



SCIENCE ACTIVITY BOOK

Learning About

REPTILES

- Herpetology • Dinosaurs • Reproduction • Classification • Behavior • Adaptations
- Conservation • Research • Vocabulary • Observation Activities and More!

Animal Life Series



By Debbie Routh

Mark Twain Media/Carson-Dellosa Publishing Company, Inc.

Grades
4 - 8 +

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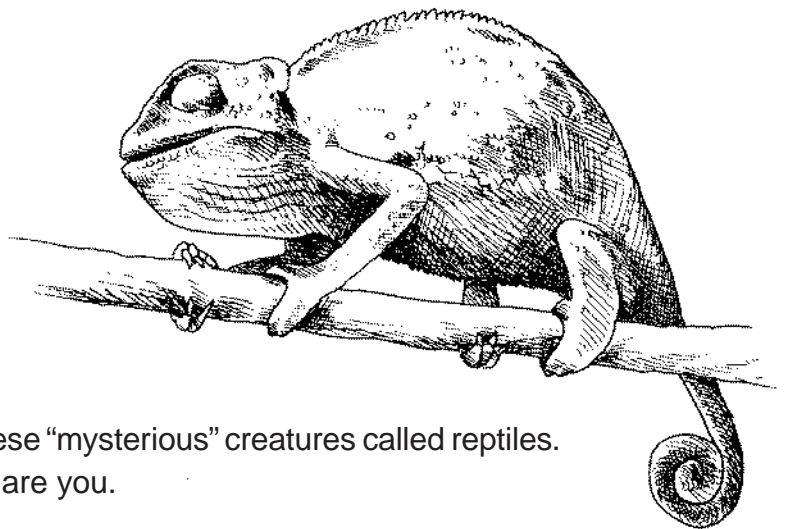
Introduction

Welcome to a series of books devoted to the *Chordata* phyla. A **chordate** is an animal that has a spinal cord and **vertebrae** (backbone). every animal in the animal kingdom can be subdivided into two main groups. the invertebrates (without a backbone) make up 95 percent of all the known animals. the vertebrates (with a backbone) make up only five percent of the animal kingdom. the vertebrates are then subdivided even further into seven classes: the three classes of fish, amphibians, reptiles, birds, and mammals.

this book is devoted to the special group of vertebrates called **reptiles**. People have their own ideas about reptiles. Some of these ideas are false. have you ever held a snake or a lizard in your hand? Snakes, for example, are not slimy, and most aren't really dangerous. Some reptiles, such as the ancient dinosaurs, fascinate people. the goal of this book is to introduce you to reptiles. unfortunately, reptiles are often the animals people love to hate.

Reptiles live in various **habitats** (where they live) and are a **diversified** (having different characteristics) class of vertebrates. they are varied in their structures because they must be well suited to their environments; otherwise, they could not survive where they live. Reptiles may be very diversified, but they still have many traits or characteristics in common. Reptiles are **ectothermic** (cold-blooded) vertebrates with dry, scaly skin. the class *reptilia* includes lizards, snakes, turtles, crocodiles, and alligators, as well as the tuatara and the extinct dinosaurs.

Student observers will use many scientific process skills throughout this animal life series. the reinforcement sheets that follow the lessons contain at least one higher-level thinking question. So, student observers, put on those thinking caps and use your process skills to observe, classify, analyze, debate, design, and report. t his unit contains a variety of lessons that will help you practice scientific processes as you make exciting discoveries about these "mysterious" creatures called reptiles. they are a part of our living world and so are you.



* t eacher Note: each lesson opens with a manageable amount of text for the student to read. the succeeding pages contain exercises and illustrations that are varied and plentiful. Phonetic spellings and simple definitions for terms are also included to assist the student. the lessons may be used as a complete unit for the entire class or as supplemental material for the reluctant learner. the tone of the book is informal; a dialogue is established between the book and the student.

