identify animal adaptations using real specimens.
- Students will work collaboratively to build critical thinking skills.
- Students will engage in workshop generated conversations with teachers, other classmates and the facilitator.

Learning Standards:

- NGSS
  - 2nd grade DCI
    - LS2: Independent Relationships in Ecosystems
    - LS2.D: Social interaction and group behaviors
  - 3rd grade
    - LS2.C: Ecosystem dynamics, functioning, and resilience
  - 4th grade
    - LS4.D Biodiversity and Humans
    - LS1.A Structure and Function
- CCC
  - Patterns
  - Cause and Effect
- S &EP
  - Analyzing and Interpreting Data
  - Constructing Explanations and Designing Solutions
  - Engaging in Argument from Evidence

WI Science Standards- Grade 4 Benchmarks

1.) A.4.1 When conducting science investigations, ask and answer questions that will help decide the general areas of science being addressed
2.) B.4.1 Use encyclopedias, source books, texts, computers, teachers, parents, other adults, journals, popular press, and various other sources, to help answer science-related questions and plan investigations
3.) C.4.1 Use the vocabulary of the unifying themes to ask questions about objects, organisms, and events being studied
4.) C.4.5 Use data they have collected to develop explanations and answer questions generated by investigations
5.) F.4.1 Discover how each organism meets its basic needs for water, nutrients, protection, and energy in order to survive
6.) F.4.2 Investigate how organisms, especially plants, respond to both internal cues (the need for water) and external cues (changes in the environment)
   - Constructing Explanations and Designing Solutions

This packet of information will help prep your students for this program and allow for a debrief back in the classroom. Please go over information with your students, prior to the visit.

Key Vocabulary

Adaptation: A characteristic that allows an animal to be better suited to its environment.

Biologist: A person who studies living things, like animals, and tries to understand the natural world and what lives in it.

Camouflage: A way of hiding something by covering or coloring that allows it to blend into its surroundings.

Carnivore: An organism that eats meat.

Herbivore: An organism that eats plants.

Omnivore: An organism that eats both plants and meat.

Predator: An organism that hunts and eats other animals.

Prey: An organism that is hunted and eaten.

Resources:

http://www.animalplanet.com/wild-animals/animal-adaptations/
Animal Planet, Top 10 Animal Adaptations

Kids National Geographic, Animals
http://kids.nationalgeographic.com/animals/

Pre Visit Activities

Ear Adaptation

Objective: Students will learn about animal adaptation by examining ears of different animals and making models of them.

Materials:

- Per student:
  - 2 pieces of construction paper
  - 2 small paper plates
  - 2 large paper plates
- For table:
  - Stapler or tape
  - Scissors
- For class
  - CD player or mp3 speaker

Set Up:

Prior to class, pull together photos of different animals that have different types of ears. Examples: rabbit, cat, mouse, elephant and bear.

What you need to know:

Adaptation is a characteristic that allows for an animal to be better suited in its environment. Ears are one way of adaptation. Often the larger the ear, the easier it is to hear, this is the case in animals like rabbits or mule deer. By increasing the size or changing the shape of the ear, the sense of hearing is elevated. This is extremely important for animals that are prey animals and need to hear if a predator is coming.

However, sometimes an ear could be for temperature control. Elephants use their big ears to cool down. White tailed deer have smaller ears to keep them insulated in the cold winters. Ear adaptations are just one adaptation that help animals survive.

Activity:

1.) Put up the photos of animals. Have students make observations about their different ears. Ask what animals hear better and why they think that?

2.) Have students close their eyes and play them music from the CD player or mp3 speaker. Ask them if it was loud or quiet?

3.) Have the students hold the small plate behind their ears, like a mouse. Once again turn on the music, and have your student listen with their eyes closed. Ask them if the music was louder or quieter with the paper plate ears.

4.) Have your students hold the big paper plates by their ears. Again, turn on the music and have students listen with their eyes closed. Ask if the music is louder or quieter this time.

5.) Have your students create two matching ears with the construction paper. They can be any size. Some recommendations are wrapping the construction paper in a cone shape, with one side rolled tighter than the other, or triangle shaped ears.

6.) Once students have their ears made, have them hold them up to their ears again. Once again play the music and have students listen to the music with their eyes closed. Ask them if it was louder or if it was quieter with their ears.

7.) Make a list on the board of what shapes seemed to be the loudest. Have students try to find common threads in those results.

What's Going on Here?

Different ears will help animals hear better. Our ears are good, but there are animals with better hearing then we have. By increasing the ear size, students should have been able to hear more.

