



Animals with Backbones

for 5th grade students

This hour-long program provides 5th grade students a brief hands-on review of vertebrate classification and the unique survival characteristics of fish, amphibians, reptiles, birds, and mammals.

Students will see one or more of the following animals up close – tadpoles, frogs, salamanders; lizards, snakes, turtles; pigeon, chicken; ferret, rabbit, hedgehog, chinchilla, naked mole rat, armadillo, or rat – and will be encouraged to classify them according to observable characteristics. They also will be encouraged to compare and contrast the animals and consider survival advantages of certain adaptations. For example, how reptiles are better suited than amphibians to life on land.

This 60-minute program is best presented at the Zoo, where students will have the opportunity to see a large variety of animals. However, the program can be presented in the school classroom, if the class is unable to schedule a field trip. Also, if we are repeating the program, our docents really appreciate it if they do not have to pack everything up and move from one classroom to another. However, DO NOT schedule the program in the school cafeteria because of the live animals.

“Animals with Backbones” is aligned to 5th grade Life Sciences Standard 1.
All organisms have structures and systems with separate functions.

**To schedule this program,
or for more information,
call 561-1452, ext. 125.**

Amphibians and Reptiles Vocabulary

Adaptation:	An alteration or adjustment in structure or habits by which a species or individual improves its condition in relationship to its environment.
Amphibian:	An animal that typically lives in an aquatic habitat breathing by gills as young, and primarily in a terrestrial habitat breathing by lungs and through moist glandular skin as an adult.
Carnivore:	An animal whose diet consists primarily of meat.
Classification:	In biology, the arrangement of organisms into a hierarchy of groups on the basis of their similarities.
Cold-blooded:	Ectothermic: body temperature that is largely dependent on the temperature of the air or water in which it lives.
Development:	The real life property of getting older.
Endangered:	In danger of becoming extinct.
Extinct:	Gone forever.
Flipper:	A flat limb used for swimming, such as in seals or whales.
Habitat:	The arrangement of food, water, shelter or cover, and space suitable to an animal's needs.
Herbivore:	An animal whose diet consists primarily of plants (leaves, grass, fruits, etc.).
Incubate:	To keep eggs warm so babies can develop and hatch.
Invertebrate:	An animal that does not have a backbone.
Metamorphosis:	The period during the life-cycle of many invertebrates, most amphibians, and some fish during which the individual's body changes from one form to another through a major reconstitution of its tissues (e.g., frogs are produced by metamorphosis from tadpoles).
Omnivore:	An animal that feeds on plants and animals.
Poisonous:	Refers to animals that are harmful when consumed or touched. [<i>Note: venomous should be used when referring to animals that inject venom into their prey.</i>]
Reptile:	Cold-blooded vertebrates that have hard-shelled, yolk-filled eggs that are laid on land and from which fully formed young are born. Includes snakes, lizards, crocodiles, alligators, and turtles.
Shed:	To let something fall or drop off. Many reptiles shed their skins over and over as they grow.
Venomous:	Refers to animals that inject venom into their prey. [<i>Note: poisonous refers to animals that are harmful when consumed or touched.</i>]
Vertebrate:	An animal with a backbone, such as a mammal, bird, reptile, amphibian, or fish.

Birds

Adaptation:	A change that a living thing goes through as it fits in with the environment. Feathers on the wings of a bird are an adaptation for flight.
Carnivore:	An animal whose diet consists primarily of meat.
Carrion:	The bodies of dead animals, usually found in nature in the process of decay.
Conservation:	Action taken to protect and conserve the natural world, usually from pollution, overexploitation, and other harmful features of human activity.
Contour feathers:	Feathers that give birds their outer covering and distinctive colors.
Crepuscular:	Active at dawn and dusk.
Dimorphism:	Two distinct forms: sexual dimorphism – male/female differences in color seen in some bird species, such as ducks.
Diurnal:	Active during the day (opp. of nocturnal).
Down feathers:	Soft, fluffy undercoat feathers that keep birds warm.
Endangered:	In danger of becoming extinct.
Extinct:	Gone forever.
Flight feathers:	The large, stiff feathers on a bird's wings.
Habitat:	The arrangement of food, water, shelter or cover, and space suitable to an animal's needs.
Herbivore:	An animal whose diet consists primarily of plants (leaves, grass, fruits, etc.)
Hover:	To remain in the air in one place.
Incubate:	To keep eggs warm so babies can develop and hatch.
Insectivore:	An animal or plant that eats insects.
Molting:	The process of gradual feather replacement with new feathers.
Nocturnal:	Active at night (opp. of diurnal).
Omnivore:	An animal that feeds on plants and animals.
Predator:	An animal that kills and eats other animals.
Preening:	Bird grooming behavior that keeps feathers in good order.
Prey:	An animal that is killed and eaten by other animals.
Raptor:	A bird-of-prey.
Scavenger:	An animal that habitually feeds on refuse or carrion.
Talon:	The sharp claw of a bird-of-prey, such as an owl, hawk, or eagle.
Vertebrate:	An animal with a backbone, such as a mammal, bird, reptile, amphibian, or fish.
Warm-blooded:	Endothermic. Having a body temperature that remains approximately the same, whatever the temperature of the surroundings.
Web-footed:	Feet that have a thin layer of skin stretched between the toes.

