Reptile Rally

Curriculum Guide

Grades 9-12

Goal: Students will be able to identify the major groups of reptiles and list characteristics of all reptiles.

Association of Zoos and Aquariums Conservation Message:

Human beings are an integral part of all ecosystems.

a. Human activities within ecosystems affect these systems.

Sunshine State Standards:

- **SC.912.L.15.6** Discuss distinguishing characteristics of the domains and kingdoms of living organisms.
- **SC.912.L.17.4** Describe changes in ecosystems resulting from seasonal variations, climate change and succession.
- **SC.912.L.17.6** Compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism.

Background Information:

Reptiles are one of the five major groups of vertebrates (animals with backbones). All reptiles are **ectothermic** (cold-blooded), which means their body temperature changes with the temperature around them. Many are **oviparous** (egg-laying), but some, such as boa constrictors and blue-tongued skinks, are **ovoviviparous** or **viviparous** (animals that give live birth to their young). Unlike amphibians, reptiles look like smaller versions of their parents at the time they are born or hatch. Another characteristic that distinguishes reptiles from amphibians is that reptiles are covered with dry scales rather than slimy skin. Reptiles' waterproof scales help keep their bodies from drying out and provide a hard outer layer of protection. **Scales** are made up of keratin, which can also be found in fingernails, feathers, and hair. As reptiles grow, they must grow new scales, and they usually shed the old ones. Some reptiles, like snakes, shed all of their skin in one big piece. Others, like most lizards, shed their skin in patches.

There are around 6500 different species of reptiles. **Herpetologists** (people that study reptiles and amphibians) usually separate these species into four main groups: crocodilians, snakes, lizards, and turtles.

Vocabulary

Reptile – an ectothermic (cold-blooded) vertebrate that has a covering of scales and reproduces on land
Ectothermic – having an internal body temperature that changes in accordance with the temperature of the surroundings
Scales – dry, plate-like skin covering
Crocodilian – large semi-aquatic reptile, including crocodiles, alligators, caimans, and gharials
Turtle – reptile with a hard shell and toothless jaws
Tortoise – type of turtle that lives on land and has thick trunk-like legs
Snake – legless reptile with a long cylindrical body
Lizard – reptile that usually has an elongated body, four legs, moveable eyelids, and a long tail
Herpetologist – person that studies reptiles and amphibians
Venom – toxin that is produced by an animal and injected by a bite or sting
Carapace – shell that covers the back of a turtle
Plastron – shell that covers the bottom of a turtle
Oviparous – producing eggs that hatch after laying
Ovoviviparous – producing eggs that hatch within the body
Viviparous – giving birth to live young that develop within the mother's body
Jacobson's organ – chemosensory organ located in the roof of the mouth
Nictitating membrane – transparent inner eyelid

Crocodilians: Crocodilians are large semi-aquatic reptiles, including crocodiles, alligators, caimans, and gharials. They can be found in aquatic habitats throughout warm areas of Asia, Australia, North America, South America, and Africa. There are twenty-three species of crocodilians, and all are carnivorous. They have 60-110 (depending on the species) sharp conical teeth that can be replaced as many times as needed. Crocodilians use these teeth for catching their **prey** and ripping it into bite-sized pieces, but not for chewing—they swallow their food whole. To protect their eyes underwater, crocodilians have an extra transparent eyelid called the **nictitating membrane**, which moves horizontally across their eyes. Crocodilians are capable of walking around on land, but they are much more agile in the water, where they use their powerful tail to propel them. The smallest crocodilian is the Dwarf Caiman, which only grows to 3 or 4 feet, and the largest is the Saltwater Crocodile, which can grow to over 20 feet.

Turtles and tortoises: Turtles stand out from other reptiles because of their hard protective shells. These shells are made of bony plates that extend from the spine and ribs and are usually covered in hard scales called **scutes**. The upper half of a turtle's shell is called the **carapace** and the lower half is called the **plastron**. Turtles and tortoises live in temperate and tropical climates all over the world in almost any type of habitat. Many turtles are adapted for spending much of their time in the water. They often have low, flat shells and webbed feet. Turtles that live in the water are usually carnivores (meat eaters) or omnivores (plant and meat eaters). Members of the tortoise family live on land and most are herbivores (plant eaters). They usually have a high domed shell and thick trunk-like legs for moving around on land rather than swimming through water. Turtles do not have teeth, but they use their sharp beak for biting and tearing their food.

Snakes: Snakes have long limbless bodies ranging from only a few inches long to over 30 feet. Since they have no arms or legs, snakes move by pushing their belly scales against the surface they are moving across. All snakes can swim and many are also excellent climbers. Snakes are carnivorous and have flexible jaws that allow them to open their mouths wide enough to swallow their prey whole. Some types of snakes kill their prey by injecting **venom** into it, but most are non-venomous. Many snakes use constriction to kill their prey. These snakes catch an animal and then wrap their body around it. Every time the animal exhales, the snake squeezes its body tighter until the animal suffocates. Unlike most lizards, snakes do not have external ears, but they are able to sense vibrations through a bone in their head. Some snakes, like rattlesnakes and cottonmouths, can also sense heat through special receptors between their eyes and nostrils. To smell its surroundings, a snake flicks its forked tongue out of its mouth to collect air particles. When it pulls its tongue back into its mouth, it touches a special organ on the roof of its mouth, called the **Jacobson's organ**, which senses the smells brought in on the tongue.

Lizards: Snakes and lizards are closely related and are actually part of the same scientific order (Squamata). Most lizards have four legs, but there are a few species, such as glass lizards, that do not have any legs. Like snakes, lizards smell their surroundings with their tongues. Some lizards have forked tongues that flick in and out of their mouths just like snakes, while others have long sticky tongues that they use for catching bugs. Lizards have many different types of defensive adaptations. Some can move very quickly—the six-lined racerunner holds the record for the fastest speed reached by a reptile on land at 18 mph. Others, like anoles and geckos, can also allow their tail to fall off to distract a predator while they run for safety. They will then grow a new tail to replace the one they lost. Some lizards have even more unusual defenses, like sticking out a blue tongue (blue-tongued skinks), or squirting blood from their eyes (horned lizards).Two species of lizards (Gila monsters and beaded lizards) can even use venom as a defense.

Procedure (as presented by zoo instructor):

- Introduction (5 minutes)
- Define reptiles and subcategories using visual aids (5 minutes)
- Give examples of reptile groups and characteristics using hands-on animal interaction and biofacts (20 minutes)
- Check for comprehension (5 minutes)
- Allow for questions (5 minutes)

Evaluation: The zoo instructor will continually check for comprehension throughout the lesson by asking questions and reinforcing ideas.