



## Reptilian Requirements

Created by the North Carolina Aquarium at Fort Fisher Education Section

### Essential Question:

What physical and behavioral adaptations do North Carolina reptile species possess?

### Lesson Overview:

As a class, you will discuss adaptations in the context of familiar animals such as family pets and classify those adaptations as physical or behavioral. Students then research individual reptiles, listing their adaptations, and compare those adaptations to those of the reptile researched by another student using Venn Diagrams.

### Learning Objectives:

Students understand the difference between physical and behavioral adaptations and can classify these differences in North Carolina reptile species. Students will be able to:

- Predict what adaptations certain animals need.
- Use reading skills to identify adaptations.
- Create a Venn diagram to determine adaptations reptiles share.

### North Carolina Standards:

#### Fourth Grade:

##### *Science:*

- **4.L.1** Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.
  - **4.L.1.2** Explain how animals meet their needs by using behaviors in response to information received from the environment

##### *Technology:*

- **4.SI.1** Apply criteria to determine appropriate information resources for specific topics and purposes.
  - **4.SI.1.2** Use relevant sources of information for an assigned task.
  - **4.SI.1.3** Use reliable sources of information
- **4.IN.1** Apply appropriate strategies when reading for enjoyment and for information.
  - **4.IN.1.1** Implement appropriate reading strategies when reading for information.
- **4.TT.1** Use technology tools and skills to reinforce classroom concepts and activities.
  - **4.TT.1.1** Use a variety of technology tools to gather data and information (e.g., Web-based resources, e-books, online communication tools, etc.).
- **4.RP.1** Apply a research process as part of collaborative research.
  - **4.RP.1.1** Implement a research process by collaborating effectively with other students.



### Time Frame:

Preparation: 30 minutes

Activity: 40 minutes

Discussion: 10 minutes

### Materials:

- Computers or tablets with internet access (or printed animal profiles)
- Classroom board
- Notebook paper
- Pencils

### Preparation:

Visit <http://www.ncaquariums.com/fort-fisher/teachersstudents> and access the aquarium's digital field guides. Assign each student a reptile from the field guides.

Potential animals include:

- American alligator
- Black rat snake
- Copperhead
- Diamondback terrapin
- Eastern box turtle
- Eastern cottonmouth
- Eastern diamondback rattlesnake
- Green sea turtle
- Loggerhead sea turtle
- Red corn snake
- Rough green snake
- Spotted turtle
- Timber rattlesnake
- Yellow rat snake

### Supplemental Background Information for Teachers:

Reptiles are a group of animals known for having scaly skin, being cold blooded (ectothermic), and laying eggs. Most reptiles also have claws. All reptiles breathe using lungs. Since their skin is covered in scales, all reptiles must periodically shed their skin as they grow. This also helps to remove parasites. Since reptiles are ectothermic, they spend much of their time lying in the sun to warm their body temperature. That is why many of our reptiles do not frequently move. Reptiles must bring their body temperature up to properly digest their food. Because of this, reptiles at the Aquarium get fed less frequently in the winter than the summer. Reptiles can be carnivores, omnivores, or herbivores. Reptile eggs are soft and leathery to protect them from breakage. Some reptiles are ovoviviparous and hold the eggs within their body rather than laying them in a nest. Some reptiles, such as alligators, guard their nests, whereas others simply lay their eggs and move on. Some turtles even lay their eggs in alligator nests so that the alligator will guard their eggs.

The four major groups of reptiles can be remembered using the word LAST: lizards, alligators and crocodiles, snakes, and turtles/tortoises/terrapins (*chelonians*).

- *Chelonians* are the oldest living group of reptiles.



- The order *Crocodylia*, which includes alligators, caimans, crocodiles, and gavials, are large, carnivorous reptiles of tropical and subtropical swamps and rivers. They constitute the only remaining order of the great reptilian subclass *Archosauria*, or ruling reptiles, which includes the extinct dinosaurs.
- Snakes and lizards are found in the same order and are some of the more modern reptiles. Most snakes and lizards are terrestrial, although there are a few exceptions, such as sea kraits and marine iguanas.
- There is another type of reptile that is the only animal in its order: the tuatara which is a lizard-type animal that lives in New Zealand.

