CINCINNATI ZOO & BOTANICAL GARDEN

Frisch's Outreach: Mammals (4-6) Extensions

At a glance

This program will allow your students to gain further insight into the subject of mammals and their adaptations.

Goal

This class is designed to familiarize students with the many unique adaptations mammals possess.

Objectives

1. Students will be able to list adaptations mammals have that that other animals have, and those that no other animals have.
2. Students will be able to name ways mammals are categorized.

Students will be able to describe the features of mammals that put them in specific groups.

Theme

Mammals have unique adaptations that help them survive in many different habitats.

Sub-themes

1. Mammals are very beneficial to people for many different reasons.

2. Mammals have a wide variety of adaptations that are unique to their group.

Academic standards

Ohio Science Academic Content Standards	*Fourth Grade Standards* Life Sciences Diversity & Interdependence of Life 5 Scientific Ways of Knowing 1 *Fifth Grade Standards* Life Sciences Diversity & Interdependence of Life 4,5,6 Doing Scientific Inquiry 3 Scientific Ways of Knowing 1 *Sixth Grade Standards* Life Sciences Characteristics & Structure of Life 2 Diversity & Interdependence of Life 8

	Scientific Inquiry Doing Scientific Inquiry 3,4 Scientific Ways of Knowing Nature of Science 1 Science & Society 3
Kentucky Core Content—Science	Life Science: *Grades Primary through 4:* The Characteristics of Organisms: SC-E-3.1.2, SC-E-3.1.3 Life Cycle of Organisms: SC-E-3.2.2 Organisms And Their Environment: SC-E-3.3.1 Diversity and Adaptations of Organisms: SC-M-3.4.1, SC-M-3.5.2 *Grades 5-7* Structures & Function in Living Systems SC-M-3.1.1 Regulation & Behavior SC-M-3.2.1 Populations & Ecosystems SC-M-3.5.1, SC-M-3.5.2

Background

All mammals are endothermic (able to maintain a constant body temperature, regardless of changing external conditions), have a back bone, and are fully developed inside their mothers' body. All but two species (platypus and echidna) are born alive. Babies are nourished by milk produced by mammary glands in the mother.
All mammals have hair or fur on their bodies. Hair and/ or fur can keep the mammal warm and help camouflage them in their environment. Most mammals have four legs (sea mammals and bats do not). Bats are the only mammals that can fly. (Mammals have conquered land, water, and air).
Mammals are very successful due to their ability to adapt to changes in their environment. Some mammals (especially primates) form complex societies.

There are several differences between mammals and other vertebrates, anatomically speaking. The lower jaw of a mammal is hinged directly to the skull, where in other vertebrates there is an indirect connection (usually involving another bone). The lower jaw of a mammal is very strong and acts as a powerful tool for eating. Mammals have three types of teeth; Incisors (which are good for biting), canines (which are good for gripping and tearing) and molars (good for grinding).
Another very distinctive part if a mammals body is its skin. The skin consists of 2 parts: epidermis and dermis. The epidermis is the protective outer layer of dead cells, and the dermis is the thin inner layer that contains glands, nerve endings and blood vessels. There are glands in the dermis called sebaceous (oil, or scent) glands, that secrete chemicals that animals use to communicate with.
Another type of gland in the dermis are sweat glands, which help mammals regulate their temperature.
There are different ways mammals catch and eat their food.
Carnivores eat meat, chase down their prey.
Herbivores eat plant material, which is all around them.
Omnivores eat both meat and plants.
Insectivores eat insects, and usually have small sharp teeth.
Reproduction in mammals:
There are 3 ways mammals are grouped when it comes to reproduction; Monotremes, Marsupials, and Placental Mammals. Monotremes consist of the Duck bill Platypus and the Echidna. These mammals are like no other in that

they lay eggs. Marsupials do not have placenta. These mammals are poorly developed when born and are nourished by their mothers milk. Some marsupials spend time growing in a pouch outside their mothers body until they are developed. (short tailed opossum is a marsupial). Placental Mammals are the most common and most numerous.

Vocabulary

Adaptations- (noun) - Something that helps an animal survive.

Canine- tooth situated between the lateral incisor and the first premolar

Classify- to arrange in classes, according to subject matter**:** to assign to a category

Cold Blooded- pertaining to animals, as fishes and reptiles, whose blood temperature ranges from the freezing point upward, in accordance with the temperature of the surrounding medium.

Ectothermic- cold blooded

Endothermic- warm blooded

Habitat- Natural home or dwelling place of an organism.

Hair- grows from the skin of humans and animals.

Hibernation- Spending the winter in close quarters, in torpid or lethargic state.

Incisors- a front tooth typically adapted for cutting

Live Birth- the condition of being born in such a state that acts of life are manifested after the extrusion of the whole body.

Mammal- endothermic, hair, live birth, take care of young,

Mammary Glands- on female mammals, secrete milk for young.

Migration- To pass periodically from one region or climate to another for feeding or breeding.

Mimicry- The superficial resemblance which some animals exhibit to other animals or to the natural objects among which they live; thereby, securing concealment, protection or the like.

Molar- the back teeth, a tooth with a rounded or flattened surface adapted for grinding

Movement- Change of place, position or posture; particular act or manner of moving.

Sebaceous Gland- oil gland

Survival- Living or continuing longer than something else.

Vertebrate- having a backbone or spinal column.

Warm blooded- pertaining to animals, as mammals and birds, whose blood ranges in temperatures from about 98° to 112°F (37° to 44°C) and remains relatively constant.

Extensions

Go on a mammal hunt! Take a walk outside around the school/neighborhood. See how many mammals you can find.

Write them down, and see how many different ways you can categorize them.

My Life As……..!
Write journal entries detailing your life as a different Mammal Tell what each day would be like. What is easy about your life? What is difficult? Be sure to tell why your life is important to our natural world!

Play a "Who am I?" game. Tape a picture of a Mammal on the back of a student without identifying it. Allow the rest of the class to see the picture. Encourage the student with the picture to ask the group yes/no questions as a means of identifying the Mammal. The student's questions may focus around adaptations (ex. body coverings and behavior), habitat, food choice, etc.

Resources

Burton, John. Mammals of North America. Thunder Bay Press. San Diego. 1995.

George, Michael. Mammals. A Child's World, Inc. 1992.

Parker, Steve. Eyewitness Books Mammal. Alfred A. Knopf. New York. 1989.