

Amazing Adaptations – 5th – 8th grade

Teacher Resource Packet



Dear Teacher,

In this packet you will find suggested activities and resources related to the **Amazing Adaptations** program that you can use in your classroom, before and after your visit to The Children's Museum of Science and Technology. Concepts taught in the classroom will come to life during your visit as students experience fascinating exhibits, museum artifacts and living specimens. We look forward to sharing in the excitement of scientific learning with you and your students. Please keep in mind the following when preparing for your Museum Program:

Please keep in mind the following in preparing for your Children's Museum of Science and Technology Program:

- All students should wear nametags
- You will be given additional time to explore the rest of the museum and view a dome show in our planetarium.
- Please inform your museum educator of any special needs prior to the start of the program.

We hope you enjoy your program. If you have any questions or comments, please call the Museum at 518-235-2120.

Amazing Adaptations

Program Guide Description: Examine live animals to discover animal adaptations, both physical and behavioral and find out what makes it possible for animals to survive in different environments.

Grades: 5th, 6th, 7th, 8th

Program Time: 75 minutes

NYS Learning Standards Correlations:

Middle School Science / Living Environment 3.2 Describe factors responsible for competition within species and the significance of that competition (a-organisms may compete with one another for resources)

Middle School Science / Living Environment 5.1: Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium (a-body plans and internal structures)

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Program Goals:

- To introduce students to the concept that all animals have behavioral and physical adaptations that help them survive in their environments.
- To familiarize students with how animals' adaptations help them obtain food, move, and protect themselves.

Participant Objectives:

- Participants will be better able to describe the difference between behavioral and physical adaptations.
- Participants will be better able to discuss how animals' adaptations enable them to survive.

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I. Pre / Post Activities

A. Local Animal Adaptations:

Students will examine the animals in the local ecosystem. Students should brainstorm all of the animals that they see locally. When they have assembled a comprehensive list, have each student choose a particular animal and research its adaptations. Adaptations should be both behavioral and physical and should include how they survive, gather food, build shelter, and avoid predators. Reports can be shared orally and turned in as a written assignment.

B. Extreme Environment Adaptations

Imagine there are four different planets with diverse climates (See descriptions below). Split class into four teams. Each team is assigned a planet and every person has to come up with an animal that is well suited to their planet's environment. When designing the animal, they should consider the following:

- Size
- What does it eat?
- How will it catch / get food and water?
- How will it keep warm / cool?
- Where will it shelter?
- How will it protect / defend itself from attackers?

Planet One: This planet is dark and cold most of the time. It is very mountainous. It rains almost all day. Because of the wet, dark conditions, the only plants that grow well are small mosses and funguses. Animals on this planet include a type of mouse, a nocturnal hunting large cat, fish, and a variety of insects.

Planet Two: This planet is dry and hot. Most of the planet is flat. Water is found in underground streams but there is little water on the surface of the planet. Most of the planet's surface is covered in sand, although there are patches of dry grass. When plants can get their roots down into the water table, they grow into tall trees with leaves at the top but not along the trunk. Plants which are not connected to the water table are small and dry, but they are edible. Animals on this planet include insects, a species of birds which roost in the high trees, a sand-colored lizard and a type of rat.

Planet Three: This planet is tropical: wet and hot. Most of the planet is covered by rainforest. The planet is very flat. Water collects in large pools

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and lakes which have water in them all year 'round. A species of poisonous plant grows thickly on the ground. The spines of this plant are poisonous, and any animal which steps on one is sure to die. The vegetation is plentiful, and includes leaves, fruits and nuts. Animals include carnivorous snakes, varieties of insects, monkeys, fish and birds.

Planet Four: This planet has a moderate climate. It never gets very hot or very cold, but stays mild all year 'round. It rains for part of the year and the water forms pools and lakes which dry up towards the end of the year and then the planet is very dry. The planet is partly mountainous and partly flat. Vegetation includes tall trees with high leaves and fruit, and a smaller plant which bears nuts. However, these nuts are inside hard shells which need to be removed before the nut can be eaten. Animals include rats and mice which live underground, insects, birds that nest in the tall trees, slow moving mammals which also live in the trees and a species of carnivorous nocturnal wolf.

C. Fashion A Fish:

While at the Museum, observe fish in each of the Hudson River Tanks. On an investigation sheet, record information and drawings about coloration, movement, body shape, size, and behavior of different fish and discuss how adaptations might help the species survive. When you return to the classroom, have students use their observations and Fish Features Worksheet (see attached) to fashion a fish adapted to a particular habitat.

D. Human Adaptation:

Humans, as animals, have to adapt to their environment just like all other animals do. Have the students' brainstorm how they adapt in their climate.

1. Think about the climate where you live and compare it to the climate in other parts of the US. How about the rest of the world?
2. Talk about people who live in extreme environments and how they survive. What do they wear? How do they stay warm or cool?
3. Discuss how the people in our area have adapted to the changing of the seasons. Use clothing, accessories and home design as conversation starters.
4. Have the students choose one of the human adaptations and illustrate it, either by a drawing or a magazine picture.
5. Make a mural or collage entitled Human Adaptations

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II. Vocabulary

Adaptation: any body part, behavior, or physiological capability that increases an animal's ability to survive in its environment.

Arid: lacking sufficient water or rainfall, dry

Behavior: anything an animal does involving action and/or response to stimulation.

Biome: The world's major communities classified according to the predominant vegetation and characterized by adaptation of organisms to that particular environment.

Camouflage: coloration that blends in with the surrounding environment

Canines: Long pointed teeth found in meat-eating animals. Found in the front of the mouth and are used to bite and tear the meat they eat.

Carnivore: an animal that eats only animals.

Climate: the weather in some location averaged over some long period of time

Ecosystem: a unit of plants, animals, and nonliving components of an environment that interact

Environment: the total surroundings and forces that act upon a living thing

Habitat: the place where an animal lives.

Herbivore: an animal that eats only plants.

Inborn Behavior: a behavior an animal is born with and does not have to learn

Incisors: long, sharp front teeth that help animals cut and gnaw hard plant parts, such as seeds, nuts, and wood

Learned Behavior: a behavior an animal learns but is not born with

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Molars: large flat teeth found on the sides of the mouth. These are used by plant-eating animals to grind and crush the grass they eat.

Omnivore: an animal that eats both plants and animals.

Predator: an animal that eats other animals.

Prey: an animal eaten by another animal.

Reflexes: inborn behaviors that are quick and automatic actions

Temperate: without extremes, describes a climate that has a range of temperatures within moderate limits

Tropical: hot and humid, as in the tropics

III. Websites:

Santa Barbara Zoo. Animal Fact Sheets. <http://www.santabarbarazoo.org>

Oakland Zoo: Animals A to Z. <http://www.oaklandzoo.org/atoz/atoz.html>

Enchanted Learning: Biomes.

<http://www.enchantedlearning.com/biomes/>

Wheeling Jesuit University: Adaptation.

<http://www.cotf.edu/ete/modules/mse/earthsysflr/adapt.html>

IV. Books

How Do Animals Adapt (The Science of Living Things) Kalman, Bobbie

Would You Survive? Animal & Plant Adaptation Townsend, John

Animals: Classification and Adaptation Sylvester, Doug