### Procedure:

1. Have the students raise their hands if they have a pet. As a class, create a list on the board of all of their pets.
2. Discuss adaptations of the domestic animals through questions and answers. Examples of questions can include: “How does your dog keep from getting too hot in the summer?” (Answers: panting, shedding fur, finding a shady spot, going for a swim). Explain that these responses are adaptations.
3. Write the word “adaptation” on the board and create a definition as a class.
4. Discuss how adaptations help an animal survive in its habitat (i.e. fish live in water and their gills allow them to breathe underwater).
5. Ask the students which of the adaptations they listed for their pets are behavioral (finding shade, swimming) and which are physical (panting, shedding).
6. Ask students to brainstorm about general adaptations reptiles might have. Create a new list of reptile adaptations.
7. Assign each student a reptile from the list above to research.
8. Have the students access the information for their reptile from the NC Aquarium at Fort Fisher’s Encyclopedia of Life Field Guide. They should use the vocabulary sheet to identify words they don’t understand.
9. Each student should create a list of the physical and behavioral adaptations for their animal.
10. On the board, create a table. List the animals in rows in the first column. Behavioral adaptations will be written in the second column and physical adaptations in the third.
11. Have the students add their adaptations to the table on the board.
12. Help identify adaptations they might have missed.
13. Have each student draw a Venn diagram on their paper. They should choose two animals to compare.
14. The students should use the list of adaptations on the board to complete their Venn diagram.
15. Have the students share their diagrams.



### Final Activities:

Facilitate discussion about the following:

- Why are some adaptations shared, while others are not?
- What are some examples of other animals in North Carolina that have adaptations similar to the reptiles listed?
- Does an understanding of adaptations influence students' perception of some animals, such as venomous snakes and snapping turtles?

### Extensions:

1. Have students research and compare reptiles to other groups of animals, like amphibians, birds, or mammals.
2. Have students compare groups in a Venn diagram and discuss similarities and differences.
3. Visit the aquarium and have the students find their assigned reptile. Observe their physical and behavioral adaptations.
4. Reptiles are found on every continent except Antarctica. There is a new citizen science program dedicated to mapping reptiles and amphibians on the planet. This is called HerpMapper: <http://www.herpmapper.org/>. Your students can use their computers or smart phones to upload photos of reptiles and amphibians they see in the wild.

### Resources:

Amphibians and Reptiles of North Carolina: <http://www.herpsofnc.org/>

NC Wildlife Species Fact Sheets: <http://www.ncwildlife.org/Learning/Species.aspx>.



## Vocabulary:

**Adaptation:** Modification of an organism or its parts that makes it more fit for existence under the conditions of its environment.

Context: The American alligator has a membrane that covers its eye when it is underwater. This **adaptation** allows the alligator to see when it is submerged.

**Caudal:** Relating to or in the position of the tail.

Context: The **caudal** section of lizards can detach, allowing them to escape from predators.

**Camouflage:** A disguise resulting from an organism having coloration similar to that of the background, or markings that cause breaking of the outline, so that the organism blends into the background and is hidden from predators.

Context: An alligator is so well **camouflaged** that you could walk by one without ever seeing it.

**Cold-blooded:** Having a body temperature close to that of the environment.

Context: Turtles often come out to bask in the sun. Because turtles are **cold-blooded**, they need to get warmth from the environment.

**Hema-toxic venom:** Venom that attacks the red blood cells of an animal.

Context: The **hema-toxic venom** of the copperhead snake prevents prey from escaping once bitten.

**Reptile:** Any of a group of cold-blooded, air-breathing vertebrates that usually lay eggs and have skin covered with scales or bony plates.

Context: Because sea turtles are **reptiles**, they lay their eggs on land.

**Scale:** Any of the small, stiff, flat plates that form an outer covering on the body of some animals, especially fish and reptiles.

Context: Most reptiles are covered with horny **scales** or plates that protect their bodies from drying out.

**Venomous:** Any animal that possesses a substance capable of being injected into, and harming, another animal.

Context: There are six species of **venomous** snakes in North Carolina.

**Vertebrate:** Having a spinal column.

Context: Reptiles are **vertebrates**; they have an internal skeleton with a central backbone.