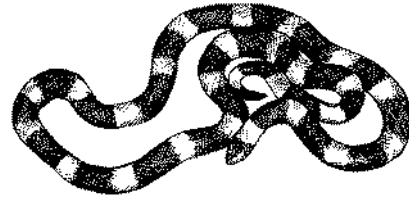
What Is a Reptile?: *Members, Habitats, and Characteristics*

Kingdom: *Animalia*

Phylum: *Chordata*

Subphylum: *Vertebrata*

Class: *Reptilia* (rep tiL ee uh)



hello, student observers! Are you ready to learn the facts about an amazing group of animals called reptiles? Reptiles make up a class of vertebrates that are more complex than amphibians. Reptiles are well adapted to life on land. they were the first vertebrates that did not need to live in water for at least part of their lives. the name *reptilia* means “creepers.” i wonder where that idea came from?

the world was once full of giant reptiles called dinosaurs. this time period, the Mesozoic era, was called the age of the dinosaurs. We know they lived and ruled the land during this time because their remains or imprints have been found in rocks. these are called **fossils**. the dinosaurs are all extinct now, but four of the 16 major groups of reptiles have relatives alive today. there are about 6,500 different species of reptiles. they include turtles and tortoises, alligators and crocodiles, lizards and snakes, and a small group called tuataras (too uh t AY ruhs).

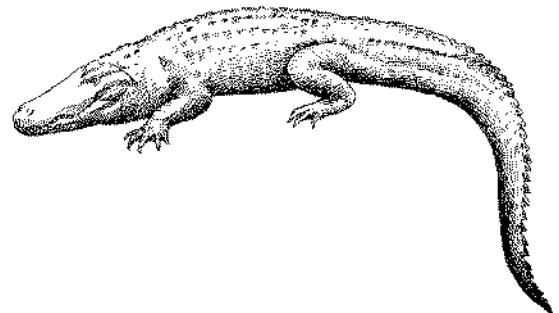
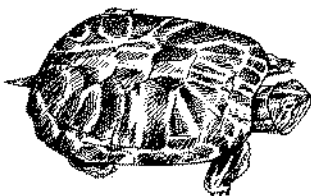
Reptiles today can be found on land, in fresh water, in brackish (slightly salty) water, and in seawater. these reptiles may vary in their appearance, but they share a number of important characteristics or features.



Reptile Characteristics

All reptiles are **vertebrates**—they have a bony skeleton that supports and shapes their bodies. Reptiles are **ectothermic** (cold-blooded). their temperature depends on that of their surroundings. Reptiles cannot tolerate the cold; that’s why you see snakes or lizards basking in the sun. one of the major problems faced by land animals is **dehydration** (drying out). As you can see, observers, reptiles have several adaptations to help them overcome this problem.

- Reptiles have dry skin covered with protective scales or plates to keep them from drying out. their scales are made of a hard material similar to human fingernails.
- Most reptiles have two pairs of short legs with clawed feet; snakes are the exception.
- Reptiles usually lay eggs on land. the eggs have a leathery or hard shell and yolk (food) to feed the embryo. the shelled egg was a big step in vertebrate life. it enabled them to spread throughout the land.
- Reptiles use lungs to breathe oxygen from the air.
- Reptiles have a three- or four-chambered heart.



Name: _____ Date: _____

What Is a Reptile?: Reinforcement Activity

To the student observer: What is a reptile? _____

Analyze: if the tuataras are called "living fossils," what do you think this means? _____

i. Solve the puzzle below:

R _____

_____ e _____

_____ p _____

_____ t _____

_____ i _____

_____ l _____

_____ e _____

_____ s _____

Dinosaurs are ancient _____ of reptiles.

_____ is a major problem for land animals.

_____ are more complex than amphibians.

All reptiles are _____.

there are 6,500 _____ of reptiles.

A _____ animal's temperature depends on its surroundings.

Reptiles are _____ or cold-blooded.

the "living fossils" are the _____.

ii. Complete the following sentences.

1. Reptiles are land animals that lay _____.
2. the embryo developing inside the egg is nourished by the _____.
3. the name *reptilia* means _____.
4. Reptiles use _____ to breathe.
5. _____ evidence proves dinosaurs lived a long time ago.

iii. Answer the following questions.