Extensions:

- Have students create a scientific journal entry about an animal with the ears they created, and explain where it would live, what it would eat and how its ears would help them.
- Have students create a graph comparing the size of the ear and the effectiveness of the hearing.

Bird Beaks

Objective: Students will learn how different birds eat in their environment through hands-on investigations.

Materials:
Per table

- Skewer
- Straw
- Pliers
- Tweezers
- Slotted Spoon
- Rubber Bands
- Cheese
- Seeds or Beans
- Rice, Noodles, or Oats in Water
- Colored water in cup
- Small box with holes in it
- Trays or plates
- Pictures of a woodpecker, hummingbird, cardinal, robin, and duck.

Set Up:

- Cut small holes in box that will allow small pieces of cheese through. Put cheese in the box and set as a station
- Put seeds/beans and rubber bands on separate plates
- Place rice/oats in the water in a medium size bowl
- Add food coloring to water to create colored water in a plastic cup
- Lay the photos with the “beak” of each bird: Skewer is woodpecker, straw is hummingbird, pliers is cardinal, tweezers is robin and slotted spoon is duck.

What you need to know:

Birds eat different food in different environments. Birds have specialized beaks that help eat the food. Beak adaptations allow the birds to be successful in their environment. Without their beaks being able to eat available food in their environment, they would not be able to survive. The hummingbird’s beak worked similar to a straw to suck up the nectar. Robin’s beaks are similar to tweezers that are used to get worms out from the dirt. Their beaks need to be sharp and precise. Cardinals have beaks similar to pliers because they have to be able to crack into seeds. Woodpeckers beaks are sharp and pointed, like a skewer. To get their food, they borrow into wood with their beaks and eat insects. Lastly, ducks eat in the water, so their beaks need to be designed to allow water out of the beak while keeping the food in, similar to a slotted spoon.

Activity:

1.) Ask students to identify the birds on the table and where they live. Make a list on the board so that the students can see where the birds all live. Brainstorm what kind of food the birds eat.

2.) Have students take turns with the different beaks. Each beak is representing a different bird. With the beak, they should try to eat the appropriate food that the bird would eat. These are:

- Pliers are the cardinal that eats seeds
- The slotted spoon is the duck that eats water insects or algae (represented by rice/noodles/oats in the water)
- The skewer is the woodpecker that eats insects in a tree (represented by the cheese in a box)
- Tweezers are the robin that eats worms (represented by rubber band)
- The straw is the hummingbird that drinks nectar (represented by the colored water)

3.) Have students try to “eat” the food with the beaks. Can they pick up the food? Is it hard or easy?

- Hummingbird- Place the straw in the colored water, place finger over the top to have water back up into straw, pick up the straw to see how much nectar was collected.
- Cardinal- Try to crack open the seeds with the pliers.
- Robin- Try to pull the rubber bands off the plate.
- Duck- Using the slotted spoon, try to remove the oats/rice from the water.
- Woodpecker- Using the skewer, students will remove a piece of cheese from the box through the small openings.

4.) Once all students have had an opportunity to use all the beaks, gather then back together. Ask the students if a robin’s beak would be successful at getting food in the water. Why or why not? What about a duck’s beak with getting worms? Why or why not? Have students explain why different birds’ beaks would not work in other environments.

What is going on here?
Each beak is only successful in their own environment. Birds would not be able to survive without food, and their beaks have adapted to allow for them to be better suited for their environment.

Extensions:

- Have students create their own bird beaks.

Post Visit Activity

The Amazing Cricket

Objective: Students will demonstrate understanding of animal adaptation by completing a task.

Materials:
Each student
- Paper
- Pencil

Whole class
- A photo of a cricket

What you need to know:
Crickets are insects that live throughout the world, especially in grasslands and woods. They use several adaptations to survive. They try to camouflage into their environment by being a brown or green color. They also have large back legs to propel them away from predators.

Activity:

1.) Show students the photo of the cricket. Have them sketch the cricket. Ask students where crickets live and how their body helps them survive in that environment.

2.) Ask the student to think about if a cricket was living in the arctic, and what adaptations would be needed for the cricket to survive that environment. Have them draw a new picture of the cricket with adaptations to live in the arctic.

3.) Have students think about if a cricket lived on a mountain, and what adaptations the cricket would have to have to survive. Have the students draw a picture of what they think a cricket living in the mountains would look like.

4.) Have the students think of their own environment, it could be a circus or a tropical island or your own school. Have them draw a cricket that adapted to fit their environment.

5.) Have the students share out their images, why did they think the cricket could survive in these environments? Ask other students if they have input on if the cricket would survive or not.

Extensions:
- Have the students create a book about the cricket and its journey.