



Vertebrates
Grades 4 - 6
Teacher Packet

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For age-appropriate In-Zoo Activities, please visit:

<http://www.pittsburghzoo.com/zoo.asp?ContentID=228>



Vertebrates

Grades 4-6: Explore the five vertebrate classifications by examining their similarities and differences.

Academic Standards for Environment and Ecology

4.6 Ecosystems and Their Interactions

- 4. 6. 4 A Understand that living things are dependent on non-living things in the environment for survival.

4.7. Threatened, Endangered, and Extinct Species

- 4. 7. 4 A Identify differences in living things.
- 4. 7. 7 B Know that adaptations are important for survival.

Academic Standards for Science and Technology

3.3 Biological Sciences

- 3. 3. 4 A Know the similarities and differences of living things.
- B Know that living things are made up of parts that have specific functions.



Vertebrates Chart

	Fish	Amphibians	Birds	Mammals	Reptiles
Body Coverings	Skin or Scales Covered in Mucus	Moist Skin	Feathers	Fur or Hair	Scales
Appendages	Fins	Legs	Wings and Legs	Limbs Wings Flippers	Legs Flippers None
Body Temperature	Cold Blooded (Ectothermic)	Cold Blooded (Ectothermic)	Warm Blooded (Endothermic)	Warm Blooded (Endothermic)	Cold Blooded (Ectothermic)
Respiration	Gills Labyrinth Organ	Gills (juvenile) Lungs (adult) Skin	Lungs	Lungs	Lungs
Birth	Lay Eggs Live Birth	Lay Eggs	Lay Eggs	Live Birth Lay Eggs (2 species)	Lay Eggs Live Birth



Vocabulary

Adaptation - Behavioral or physical change that improves a species' chance for survival in its habitat.

Biodiversity - The variety of life on our planet.

Camouflage - An organism's ability to hide or blend with its surroundings using color, pattern, or shape.

Conservation - The wise use of natural resources in order to ensure continued availability to future generations.

Ecology - The study of the interrelationships between organisms and their environment.

Ethology - The scientific study of animal behavior.

Invertebrate - An animal without a backbone.

Niche - The role played by an organism in a biological community.

Predator - An animal that kills and eats other animals.

Prey - An animal that is killed for food.

Vertebrate - An animal with a backbone.



Suggested Reading List

Biography of a Rhino by Alice Lightner Hopf
Extremely Weird Primates by Sarah Lovett
Gentle Ben by Walt Morey
Jeremy and the Gorillas by Lilian Bourd
Julie of the Wolves by Jean Craighead George
The Jungle Book by Rudyard Kipling
The Leopard by Cecil Bodker
The Robot Zoo by John Kelly
Travelers by Night by Vivien Alcock
Vertebrate Adaptations by Scientific American

Teacher Resources

Endangered Arctic by Toni Albert
Endangered Coral Reef by Toni Albert
Mountain Animals in Danger by Gary Turbak
Ocean Animals in Danger by Gary Turbak
Who's Endangered on Noah's Ark - Literary and Science Activities for Teachers and Parents by Glenn McGathery and Norma J. Livo

Internet Resources

Vertebrate Anatomy: www.bishops.ntc.nf.ca/wells/verts/vertanat.htm
Fish Anatomy: www.aqua.org/education/teachers/activities/fishanatomy.html
Anatomy: www.innerbody.com/htm/body.html
Vertebrate Anatomy: www.lions.odu.edu/~kkilburn/vzhome
Curriculum Web: www.curriculumweb.org
Marine Sciences Resources: www.resinets.com
Tree of Life: www.tolweb.org/tree/phylogeny.html



Where in the World is? Pre-Visit Activity

OBJECTIVES:

- The student will create an informational brochure about a vertebrate species
- The student will acquire information through Internet searches and resource materials

MATERIALS:

- Computers and printers
- If not using computers: magazines, construction paper, scissors, glue, markers, pens
- Animal resource materials (encyclopedias, animal books, Internet resources)
- Brochures to be used as examples
- Overhead projector or chalkboard

PROCEDURE:

Anticipatory Set:

Explain to the students that today they will get the opportunity to become globe trotting, graphic artists. Their project will be to create an educational, tri-fold brochure about a vertebrate species. To help them get the feel for creating a brochure, pass around a variety of brochures. Break the class into small cooperative groups, and have them evaluate and take notes on what they liked and disliked about the brochures (colors used, size of pictures, font, amount of information, etc.) Once the groups have finished looking at the brochures, have them share their likes and dislikes. You may want to write these on the overhead or chalkboard as reminders to the class while they are working on their own brochures.

Development of Lesson:

The students will need to choose a vertebrate and gather information on it. Each student's brochure must include the following items:

- The title of the brochure: *Where in the World is (the animal's name)?*
- A map highlighting where the chosen animal lives
- A brief description of what the weather is like where the animal lives
- At least three pictures



- A *Fun Facts!* section, which should include some amazing facts about the animal
- A *What You Can Do!* section, which should include ideas on what individuals can do to protect the animal and its habitat

SUMMARY:

Once all of the brochures have been created, have each student present their brochure to the class. You may wish to do this individually, or by holding a *Brochure Extravaganza*, where they display and explain their brochures to a visiting classroom.

EXTENSIONS:

- Have the students plan a trip to the animal's habitat. They can find the cost of flights, hotels, and car rentals.
- Create an infomercial about the animal.



Vertebrate Grab Game

Post-Visit Activity

OBJECTIVES:

- Students will be able to define vertebrate and describe four characteristics that distinguish mammals from other vertebrates.
- Students will also be able to describe several characteristics of two other vertebrate classifications.

MATERIALS:

- 10 pictures from each of the following vertebrate classifications: mammals, birds, amphibians, reptiles, and fish
- Chalkboard
- One copy of Vertebrate Clues for the instructor

PROCEDURE:

Anticipatory Set:

Begin by drawing five columns on the chalkboard with the five vertebrate classifications as headings – mammals, birds, amphibians, reptiles, and fish. Have students find and cutout pictures of animals representing the different vertebrate classes from nature / wildlife magazines. Each picture should be pasted to cardboard or posterboard and then tallied on the chalkboard. Each vertebrate classification should end up with 10 pictures.

Once completed, have the students brainstorm the characteristics of each of the five vertebrate classifications. Write these characteristics within the appropriate column on the chalkboard.

Instruct the students that today they will be playing the Vertebrate Grab Game that will utilize their vertebrate pictures while they review what they have learned about the five vertebrate classifications.



Development of Lesson:

- Divide the students into two equal teams and have the teams line up, facing each other, on opposite sides of a large open space (i.e. grassy field or gym). The teams should be about 50 feet apart. Have the students count off on each team and remember their numbers.
- Line up the cutouts of the vertebrates that were made earlier in the center of the field between the two teams. Explain that you will read a statement from your copy of Vertebrate Clues that describes one or more of the vertebrate classifications. The students must listen carefully and try to figure out which vertebrate group or groups you are describing.
- When you call out a number, the student from each team with that number must run to the center of the field, find a cutout of an appropriate vertebrate classification, and then run back to his or her team. The first student to do so will win a point. The team with the most points after all of the vertebrate clues have been read is the winner.

This activity is courtesy of Ranger Rick's Nature Scope – Amazing Mammals distributed by the National Wildlife Federation.