1. What are the four groups of reptiles today?
 - a. _____
 - b. _____
 - c. _____
 - d. _____
2. What are the four main characteristics of reptiles?
 - a. _____
 - b. _____
 - c. _____
 - d. _____

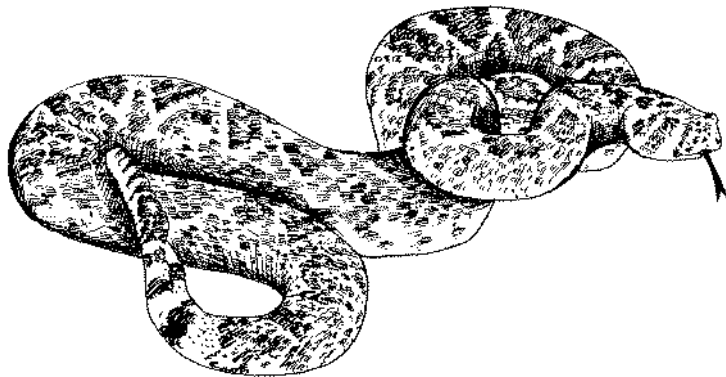
Herpetology: *Crawling Things*

Scientists once thought amphibians and reptiles were closely related, so they classified (grouped) them together. Scientists today realize they look very much alike on the outside, but inside they are very different. Scientists have studied live specimens and dissections of both classes. Because of these studies, we now know amphibians are not reptiles. **Amphibians** have no scales, breathe through their moist skin, and need to return to water to lay their unprotected eggs. they also discovered that amphibians develop differently; they must go through metamorphosis. **Metamorphosis** is a change in development as the young amphibian grows to become an adult. When reptiles hatch, they look exactly like their parents.

Both classes are vertebrates. t hey are both **ectothermic** (cold-blooded) and must obtain heat from outside sources. t hey must move to warmer or cooler surroundings as the need arises. ectothermic animals have an advantage over **endothermic** (warm-blooded) animals because they do not have to maintain a constant body temperature for their survival. this allows reptiles to be able to go long periods of time between meals.

in some cold climates, the reptile adjusts to its surroundings by hibernating. the state of **hibernation** is when an animal's body slows down; the entire body becomes at rest. it will remain in this state and live off body fat until warmer conditions return. in some climates, such as the hot desert, a reptile may find the need to escape the extreme heat and dryness by **estivating**. this is very similar to hibernating except the animal finds a cool spot and slows down all bodily functions until cooler conditions return. A warm-blooded animal's body temperature remains constant no matter what the surrounding temperatures are like. it does not need to hibernate or estivate as a cold-blooded animal does.

Herpetology is a branch of science that deals with both the reptile and the amphibian. the name of this science comes from the Greek word, *herpeton*, which means, "crawling things." herpetologists study all aspects of reptiles and amphibians. they are very dedicated to the conservation and protection of these animals.



Name: _____ Date: _____

Herpetology: *Reinforcement Activity*

To the student observer: What is *herpetology*? _____

Analyze: Why do modern scientists believe reptiles and amphibians belong in different classes?

Directions: Answer the following questions.

1. Why were amphibians and reptiles originally grouped together? _____

2. What are ectothermic animals? _____

3. What are endothermic animals? _____

4. What advantage does a cold-blooded animal have over a warm-blooded animal?

5. What is hibernation? _____

6. What does it mean if an animal estivates? _____

7. What is metamorphosis? _____

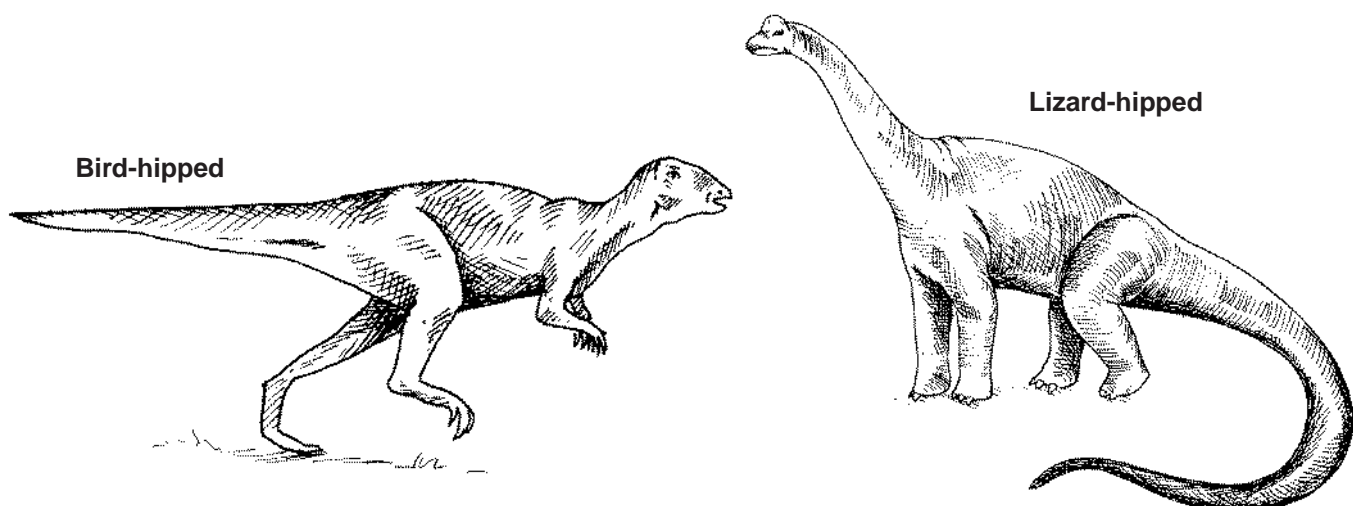
Dinosaurs: *Rulers of the Earth Long, Long Ago*

