

Animal Adaptations Pre Visit Guide: 2nd to 9th Grade

Webbed feet, wings, camouflage, and quills are all unique features. We will learn how animals utilize them to live and thrive.

These resources will help you and your students prepare to make the most of your zoo experience!

In-Classroom Activities

Explain that an **adaptation** is a feature or behavior that helps an animal survive in its habitat. A habitat is the animal's home, and animals often have characteristics that match a specific type of natural environment.

Think: If you were to bring a fish out of the pond and into the classroom, would it be able to survive for very long? Why or why not? Similarly, would you be able to go underwater in the pond to live with the fish? Why or why not?

There are many types of adaptations. Explore a few of them with these activities:

BEAKS & TEETH

Dental Detectives: Animal skulls can tell us many things about creatures and how they once survived in their natural environment. The teeth in an animal skull can tell us whether the animal was a carnivore (meat-eater), herbivore (plant-eater), or an omnivore (meat- and plant-eater). Carnivores have large, long, and pointed canine teeth for piercing and holding prey, and cheek teeth (premolars and molars) that are sharp and pointed for cutting and tearing flesh. Herbivores have large, well-developed incisors (front teeth) for cutting, and cheek teeth that are large and wide with high, sharp, crowns for grinding and chewing plant material. Omnivores have a combination of carnivore and herbivore teeth characteristics. Using the skull print-out supplied, have students predict the diet of each animal and where it may have belonged in the food chain.

Animal connection: Even animals that eat the same kinds of foods may have different adaptations! Eagles prefer to eat fish, and have a hooked beak to rip and tear those fish apart. Pelicans also eat fish, but have a large pouch to scoop up their dinner in one fell swoop.

Dental Detectives Key: Herbivore: B (Beaver), D (Horse) Carnivore: A (Alligator), D (Jaguar), F (Snake) Omnivore: E (Monkey)

INSULATION

Beat the Freeze: Explain to the students that this activity will demonstrate how animals can retain body heat through the use of various insulating materials (i.e. feathers, fur, blubber). Prepare melted gelatin and pour it into small glass or plastic containers with lids (such as a baby food jar, film canister, or pill bottle)—these will act like an animal's body. Divide students into

groups, give each group a container and ask them not to open it. Explain that they can wrap their container with a material of their own choice: they can only take one type of item (felt, feathers, paper, etc.) to use as insulation, and they will use rubber bands to hold the material around their canisters. Ask the students to then place their containers on a tray and then put them in a freezer for 20 minutes. After 20 minutes, the containers will be brought out for the students to examine. They will then see whether or not their animal survived based on the type of insulating material they wrapped their animal in. If the gelatin hardens in the container, then the animal did not survive! Relate the experiment to overwintering strategies of animals (i.e. fur, sleeping together). With older students, discuss the principles of convection and conduction. (Pro-tip: Don't have a freezer? Use an ice bath instead!)

Animal connection: The animals of the Arctic and Antarctic circles spend their lives surviving subfreezing air temperatures and frigid water. Their secret is blubber, a thick layer of body fat that comprises up to 50% of some marine mammals. Fat keeps heat in and cold out!

FEET & MOVEMENT

Grip Like a Gecko: Blow up a few balloons, and demonstrate to the students how to rub the balloon on their hair and then stick the balloon to another surface. Explain that the balloon rubbing on hair creates static electricity, and makes it attracted (want to stick) to other surfaces. Try comparing the effectiveness of different materials for producing a static charge, having students test several different materials such as silk, wool, nylon, polyester, plastic, metal, etc. Use a stopwatch to compare the amount of time the static force lasts for each material used. You can also have students crush up different types of cereal to see which will 'move' towards the balloon with a static charge.

Animal connection: Scientists found that geckos use electrostatic forces in order to keep a firm grip when climbing on smooth walls and across ceilings. Each gecko toe has tiny hairs that branch out into hundreds of tiny endings. These create electrostatic attraction and support the gecko!

CAMOUFLAGE

Four Ways to Hide: Animals can use four different methods of camouflage to keep themselves safe. When an animal has coloration that helps it to blend in with its surrounding habitat, this is called *concealing coloration*. *Disruptive coloration* refers to spots, stripes, and other patterns that help to break up an animal's outline. Animals that blend in by looking like a different object, like a leaf or branch, use *disguise camouflage*. And those that copy other, more dangerous animals—such as those with venom or poison—are using *mimicry* to fool predators. Using the photos provided below, have students group each animal by the specific type of camouflage it is using.

Animal connection: Species of insects known as phasmids, or stick bugs, have green or brown elongated bodies with thin legs that imitate the branches of the plants they hide on. They also produce eggs that look like seeds, making them harder to identify by predators.

Four Ways to Hide Key: Concealing: Snowy Owl, Woodcock, Spider Disruptive: Tiger, Zebra, Fish, Okapi Disguise: Brimstone butterfly, Gecko Mimicry: Viceroy butterfly, Swallowtail caterpillar, Milk snake



Four Ways to Hide Print-out

Dental Detectives Print-out



On-line Activities

SWITCH ZOO

Build an Animal: Create a new animal with unique adaptations! https://switchzoo.com/newzoo/bear_habitat.html

Please DO feed the animals: Sort animals into the correct category based on their diet! https://switchzoo.com/do-feed/

Recommended Reading

A Warmer World: From Butterflies to Bears by Caroline Arnold

A Strange Place to Call Home by Marilyn Singer

When Lunch Fights Back by Rebecca L. Johnson

Discussion/Research Topics

How have some species changed over time to adapt to new environments?

What are some ways that animals adapt and survive in extreme conditions, such as sub freezing winter temperatures or flooding from excessive rain?

Are animals still adapting to our changing world?

Hint: Lizards in the Caribbean have developed longer toes to survive hurricane weather; Tawny owls are showing more brown than gray coloration in a warmer climate.

Student Worksheet (2nd to 4th Grade)

Color the animal so that it will blend in with its habitat!





Student Worksheet (5th to 8th Grade)

Choose one of the habitats below. Describe how YOU would adapt to survive in this new environment!

OCEAN	DESERT	ARCTIC
List your adaptations:		

Draw a portrait with your new characteristics:



Student Worksheet (9+ Grade)

Compare the structure and function of each animal's tail!

