CRITTER COVERS

The overall emphasis of this animal unit is body coverings of vertebrate animals (animals with backbones).

This learning unit contains information and activities that will assist in planning and carrying out a variety of activities and an educational field trip to the Caldwell Zoo. Included are suggested activities to do before and after the Zoo visit and a summary of information to be covered during the Zoo class. The Zoo's goals are to:

1. Encourage inquisitiveness about the natural world.
2. Help each child find answers for his/her own questions.
3. Aid development of understanding and factual knowledge of the environment.
4. Improve each child's ability to think rationally.
5. Promote creative and productive imaginations.
6. Provide a fun learning experience.

The zoo class and enclosed activities will also help to fulfill the following Texas Essential Knowledge and Skills (TEKS) for science:

Kindergarten:	112.11b: **1** A&B, **2** A, **4** B, **9** A, **10** A&B
First Grade:	112.12b: **1** A&B, **2** A, **9** A, **10** C&D
Second Grade:	112.13b: **1** A&B, **2** A, **10** A

Additional activities may meet other TEKS.

CRITTER COVERS

Early in the 18th century, Carolus Linnaeus developed a system to classify organisms. He gave each organism a two-word Latin name, so there would be no confusion over different names in different regions of the world. The first word tells the genus while the second is the species name and is much more specific and descriptive. The species name describes animals that are alike and can reproduce. This system of classification is very helpful to scientists who study living plants or animals.

Organisms are classified into progressively larger groups. Note the classification for a lion:

KINGDOM (Animalia)
PHYLUM (Chordata)
CLASS (Mammalia)
ORDER (Carnivora)
FAMILY (Felidae)
GENUS (Panthera)
SPECIES (leo)

Most scientists believe there are five kingdoms—one-cell organisms, fungi, monera (bacteria), plants and animals.

Invertebrate animals do not have backbones. Invertebrate species are very numerous and include such animals as sponges, crabs, clams, sea stars, insects, protozoa, worms and snails. This unit will focus on vertebrate animals—animals with backbones.

All vertebrates have an internal skeleton of bone or cartilage and a closed circulatory system with at least a two-chambered heart.

VERTEBRATE CLASSES OF ANIMALS

THE FISHES

Class Agnatha: jawless fish with no paired fins. Includes lampreys (about 40 species) and hagfish (about 32 species).

Class Chondrichthyes: fish with jaws and skeletons made of cartilage. Includes sharks and rays (about 700 species).

Class Ostechthyes: bony fish with jaws, **swim bladder** and **scales.** Fish **need oxygen** and obtain the needed oxygen from the water through gills. Fish use **fins** to propel themselves through the water. Fish may or may not have teeth. Includes most fish familiar to humans (about 20,000 species).

THE AMPHIBIANS

Class Amphibia: animals with **skin kept moist by mucous glands**. Amphibians are **cold-blooded** animals that **must spend at least a portion of their life**

cycle in water. The word “amphibian” means “double life.” All amphibians go through a metamorphosis as they grow into adulthood. For example, a frog begins life as an egg in the water, hatches into a tadpole and eventually grows into a frog. The amphibians include frogs, toads and salamanders/newts.

THE REPTILES

Class Reptilia: animals with **dry, scaled skin**. Reptiles are able to complete their entire life cycle on dry land. Reptiles have **a three-chambered heart** and usually have **two lungs**. All reptiles are **cold-blooded**. Reptiles include turtles/tortoises, snakes, alligators/crocodiles and lizards.

THE BIRDS

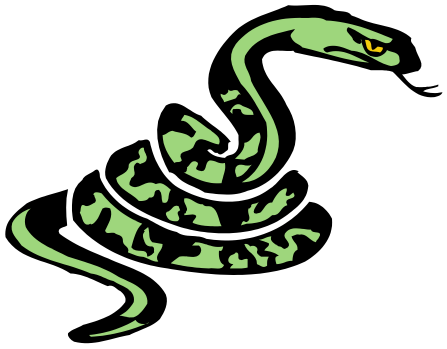
Class Aves: animals with **feathers** and **wings**, although not all birds fly in the air. All birds **lay eggs**. They are **warm-blooded** and adapted for **light weight**. A bird’s **brain is very heavy and large** in proportion to its body weight. Birds can see better than humans. This class includes all species of birds.

THE MAMMALS

Class Mammalia: animals with **mammary glands** which supply milk for **young that are born alive**. All are **warm-blooded** and have **hair at some point in their development**. Mammals have well-rooted, **specialized teeth**. Most mammals have two successive sets of teeth (milk and permanent). All have a two-part torso that is clearly divided into chest and abdominal regions. Mammals have lungs and **breathe air**. A **highly developed brain** is also a characteristic of mammals. This class includes rodents, carnivores, hoofed animals, bats, marsupials, pinnipeds (seals and sea lions), elephants and primates. Also a part of this class is the monotremes, egg-laying mammals such as the echidna and duck-billed platypus.