During the Carboniferous period, the land was covered with swamps and forests. At that time, the most famous reptiles roamed the earth and soon became the most abundant animals. These strange-looking monsters were probably not very intelligent; yet many of them were so big and strong they were able to settle in all parts of the world. How do we know so much about them? We have learned a great deal about them from the fossils **paleontologists** (people who study fossils) have discovered. **Fossils** are hardened remains or imprints of plant or animal life of a previous geologic period. Fossils may form when an organism's remains are preserved, when the remains turn to stone, or when the imprint of the remains or tracks are left in stone.

The word *dinosaur* comes from the Greek words meaning "terrible lizard." Dinosaurs came in all sizes and shapes. A few stood as tall as a building, while others were smaller than a chicken. Most dinosaurs were peaceful plant-eaters. The dinosaurs weren't the only animals on the earth. The dinosaurs coexisted with birds, lizards, and tiny shrew-like mammals.

The dinosaurs are divided into two main groups: the lizard-hipped group and the bird-hipped group. The **lizard-hipped** group contained the largest species. The **herbivore** (plant-eater), the Brontosaurus, and the **carnivore** (meat-eater), the Tyrannosaurus Rex, belonged to this group. The **bird-hipped** group seemed to be primarily herbivores. The Triceratops and the armor-plated Stegosaurus are examples of this group.

The dinosaurs all suddenly died out. Nobody knows for sure why this happened, but scientists have formed some different theories. Most agree that the climate changed and the weather became too cold for dinosaurs to survive. These environmental changes disrupted their food supply. Some believe an **asteroid** (a rock from space) hit the earth so hard that clouds of dust surrounded the planet, blocking out the sun's light. As a result, plant life declined. Some believe it was a slow decline in temperature over time as a result of landmasses drifting north due to the gradual loss of shallow seas. Others believe it was the large amounts of carbon dioxide gas from volcanoes that caused the mass extinction. Because they could eat organisms that depended on decaying plant material, the tiny lizards and mammals were able to survive these conditions. Their survival proves that the surface of the earth did not freeze. Today, since there are no records, there are still many debates over why the mass extinction occurred.



Name: _____ Date: _____

Dinosaurs: *Reinforcement Activity*

To the student observer: What happened to all the dinosaurs? _____

Analyze: Why didn't all the other animals die out with the dinosaurs? _____

Directions: Answer the following questions.

