Discovery Trunk
Teacher's Guide
Raging Reptiles
Grades 3-7

Description

Alligators, lizards, and turtles, Oh My! Reptiles are amazing creatures and they fill a special niche in the animal kingdom. Learn about Texas reptiles and what makes them so unique and even have the opportunity to pet a live turtle!

Goals/Concepts

- To identify the basic characteristics that define all reptiles and each of the four groups of reptiles.
- To introduce students to the concept that animals are grouped together because they have certain characteristics in common.
- To understand how reptiles regulate body temperature.

Texas TEKS

Third Grade: 112.14 Science

(b) Knowledge and Skills

(9) Organisms and environments. The student knows that organisms have characteristics that help them survive and can describe patterns, cycles, systems, and relationships within the environments. The student is expected to:

(A) observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem;

(B) identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field; and

(C) describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations.

(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments.

Fourth Grade: 112. 15 Science

(b) Knowledge and Skills

(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environment.

(A) explore how adaptations enable organisms to survive in their environment such as comparing birds' beaks and leaves on plants.

Fifth Grade: 112.16 Science

(b)Knowledge and Skills

(9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to:

(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements;

(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers.

(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to:

(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals;

(A) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors.

Sixth Grade: 112.18 Science

(b) Knowledge and Skills

(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:

(F) diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem.

Seventh Grade: 112.19 Science

(a) Introduction

E) Organisms and environments.

(i) Students will understand the relationship between living organisms and their environment. Different environments support different living organisms that are adapted to that region of Earth. Organisms are living systems that maintain a steady state with that environment and whose balance may be disrupted by internal and external stimuli. External stimuli include human activity or the environment. Successful organisms can reestablish a balance through different processes such as a feedback mechanism. Ecological succession can be seen on a broad or small scale.

(b) Knowledge and Skills

(11) Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations.

(B) explain variation within a population or species by comparing external features, behaviors, or physiology of organisms that enhance their survival such as migration, hibernation, or storage of food in a bulb.

(12) Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function.

(A) investigate and explain how internal structures of organisms have adaptations that allow specific functions such as gills in fish, hollow bones in birds, or xylem in plants.

Before Your Program/How to Set Up Your Room

- Teacher needs to be present at all times.
- Review the vocabulary with the students
- Please provide at least one clear table at the head of the classroom

Vocabulary

Cold-blooded: An animal whose body temperature is controlled by the temperature of its environment. Examples: fish, amphibians, reptiles.

Herpetology: The study of reptiles and amphibians.

Dinosaur: Literally means "terrible lizard;" a group of large, extinct reptiles. Dinosaurs are not lizards, however. They share certain characteristics but are in a group all their own. Dinosaurs walked with legs directly below the hips, whereas, other reptiles whose limbs splay out horizontally. Dinosaurs walked in an upright manner, rather than close to the ground like crocodiles and lizards. Whether dinosaurs were warm blooded is still under debate.

Endangered: Threatened with extinction.

Environment: One's surroundings, including all objects (plants, rocks, animals, water, etc.) and conditions (weather, temperature, humidity, etc.).

Extinct: Animals that no longer exist (such as the dinosaur).

Endotherm:

Exctotherm:

Fossil: A remnant or a trace of an animal or plant from past geologic ages.

Habitat: Place where a plant or animal is most likely to be found; its environment.

Nocturnal: Active at night.

Predator: An animal that lives by hunting other animals for food.

Prey: An animal hunted or caught for food by a predator.

Reptile: A cold-blooded, usually egg-laying vertebrate such as a snake, turtle, lizard, crocodile, tuatara, or dinosaur; has dry scales, breathes with lungs its entire life.

Vertebrate: An animal with a backbone; includes fish, amphibians, reptiles, birds, and mammals.

Carapace – a turtle's upper shell

Plastron – a turtle's lower shell

Scales – plates on the skin of a reptile

Scutes – enlarged scales on the skin that covers the bony shell of most turtles

Herbivore – an animal that eats only plants

Carnivore – an animal that eats only other animals

Omnivore – an animal that eats both plants and animals

<u>Reptile Myths</u>

Snakes don't have bones: All snakes have bones: skull and jawbones, backbones, and lots and lots of ribs. Large pythons, boas and anacondas may have 300-400 pairs of ribs.

All snakes are venomous: Out of the 110 species of snakes in the United States, only 20 are venomous. Venomous insects, fish, and poisonous plants pose more of a threat to humans than do venomous snakes. In fact, more people die each year of bee stings than snake bites. If you encounter a snake in the wild that you are

not sure about, leave it alone and it will leave you alone. Back away slowly; don't try to run it off by throwing things at it.

Snakes can hypnotize you with their stare: Snakes not only can't hypnotize you, most can't even see you very well. Lacking moveable eyelids, snakes can't blink; thus they even sleep with their eyes "open." Most snakes have very poor eye sight, and can only track the presence and movement of animals by their heat and when they move.

