TLC Online Curriculum

Lesson Title:
Reptile Adaptations

Grade level:
4-5

Subject Area:
Animals

Duration:
Two or three class periods

Objectives:

Students will understand the following:
1. Adaptation describes the changing traits that enable reptiles to live in their environments.
2. Adaptations can be found in physical and behavioral traits of reptiles. Snakes and lizards, turtles, crocodilians, and the tuatara constitute the living orders of reptiles.

Materials
- Chalkboard or chart paper
- Marker
- Internet access
- Printer
- Classroom Worksheet: Reptile Research
- Take Home Worksheet: Reptile Crossword
- Research resources (e.g., Internet, CD-ROMs, encyclopedia, etc.)
- Construction paper
- Pencil

Procedures
1. Share an amazing fact with students: At one time, giraffes came in a variety of neck lengths. Some giraffes had much shorter necks than modern giraffes. Ask students to brainstorm why short-necked giraffes did not survive. Then offer an explanation of natural selection:

   The giraffes with shorter necks couldn't compete with long-necked giraffes. Explain that the giraffes were not in an actual contest that they could win by changing their physical characteristics or behavior; they were unknowing participants in a competition that takes place every day in nature: Food supplies are limited so animals must compete for them with other species and like animals. Unlike the giraffes with long necks, short-necked giraffes couldn't reach leaves and twigs up high as well as the ones closer to the ground. Because many animals

could eat the low-lying vegetation, fewer short-necked giraffes got enough to eat. Over generations, giraffes with longer necks grew stronger and healthier. The long-necked giraffes had more and more babies that, like their parents, inherited long necks and were better able to survive when food was scarce; no other animal could reach the high leaves as well as they could. Over time, more and more short-necked giraffes died before they could reproduce more short-necked babies. Eventually, only long-necked giraffes were born. This process of change, called "natural selection," happens in all species.

2. Explain that a giraffe's long neck is an **adaptation**, a trait that helps it fit in and survive in its environment. Tell students that sometimes different species within the same family have very different adaptations that depend on location. For example, the Siberian tiger has striped fur while the snow leopard sports a white and black coat. These adaptations allow each species of cat to meet the challenges of its different environment. The Siberian tiger's striped fur keeps it disguised in the dense forest of China; the snow leopard's white fur helps it hide in its snowy environment.
3. On the chalkboard or chart paper make three columns. Label the first column "Animal," the second column "Adaptation," and the third column "Effect." Fill in the first two columns with some sample animals and their adaptations. Then, ask students the effect of each animal's adaptation. Encourage students to add their own ideas to the list. Here are a few examples to start the list:

Animal	Adaptation	Effect
Giraffe	Long neck	Can eat leaves in tall trees (the parts of plants other animals can't reach)
Bird	Flies south in winter	Warmth
Porcupine	Sharp, stiff quills	Can defend itself against enemies
Chipmunk	Hibernate	Can avoid winter food shortages
Dolphin	Tail	Helps it swim

4. Point out the two types of adaptations: physical and behavioral. A polar bear's thick fur, which protects it from the cold, is an example of a physical adaptation. A lizard that "plays dead" to avoid predators is displaying a behavioral adaptation.
5. Invite students to review the adaptations discussed earlier and identify each as either behavioral or physical.
6. Ask students to brainstorm about reptiles, noting their responses on the chalkboard. Add the following traits to the list if the students haven't already (or circle them if they're already on the list), explaining that these are definitive traits of all reptiles:
    - breathe through lungs,
    - have an internal skeleton with a central backbone (vertebrate),

- are cold-blooded (body temperature is directly related to its surroundings).

7. Explain to the class that reptiles have been living on Earth for over 300 million years. They've been able to survive because of specific traits, both physical and behavioral, that enable them to live in their environments. Then, introduce students to the following types of living reptile with these fun facts:
    - Turtles spend most of their lives in the water and have plated shells covering their bodies.
    - Lizards have great vision and use their tongues to taste their surroundings.
    - Crocodiles lose their teeth chomping on prey, but new sets always grow in.
    - Snakes can go a long time without eating, but when they do, their meal is usually another animal.
    - The tuatara is similar to a lizard, but the tuatara has a third eye and an extra row of teeth.
8. Divide the class into groups of two or three students. Assign each group one of the following reptiles to research: snapping turtle, rattlesnake, iguana, American alligator, chameleon, tuatara, sea turtle, python, Nile crocodile. You might allow them to select a different reptile of their own choice.
9. Print out and distribute the Classroom Worksheet: Reptile Research to help guide students' research. They will be creating a description of the reptile including what it looks like, where it lives, what it eats, what eats it, and its adaptations.
10. When groups complete their research, instruct them to make a diagram of their reptile with labeled descriptions of the animal's adaptations. Be sure they draw lines from the illustration to each description. If necessary, show models of other types of diagrams.
11. As a fun homework assignment, distribute the Take-Home Worksheet: Reptile Crossword. This short puzzle is a great vocabulary review for students after they have completed the lesson.