1. What are paleontologists? _____

2. What trait did scientists use to divide the dinosaurs into two main groups?

3. how does a fossil form? _____

4. What do most scientists believe caused the dinosaurs to become extinct?

5. Why is it that no one knows what happened to the dinosaurs?

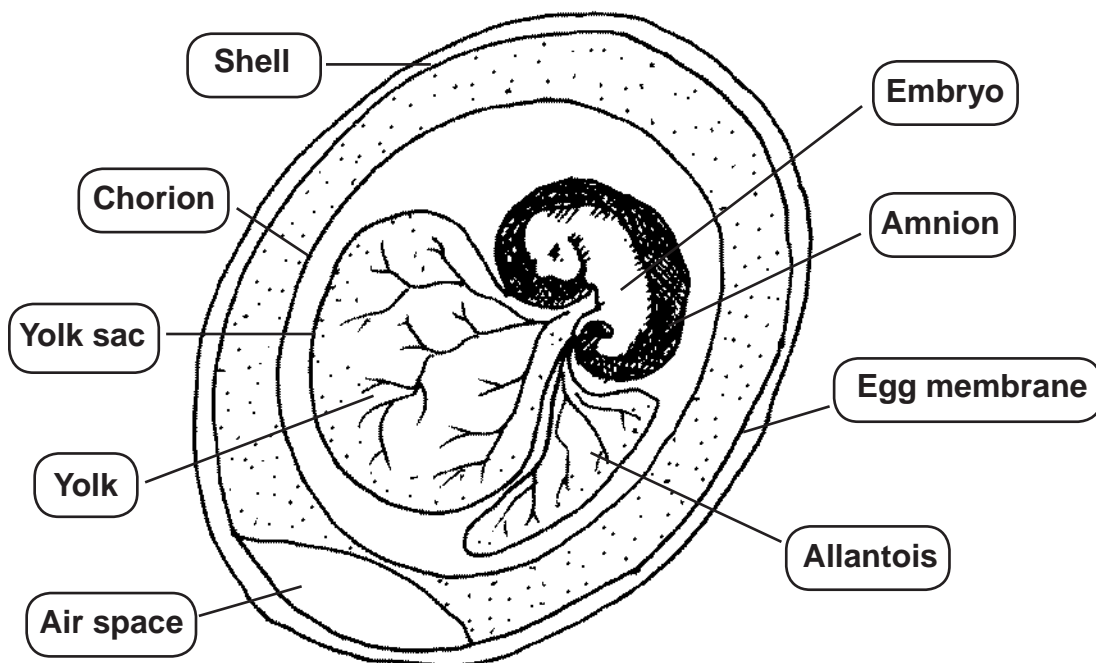
6. What does the word *dinosaur* mean, and from which language does it come?

Reptile Reproduction: "Eggciting" Development

Reptiles mate to produce more reptiles. Most reptiles lay eggs on land in a nest. Some reptiles, such as the boa constrictor, keep the eggs inside their bodies, and when the babies hatch, they are born alive. Another constrictor, the anaconda, often gives birth to many snakes at one time. Scientists have seen a 6 m (19 ft.) female anaconda give birth to 72 babies.

Reptile eggs may have hard shells like those of chicken eggs or softer, leathery shells. this is a wonderful adaptation for an animal that reproduces on land. unlike the eggs of most fish and amphibians, eggs of reptiles are fertilized inside the body of the female. After fertilization, the female's body secretes a shell around the egg. the mother then lays the egg in a nest made of plant material or mud. this protects the developing **embryo** (a developing organism) until it is fully-developed and ready to hatch. this type of egg, called an **amniotic egg**, has everything the embryo needs to finish developing. it contains four special kinds of membranes: the amnion, yolk sac, allantois, and chorion. the egg is named for the **amnion** (AM nee un), which surrounds the fluid in which the embryo floats, offering it protection. the **yolk sac** is a membrane that surrounds the yolk, which is the food supply for the embryo. the **allantois** (uh LAN toe is) stores waste produced by the embryo. the **chorion** (KoR ee un) lines the outer shell, enclosing the embryo, all the other membranes, and everything inside the shell. As you can see, this is a benefit for being able to reproduce on land.

the young developing reptile gets oxygen from small **pores** (holes) in the shell. Carbon dioxide is released in the same way. Predators eat many reptile eggs before they can hatch. Mammals, other reptiles, and raptors prey on reptile eggs. the baby reptiles break open the eggs using an **egg tooth**. the egg tooth dries up and falls off shortly after hatching. the young reptile is called a **hatchling**. Most reptiles do not look after their young. the hatchlings are able to care for themselves immediately.



Name: _____ Date: _____

Reptile Reproduction: *Reinforcement Activity*

To the student observer: What are the advantages of the amniotic egg? _____

i. Answer the following questions.