Mammals

Antlers:	Large, branching, bony structures on the head of a deer; shed each year.
Aquatic:	Growing, living in, or frequenting water.
Arboreal:	An animal that lives in trees.
Camouflage:	Colors or structures that allow an animal to blend with its surroundings to avoid detection.
Canine teeth:	The pointed teeth on each side of the mouth between the incisors and the premolars, used for catching and killing prey, and tearing flesh.
Carnivore:	An animal whose diet consists primarily of meat.
Carrion:	The bodies of dead animals, usually found in nature in the process of decay.
Crepuscular:	Active at dawn and dusk.
Diurnal:	Active by daylight (opp. of nocturnal).
Endangered:	A species that is in danger of extinction throughout all or a significant portion of its range.
Extinct:	Gone from existence.
Gestation:	Time spend in the uterus from conception to birth.
Herbivore:	An animal whose diet consists primarily of plants (leaves, grass, fruits, etc.).
Horns:	Hard, bony projections from the head of a hoofed animal; they are usually permanent.
Incisors:	Sharp teeth at the front of the mouth, used for biting or nibbling.
Insectivore:	An animal or plant that eats insects.
Mammal:	A class of vertebrates covered with hair or fur that produce live offspring and nourish them with milk produced in mammary glands.
Marsupial:	A pouched mammal.
Molars:	The broad, flat teeth at the back of the mouth used for grinding food.
Monotreme:	An egg-laying mammal (e.g., platypus or echidna).
Nocturnal:	Active by night (opp. of diurnal).
Omnivore:	An animal whose diet consists of a variety of plants and animals.
Placenta:	The structure in the uterus through which a developing mammal receives nourishment and eliminates wastes.
Prehensile:	Adapted for seizing and grasping, esp. by wrapping around.
Rodent:	A gnawing mammal.
Scavenger:	An organism that habitually feeds on refuse or carrion.
Terrestrial:	Growing or living on land (as opposed to water).
Undercoat:	Short, dense fur next to the skin; often covered by a longer coat.
Velvet:	Soft, smooth, covering of growing antlers; contains blood vessels that bring nutrients to the antlers.
Vibrissa(e):	Whisker(s). One of the stiff hairs that are located esp. about the nostrils or on other parts of the face in many mammals; often serve as tactile organs.
Warm-blooded:	Endothermic. Having a body temperature that remains approximately the same, whatever the temperature of the surroundings. Opposite of cold-blooded.

Pre-Zoo Activity

Introduction to Classification

1. Sorting Building Blocks

Objective:

To provide students with a basic understanding of classification.

Materials:

Lego or other building blocks in assorted colors and sizes.

Procedure:

Divide class into teams of 3 or 4 students.

Give each group a variety of Lego blocks.

Tell each team to separate the Lego into groups with similar characteristics. It is likely that each team will do this in a different way (sorting by color, size, purpose...)

Each team then explains to the class how they grouped their Lego and why they chose to do it that way.

Note: There is no correct way to sort Legos!

2. Sorting toy animals

Objective:

To provide students with a basic understanding of animal classification.

Materials:

An assortment of plush or rubber toys. Try to have representatives from all the major vertebrate classes: fish, amphibians, reptiles, birds, and mammals. An invertebrate group would also be good. Each student could bring one toy from home.

Containers (boxes, buckets, drawers, circle on floor) for placing sorted animals.

Procedure:

Pick up a toy and ask the students in which container the toy should be placed. (Any container is fine).

Pick up the next toy and ask again.

Continue with the other toys.

The students will intuitively classify most animals correctly, although they may have trouble with amphibians and reptiles. (*Teacher: These could either be left together, and the Zoo Docent will introduce the differences*).

When all the toys have been classified, lead the students in a discussion of how they knew where to put each toy. Write answers on a chart or blackboard and soon, the students will have created their own definitions for the major vertebrate classes.