CLASSROOM ACTIVIES

The activities on the following pages are for use before and/or after your Zoo visit.



CRITTER COVERS ACTIVITIES

1. As an opening activity, have children think about how their class could be divided into groups (blue eyes/brown eyes, short hair/long hair, etc.). Explain that scientists group animals by common characteristics. Children can also sort objects or pictures by common characteristics. Children could sort buttons, seashells, marbles, leaves, pictures, etc.

2. After reading Animals Should Definitely Not Wear Clothing by Judy Barrett have children design clothes for real or imagined animals.

3. Look at pictures of animals. Discuss:
the type of body covering on each animal
how the body covering helps the animal (warmth, camouflage, etc.)

4. Try a new art technique—paint with a feather or strip of fake fur.
Make a collage from eggshells. (Be sure to thoroughly wash eggshells before using with children to minimize the risk of salmonella.) Crush eggshells and glue onto paper to create an animal or a special design. Eggshells may be dyed before crushing to add color to the artwork.

5. Obtain a microscope or strong magnifying glass. Allow children to study hair, feathers, snake shed, turtle shell or other animal body coverings.

7. Ask children how they think various animals might feel if we touched them. (Remind children that it is dangerous to touch wild animals.) Have each child create an imaginary animal. Using a variety of textured materials (fake fur, cotton balls, pasta, sandpaper, corduroy, sponges, yarn, etc.), let child add a special body covering to his/her animal.

8. COVERINGS GAME: (Played like Simon Says)
One leader is chosen. The rest of the group is seated. The leader tells the players which body covering he/she is looking for, i.e. feathers, fur, scales, etc. The leader quickly names a variety of animals. Players stand when they hear an animal named that is covered with the body covering the leader is looking for. When an animal is named that does not have the special body covering, players sit down.

9. FEATHER OLYMPICS:
Feather Blow Relay: Blow a feather a specified distance and then return to let the next player go.
Fluff Relay: Carry feathers on a plate or spoon. The players must pick up any feathers that drop.

MAMMAL OLYMPICS:

Set up a 100 yard running course. Let children take turns running the course. Use a stopwatch to time the runs and compare children's time with animal running speeds.

Adult human	5-6 seconds	
African elephant	3 seconds	(25 mph)
Fox	2 seconds	(40 mph)
Gazelle	a little more than 1 second	(50 mph)
Cheetah	less than 1 second	(70 mph)

10. Help children discover how the color of an animal's body covering can affect body warmth/coolness. A black object absorbs more waves of energy than a white object, causing the object's temperature to rise. Obtain two thermometers. Cover the bulb of one thermometer with black paper and one with white paper. (Make certain the papers are the same weight.) Place the thermometers in direct sunlight and keep a record of their temperature readings. Which is warmer? What is the temperature difference?

11. On chalkboard label columns *mammal, bird, reptile, amphibian, fish.* Invite children to take turns naming animals that fit into each category.

12. Have children keep a list of animals they see in a week then "sort" the list into *mammal, bird, reptile, amphibian, fish.*

13. Have a special stuffed friend day. Allow children to bring a favorite stuffed friend. Classify each animal as mammal, bird, reptile, amphibian or fish. Do some of the animals not fit into one of the five vertebrate classes?

VOCABULARY TO KNOW

ALBINISM	Inherited deficiency of pigment. Albinos have milky or translucent skin and eyes with deep red pupil and pink or blue iris.
AMPHIBIOUS	Adapted for life on land and in water.
CHARACTERISITC	A feature or trait possessed by individual members of a group. A characteristic is a physical feature; the way it is used is called an adaptation.
COLD-BLOODED	Having a body temperature that varies with the environment. Also, ectothermic or poikilothermic.
FAUNA	Pertaining to animal life.
FLORA	Pertaining to plant life.
INVERTEBRATE	Organism without a backbone.
MAMMAL	A vertebrate in the class, Mammalia. All have hair and mammary glands. They breathe air, are warm-blooded, and have a four-chambered heart.
MAMMARY GLAND	Gland present in female mammals which secretes milk.
MELANISM	Excessive pigment which leads to development of black or nearly black coloration.
METAMORPHOSIS	A series of changes in form and shape during an animal's development.
MONOTREME	A mammal which lays eggs.
NOMENCLATURE	Scientific names of plants and animals.
TAXONOMY	Science of classification. Arrangement of plants and animals into groups based on natural relationships.
VERTEBRATE	Organism with a backbone.
WARM-BLOODED	Having a constant body temperature.