1. What is the function of the shelled egg? _____

2. What is an amniotic egg? _____

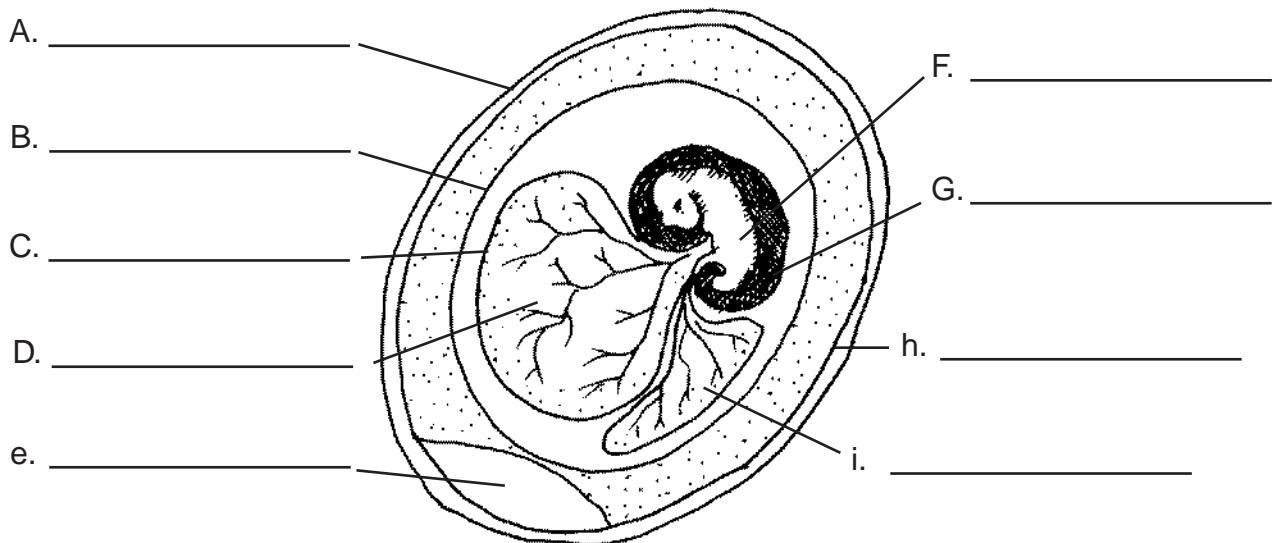
3. What is the purpose of the yolk? _____

4. What surrounds the floating embryo? _____

5. how does oxygen enter the egg? _____

6. What are young reptiles called? _____

ii. identify the parts of the reptile egg below.



Classification: *Keeping Track of Happy Families*

Reptiles, like all living things, are **classified** (placed into groups), which makes it easier to learn about them. Classification (klas uh fi KAY shun) of animals is based on common ancestors. Animals are classified in the same way that you are related to your brothers and sisters because you share the same parents and in the same way you are related to your cousins because you share the same grandparents. Scientists divide animals into the same family groups according to their common ancestors. Classification is a way of organizing and communicating information about the different kinds of living things, of avoiding mistakes in communication, and giving scientists a logical process to identify newly-discovered organisms.

Scientists have identified over 6,000 species of reptiles. it is difficult to keep track of all the different kinds of **organisms** (living things) that have been discovered so far; each year the list gets longer. in a library, you can find a book quickly because the books have been classified by subject. Grouping things according to their similarities is called **classification**. the science of classification is called **taxonomy** (tacks oN uh mee). taxonomy is a very complex science because taxonomists do not group organisms together simply because they look alike. they also study their cells, the way they grow and develop, their blood, and their internal structures.

Reptile Groups

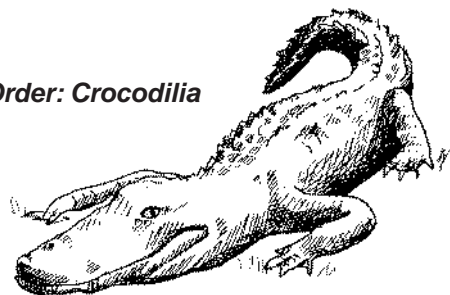
Scientists have divided reptiles into four main groups:

- Lizards and snakes make up the largest and most varied order called *Squamata*. the main difference between these kinds of reptiles is that snakes do not have legs.
- turtles and tortoises belong to the order of reptiles with shells called *Chelonia*. (keh Loh nee uh).
- Crocodiles and alligators belong to the order of *Crocodylia*. they have tails and spend much of their time in water.
- the tuatara is in the smallest order, its own group called *Rhynchocephalia* (ring koh she FAY lee uh). Members of this group still have many of the features of ancient reptiles.

Order: *Squamata*



Order: *Crocodylia*



Order: *Chelonia*



Order: *Rhynchocephalia*