Cold-blooded creatures

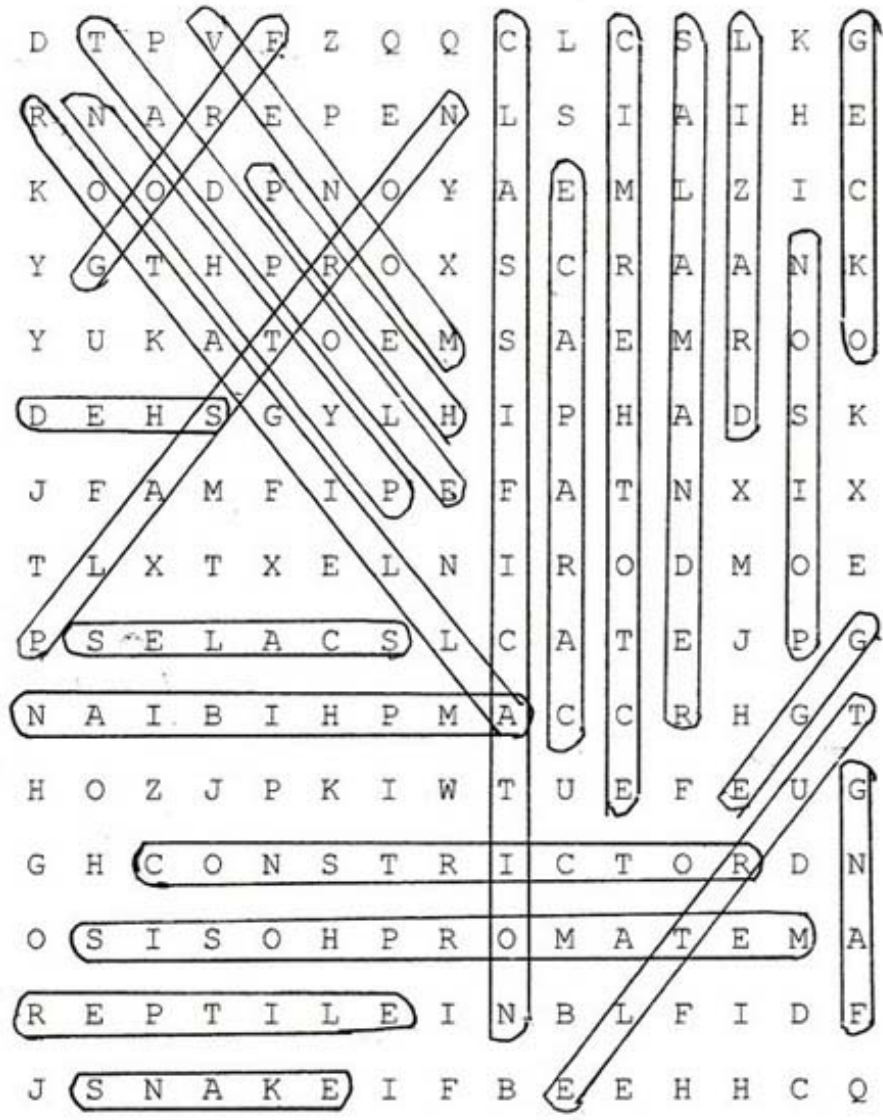
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ALLIGATOR
CLASSIFICATION
EGG
GECKO
METAMORPHOSIS
PYTHON
SCALES
TADPOLE

AMPHIBIAN
CONSTRUCTOR
FANG
HERP
PLASTRON
REPTILE
SHED
TURTLE

CARAPACE
ECTOTHERMIC
FROG
LIZARD
POISON
SALAMANDER
SNAKE
VENOM

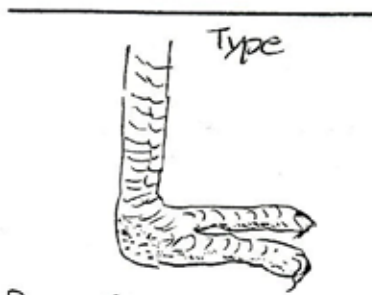
Cold-blooded creatures



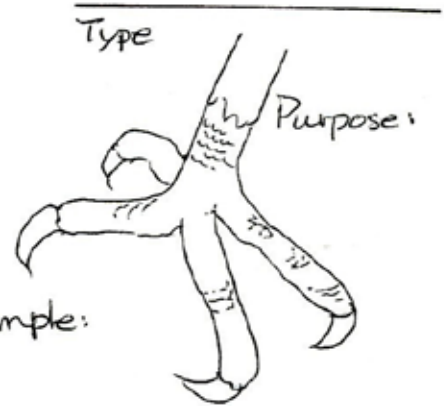
ALLIGATOR
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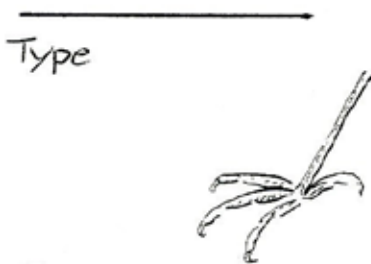
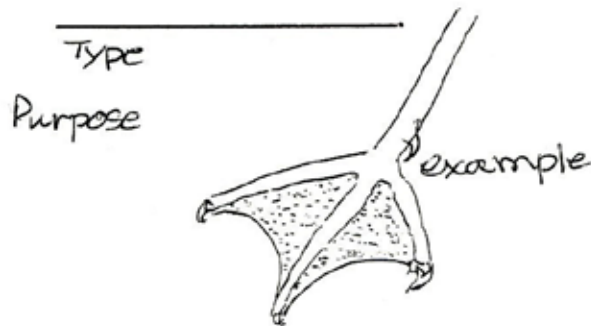