Adaptations for younger students

Instead of dividing the children into groups, present to the class pictures of different reptiles, such as a snake, a turtle, a crocodile, and a lizard. Describe to students where the reptile lives, what it eats, what eats it, and some of its adaptations. Then, have students brainstorm ways each adaptation helps that reptile survive.

Discussion Questions

1. Reptiles have both physical and behavioral adaptations that help them survive in their habitats over time. Name one physical adaptation and one behavioral adaptation from the reptiles you studied.
2. The tuatara is the oldest living reptile. What types of adaptations have enabled this reptile to outlive so many other reptiles?
3. Why do some consider dinosaurs the "original reptiles"? What traits do they share with other reptiles?

4. Almost all reptiles have dry, scaly skin. Think about where most reptiles live, then brainstorm some of the reasons for their skin characteristics.
5. Do a little research on crocodiles and alligators. Why are they both considered reptiles? How are they different from each other?
6. All reptiles are cold-blooded; that is, their body temperature stays about the same as the temperature of their surroundings. What adaptations do reptiles have, both behavioral and physical, that help them survive as cold-blooded creatures?

Evaluation

You can evaluate your students on their research and diagrams using the following three-point rubric:

- Three points: research report includes a thorough and well-written description of the reptile including what it looks like, its preys, its predators, and a description of two or more adaptations and how they have helped the animal survive; the accompanying diagram is labeled accurately and includes thorough descriptions of the reptile's various features and adaptations

- Two points: research report is adequate and includes some description of the reptile and an explanation of at least one of the animal's adaptations; the diagram is partially labeled with some description of the labeled parts

- One point: little research was completed, and descriptions are poorly written; no adaptations are described, or they are described incorrectly; diagram is sketchy and does not included labels with descriptions.

You can ask students to contribute to the assessment rubric by determining criteria for well-written research reports and diagrams.

Extensions

Comparing Reptiles
Invite students to work in groups of two or three to create a Venn-like diagram comparing and contrasting different reptiles. How are snakes different from lizards? How are they the same? What are the differences between a crocodile and an alligator? What adaptations do they share?

Ancient Reptiles
The first reptiles appeared over 300 million years ago. One of the most spectacular reptiles—the dinosaur—died out about 65 million years ago. Invite students to research an extinct reptile and describe its adaptations. Encourage them to speculate about why this creature died out.

Reptile Models
Divide children into groups of two or three, and invite them to construct a model of a reptile of their choice. The model, which can be made of clay, play dough, papier-

mâché, or any other material, should clearly illustrate one or more of the animal's physical adaptations.

Suggested Readings:

Outside and Inside Snakes
Sandra Markle, Athenaeum Books for Young Readers, 1995.
Outstanding photographs show snakes in their environment - hatching, hunting, eating, and fighting - and their inside structures - bones, teeth, and internal organs. The engaging, informative text describes how behavior and physical characteristics make a snake ... a snake.

Alligators and Crocodiles
Karen Dudley, Raintree Steck-Vaughn, 1998.
This book is an excellent introduction to the crocodilians, providing information about the physical characteristics, life cycle, behavior, and social organization of alligators and crocodiles. It also describes crocodilians' adaptation to their environment and how they interact with other animals and humans.

National Audubon Society First Field Guide: Reptiles
John L. Behler, Scholastic, 1999.
This field guide includes a substantial introduction to reptile anatomy, behavior, adaptation, and habitat. Included is an identification guide to over 150 species of reptiles with photographs, descriptions, and range maps for each.

Web Links:

The Birmingham Zoo Animal Omnibus
Click on "Reptiles" for links to pictures of as many of the species as you can imagine.
http://www.birminghamzoo.com/ao/

Melissa Kaplan's Herp Care Information Collection
All you would ever want to know about herp care, plus some great resources for teachers and students.
http://www.sonic.net/melissk/index.html

Reptiles: Sedgewick County Zoo
This site offers photos and additional information about the physical characteristics, diet, behavior, and environmental status of over 30 reptiles.
http://www.scz.org/animals/reptiles.html

Reptiles: San Diego Natural History Museum
What is a reptile? And what isn't? Learn the answers here along with other frequently asked questions and answers about reptiles.
http://www.sdnhm.org/exhibits/reptiles/index.html

Vocabulary

Click on any of the vocabulary words below to hear them pronounced and used in a sentence.