All lizards eat flies and other insects: Many species of lizards are vegetarians, consuming only leaves, flowers and fruits. Some species of lizards eat primarily plant matter with a few insects, other invertebrates, or small animals now and then. Others eat primarily invertebrates or only animals, including other lizards, snakes, amphibians, fish, birds and mammals. You cannot make a carnivorous reptile into a vegetarian and you should not feed animals to vegetarian lizards. Doing either will result in serious health problems and an early death.

Snakes can sting you with their tongues: When a snake flicks its tongue, it is smelling the air. If it flicks its tongue at you, it is learning whether you are something edible (no snakes eat people or food that people generally eat) or a possible danger to it, such as a snake predator. Snakes recognize their owner's by their smell, and recognize other people with whom they frequently interact. When a snake's tongue touches you, it has a light, feathery touch that may tickle a bit.

Only venomous snakes have teeth; that's why other snakes can't bite: All snakes have teeth, rows of recurved teeth (pointing backwards, rather like rows of sharp crochet hooks) that enable them to grip their prey. Venomous snakes have these teeth, plus special teeth, called fangs, that are used to deliver the venom. Some have fangs near the front of their mouth, others have fangs towards the rear of their mouths. Lizards have teeth, too, even vegetarian lizards like green iguanas.

Some snakes have stingers in their tails: No snakes have stingers in their tails. Some have hard skin on their tail tip that may be due to a variety of reasons, such as unshed skin or new scales emerging as the snake is growing. Some burrowing snakes may have a hardened tip on their tail that they use to push against the ground to give them some leverage as they burrow new tunnels.

Some snakes are vegetarians: No snake is a vegetarian, nor do any snakes eat vegetation. All snakes are carnivores with diets, depending on species, ranging from arthropods, other invertebrates, fish, amphibians, reptiles, birds, or mammals. Some snake species are cannibalistic and will eat other snakes, including members of their own species.

All snakes have to eat live prey: In the wild, snakes do not eat carrion. In captivity, however, most snakes who will eat rodents can be converted to feeding easily and willingly on prekilled rodents. This is more humane for the rodent and safer for the snake as many can be injured while catching and killing their prey. Many people believe that snakes "need" to kill their prey. Most do not, and those who do will still "kill" their already dead prey. Some people say that it is not natural to feed a snake (or rodent-eating lizard) killed prey. Captivity isn't natural, however. Many snakes are injured every year, some even dying of their wounds, from being fed live prey; since we are responsible for their well-being, one of the things we must do is make sure they will not be harmed during feeding.

You can spread special slime on a young turtle and get a Ninja turtle: There are no Ninja turtles, but many young humans are convinced that the turtle they catch in the yard, win at a fair, or buy at a pet store can in time be made into a Ninja. The Ninja Turtle craze has had a devastating impact on the world's water turtle population as millions of kids demanded their very own Raphael, Leonardo, Donatello, and Michelangelo, and parents who knew nothing about proper turtle care indulged them. Note: no turtle has ever survived on a pizza diet or in the sewer!

Turtles and tortoises just need a leaf of lettuce a day: A lettuce leaf, even lots of lettuce leafs, will starve a turtle or tortoise. Depending on the species, turtles and tortoises eat a wide variety of vegetables, fruits, leafy greens, even hays and grasses. Some water turtles eat invertebrates, fish, and crustaceans; some sea turtles enjoy a meal of jelly fish, seaweed, mollusks, eel grass, and other sea plants and invertebrates. Some tortoises and box turtles enjoy such tasty morsels as snails, slugs and worms.

It's okay to carve your name or other information into a turtle or tortoise shell: Humans can decide for themselves to get tattooed or pierced; turtles and tortoises don't have that choice. Their shells are made of living tissue - bone, skin, blood and nerves - and when you cut into them, it hurts. Cut into the shell and create an opening into the body cavity, and the turtle or tortoise may well die of infection. Since their shells are living tissue, they also should never be painted.

It's okay to poke a hole in a tortoise's shell and chain it so it won't escape from your yard or keep digging holes: It is not okay to do this...tortoises will keep straining and digging, some literally turning their feet into bloody stumps as they keep digging away at the concrete patio or hard earth, trying to do what comes naturally: burrow for protection from the sun and to nap. Chaining them can cause shell fractures, which, left untreated, can cause injury and death. Chaining and preventing them from digging may also cause such stress that they may sicken and die.

Reptiles are easy to care for. They make great pets for young children: Most reptiles available for sale in the United States are wild-caught; most are imported from other countries. Experts estimate that 50% of the animals shipped to the U.S. die before or shortly after arriving here, and that 90% of those who survive and are sold die within their first year in captivity. This high death rate is primarily due to the fact that most people who sell and buy them do not know what their needs are nor how to care for them properly, and most fail to seek out what information does exist on proper care. Reptiles are easy to care for only if you know what you are doing and what the animal needs.