Purpose:
example:

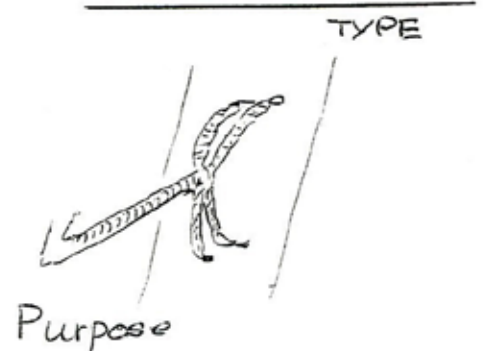


example:

FABULOUS FEET..
HOW ARE THEY USED?

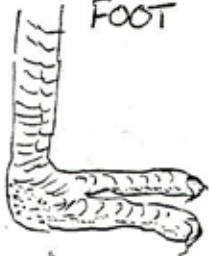


Purpose
example



Purpose

RUNNING FOOT



- large, heavy strong
- only 2 toes
- ostrich, emu

GRASPING FOOT



- very strong
- long talons
- grasps and squeezes prey

Raptors

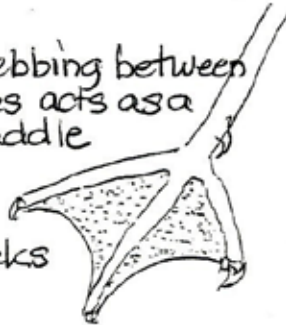
FABULOUS FEET..

HOW ARE THEY USED ?

SWIMMING FOOT

- webbing between toes acts as a paddle

Ducks



PERCHING FOOT



- allows bird to grasp and sit on a branch or wire
- Robins, finch

CLIMBING FOOT



- 2 toes forward, 2 toes backwards allows bird to climb and cling to tree trunk
- woodpeckers

What's your mammal IQ?

Name a mammal that:

1. can fly _____
2. is a herbivore _____
3. is extinct _____
4. is a marsupial _____
5. can run more than 50 mph _____
6. lives in social groups _____
7. is related to wolves _____
8. has a pouch _____
9. has a special way of protecting itself _____
10. is the largest member of the deer family _____
11. has fins _____
12. is a rodent _____
13. is found only in Australia _____
14. is native to South America _____
15. is aquatic _____
16. hibernates _____
17. migrates _____
18. stands almost 20 feet tall _____
19. is the largest animal ever to live on the earth _____
20. is born blind and helpless _____
21. is up and running within a short time of birth _____
22. can hold its breath for an hour _____
23. is diurnal _____
24. eats insects _____
25. has tusks _____

Post-Zoo Activity

Build a Colorado Food Web

Procedure:

Step 1.

Research: Allot each student one or more Colorado animals to research.

Ideally, students should gather the data for this activity while at the Zoo. They should use the Zoo Exhibit plaques to find their information.

Alternatively, students should research one or more Colorado animals in the library or on the Internet.

Have each student look for the answers to the following questions on one or more animals of their choice:

1. Is this animal a carnivore, herbivore, or omnivore?
2. Is this animal an arthropod (insect, spider, etc.), amphibian, reptile, bird, or mammal?
3. Is the habitat of this animal plains, shrub land, mountain, or aquatic?
4. Is this animal nocturnal or diurnal?
5. To what extent does this animal depend on camouflage?
6. What are this animal's predators?
7. What are this animals' prey items?

Step 2.

Each student should construct several possible food chains for their chosen animal(s). Remember, the arrows will follow the direction of energy flow: sun; producers (plants); primary (herbivore), secondary, and tertiary consumers. They should draw a different color box around each and write a key (e.g., green box: producer; yellow box: primary consumer; etc.)

Step 3.

Divide students into groups of 4 (each with different animals) and ask them to use their food chains to compile a Colorado food web (in poster format, using pictures from magazines etc., or hand-drawings, not words).

Step 4.

Groups share their food webs with the class.