Adaptation
Definition: Modification of an organism or its parts that makes it more fit for existence under the conditions of its environment.
Context: The African lizard's flat body is an adaptation that enables the reptile to fit into small crevices when threatened by a predator.

Cold-blooded
Definition: Having a body temperature close to that of the environment.
Context: The cold-blooded crocodile needs to sit in the sun to warm up.

Reptile
Definition: Any of a group of cold-blooded, air-breathing vertebrates that usually lay eggs and have skin covered with scales or bony plates.
Context: The reptiles, or class Reptilia, include turtles, crocodilians, the tuatara, and lizards and snakes.

Scale
Definition: 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.

Vertebrate
Definition: Having a spinal column.
Context: Reptiles are vertebrates; they have an internal skeleton with a central backbone.

Academic Standards

Grade level:
3-5
Subject area:
Science
Standard:
Understands how species depend on one another and on the environment for survival.
Benchmark:
Knows that an organism's patterns of behavior are related to the nature of that organism's environment (e.g., kinds and numbers of other organisms present; availability of food and resources; physical characteristics of the environment).

Grade level:
3-5
Subject area:
Science
Standard:
Understands how species depend on one another and on the environment for survival.
Benchmark:
Knows that changes in the environment can have different effects on different organisms (e.g., some organisms move in, others move out; some organisms survive and reproduce, others die)

Credit
Jackie Glassman is a freelance writer and editor of educational material.

DiscoverySchool.com
http://www.discoveryschool.com

Classroom Activity Sheet: **Scales to Tales**

Name: _____

Reptile Research

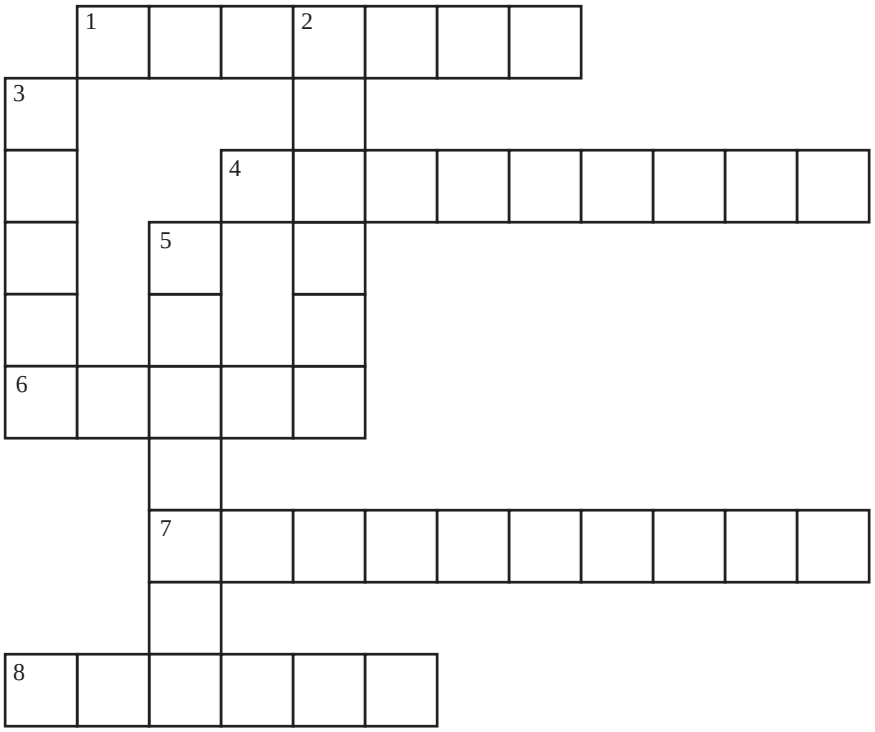
Reptile: _____

What it looks like	Where it lives	What it eats (prey)	What it looks like	Adaptations (include at least two)

Take-Home Activity Sheet: **Scales to Tales**

Name: _____

Reptile Crossword



Across

1. Turtles, crocodilians, tuataras, lizards, and snakes make up this class of animal.
4. This reptile loses its teeth chomping on predators.
6. It is has no legs, has 400 vertebrate, and moves with a slithering motion.
7. A trait that helps an animal to survive in its environment.
8. A reptile's skin is covered with these.

Down

2. This reptile spends most of its life in the water.
3. All reptiles breathe through these.
5. This very old reptile has a third eye and an extra row of teeth.