Pre Visit Activity: Thermal Ecology

Materials:

- A set of 27 children's' play blocks.
- Sheet of black paper
- Sheet of white paper

Introduction:

Temperature is probably the most important single physical factor in the ecology of reptiles and amphibians and a great portion of the daily activity of many species is devoted to responding to the thermal environment. Unlike mammals and birds that internally produce large quantities of metabolic heat (warm-blooded), most reptiles have to rely on the external environment as a heat source (cold-blooded). All of the heat that enters or leaves an animal's body passes through the body surface that is exposed to the outside world. The more surface that is exposed, the more heat can enter or leave. The smaller the surface area, the less heat can enter or leave.
The amount of heat stored in the body is determined by body volume. The larger and bulkier the animal, the more heat it can store. An important factor in heat exchange with the outside environment is the surface of an animal's body compared to the body volume. For a given shape (a cube for example), as size increases the surface to volume ratio decreases. Reptiles often position themselves to either gain the most heat possible (example: exposing the whole side of the body to the sun) or to minimize the heat from the sun (exposing the narrowest part of the body to the sun). Upon reaching the ideal temperature, a reptile may seek relief from the heat by crawling into a shaded area or into water. Color is important to reptiles for various reasons. Light colors are often found in populations where heat from the sun is intense; light colors reflect heat. Dark colors are often

found in animals from cooler areas; dark absorbs heat. Many reptiles can change the skin color from light to dark.

Procedure #1: Explain the concept of surface to volume ratio with children's play blocks. One block has 6 sides so its surface to volume ratio is 6:1. Now arrange 27 blocks of equal size into a larger cube shape. Now the surface to volume ratio has changed to 54:27 (54 exposed sides: 27 blocks) or when the numbers are reduced it becomes a surface to volume ratio of 2:1. Ask students to imagine that a single block is a reptile – maybe a tortoise. The single block with the 6:1 ratio has a greater surface to volume ratio and would heat up rapidly in the direct sun. Also with its small volume, it would not hold heat for an extended period. Ask students to imagine the larger block that you have created with the 27 small blocks is a larger tortoise. The larger block (created from the 27 smaller blocks) has a smaller surface to volume ratio (2:1) and would take a longer period of time to heat up and due to its greater volume would hold the heat longer also. So this larger "tortoise" could stay in the sun much longer than could the smaller one. Now arrange the 27 blocks in a straight line and ask students to imagine it is a snake. Have students try to figure the surface to volume ratio (Answer 110:27 or a little more than 4:1). Ask them to consider how shape is important. The "snake" could not withstand periods in the sun as long as the larger block "tortoise" even though the total volume (number of blocks) is the same because it surface to volume ratio is larger. We know this may be difficult for some students to totally understand but in all probability they will get the general idea. Surface to volume ratio is essential to understanding an animal's size and shape.

Procedure #2: Place a thermometer under a sheet of black paper and place it in the sun or under a heat lamp. Place another thermometer under a sheet of white paper. Show that temperatures under the black paper are warmer. Explain that reptiles like crocodiles may be light tan to reflect heat because they live in the tropics; alligators, on the other hand, live in the cooler sub-tropics and may have darker skin to absorb heat. Use a cutout of a black paper lizard. Demonstrate that if the cutout is positioned perpendicular to the sun it absorbs the full impact of the sun's heat. If it is turned so that the length of the paper lizard is parallel to the rays of the sun (only the thickness of the paper is exposed to the heat), it remains cooler.

Post Visit Activity

Design Your Own Reptile Exhibit

Are your students convinced that they knew more about reptiles than any other class in the school and confident that they could do just about anything?

After a visit from the Museum of the Gulf Coast, your students may decide that they wanted to create their own exhibit on reptiles.

Procedure

1. Hold a class meeting to brain storm ideas. They may want to include books they have read, pictures they have drawn, reptile objects/artifacts, and maybe some live animals (students or other teachers may have animals they might let you use for a short period of time).
2. Research what is included in museum exhibits and what makes and exhibit successful.
3. Collect photographs/pictures and artifacts. Write labels to tell about each.
4. The students used the writing process to write the label copy. They draft, edit, and revise their own labels.
5. Once the final label is made it is matched to the picture, photograph, animal, and/or object.
6. Examine brochures from other museums and find out what makes a good promotion brochure. Use this as a way of designing your own brochure that can be passed out to other students.

7. The class then designs a museum opening invitation for parents, grandparents, friends, and volunteers.. Some students can work on a note to all the teachers in the school inviting all classes to schedule a tour of the exhibit. Keep track of the tours on a large class calendar in the classroom.