

# CREATE A CREATURE: ANIMAL ADAPTATIONS

Students learn that animals undergo adaptations—changes to body parts and behaviors—that help them survive. In Activity 1, students learn how scientists name all living things—including animals and plants that lived in prehistoric times. In Activity 2, students investigate adaptations in modern and prehistoric animals. In the Closing Activity, students apply what they have learned to produce a drawing, a description, and a correctly named imaginary prehistoric sea creature.

**Vocabulary** (see Glossary)

adaptation	<i>ops</i>
behavior	<i>ped or pes</i>
<i>bi</i>	<i>rex</i>
<i>cephal(o)</i>	<i>rhino</i>
<i>cerat(o)</i>	<i>saur(us)</i>
<i>ichthy</i>	<i>tri</i>
<i>mega</i>	<i>tyrann</i>
<i>micro</i>	<i>uni</i>
<i>odon or oden</i>	<i>vor(e)</i>

## Try This First!

**Tell students to write “marine reptile” on a piece of paper and then put their pencils down. Then have them try again, this time without using their thumb to grip the pencil. Point out that the thumb is a body part that provides an advantage when using a tool. Explain that writing and spelling words are learned behaviors. Both the thumb and the writing are examples of adaptations.**

*Guiding Question:*

**What body parts and behaviors help animals adapt to their environment? What can scientific names tell us about animal adaptations?**

Activity	Objectives	Instructional Strategy	Materials
<p><b>ACTIVITY 1</b> What’s in a Name? 45 min.</p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>- Learn how Greek and Latin word parts are used to name an animal; and</li> <li>- Learn about the science rules and conventions for naming a new animal.</li> </ul>	<ul style="list-style-type: none"> <li>- Discussions</li> <li>- Large-group Instruction</li> </ul>	<ul style="list-style-type: none"> <li>- “Greek and Latin Words Parts” (optional; online only)</li> </ul>
<p><b>ACTIVITY 2</b> How Do Animals Adapt? 45 min.</p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>- Learn about the term “adaptation”;</li> <li>- Understand how adaptations—changes in body parts or behaviors—help animals survive; and</li> <li>- Identify different types of adaptations.</li> </ul>	<ul style="list-style-type: none"> <li>- Computer-assisted Instruction</li> <li>- Discussions</li> <li>- Large-group Instruction</li> </ul>	<ul style="list-style-type: none"> <li>- Internet or library resources</li> <li>- “Animal Adaptations”</li> </ul>
<p><b>CLOSING ACTIVITY</b> Design-a-Saurus 30 min.</p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>- Create a drawing of a real or imagined prehistoric marine reptile;</li> <li>- Make anatomical drawings that represent a body part adaptation; and</li> <li>- Give a real or imagined prehistoric marine reptile a name based on scientific naming conventions.</li> </ul>	<ul style="list-style-type: none"> <li>- Large-group Instruction</li> <li>- Small-group Instruction</li> <li>- Student Presentations</li> </ul>	<ul style="list-style-type: none"> <li>- Art Supplies</li> <li>- Paper</li> </ul>

Activity 1

# What's in a Name?

Students learn how scientists name a living thing in one of three ways: by reference to the location where an organism was found; in honor of a person with some connection to the discovery; or by reference to a unique body part or behavior.



*"Greek and Latin Word Parts" (optional; nationalgeographic.com/xpeditions/lessons/17/g35/greeklatin.pdf)*

## Directions:

- 1. Explain.** Scientists use Greek and Latin words and scientific conventions to name plants and animals, including prehistoric marine reptiles. There are three approaches: to reference the location where an organism was found; in honor of a person with some connection to the discovery; or to reference a unique body part or behavior.

One way scientists name living things is by the location where the animal lived or was first discovered. The mosasaur, a "Meuse River lizard," is named after a tributary of a river in the Netherlands, where the first known specimen was discovered. Ask students if they can guess where the *Argentinosaurus* was first discovered.

**Answer:** *Argentina.*

**Group Activity.** Brainstorm some names of imaginary prehistoric sea creatures if they were discovered in your local area. Write the names on the board.

- 2. Explain.** Other dinosaurs are named after famous people or for the lucky person who found them. The *Mosasaurus hoffmanni* is named after C.K. Hoffman. Ask students who *Nedcolbertia* is named after.

**Answer:** *Ned Colbert (Dr. Edwin "Ned" Colbert).*


Or *Ricardoestesia?*

**Answer:** *Richard Estes.*

**Group Activity.** Brainstorm some names of imaginary prehistoric sea creatures named after famous people and then after the students themselves.

- 3. Explain.** The last approach is to name animals by their body part, behavioral adaptations, or by whole body descriptions. Example: Englishman Richard Owen coined the word *Dinosauria* from "dino," (terrible) and "saur" (lizard). An *Ichthyosaur* is an "ichthy" (fish) + "saur" (lizard).

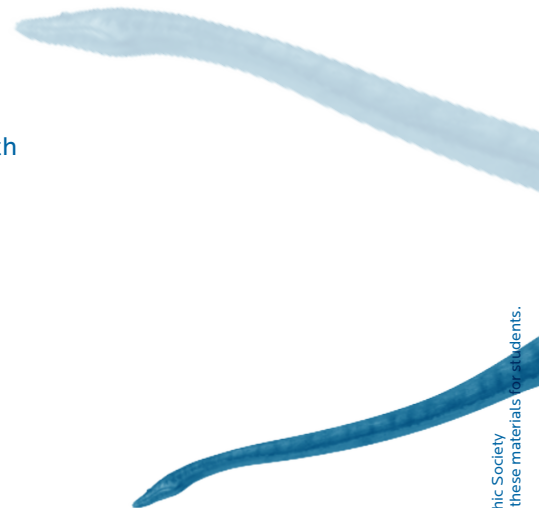
- 4. Group Activity.** Write the following Greek and Latin word parts on the board. Ask students to invent names for imaginary prehistoric sea creatures using three word parts (prefix, root word, and suffix). List these names and descriptions of the animals on the board. Example: a "Megabiceratosaurus" ('big two-horned lizard'). Additional Greek and Latin word parts are available online.

 [nationalgeographic.com/xpeditions/lessons/17/g35/greeklatin.pdf](http://nationalgeographic.com/xpeditions/lessons/17/g35/greeklatin.pdf)

**Note:** *This activity has been simplified for young students. Scientists would not mix Greek and Latin word parts.*

## Greek and Latin Word Parts

- bi—two
- cephal(o)—head
- cerat(o)—horn
- ichthy—fish
- mega—large
- micro—small
- odon or oden—tooth
- ops—eye or face
- ped or pes—foot
- rex—king
- rhino—nose
- saur(us)—lizard
- tri—three
- tyrann—tyrant
- uni—one
- vor(e)—eating



Activity 2

# How Do Animals Adapt?

Students are introduced to adaptations—changes in body parts or behaviors—that helped prehistoric marine reptiles survive in the Cretaceous period.



*“Animal Adaptations”*



## Directions:

**1. Explain.** Introduce the term “adaptation” to the students. An adaptation is a behavior or body part modification (change) that helps an animal survive where it lives. Explain that adaptations can occur through modified behavior (example: working in groups, swimming in schools to avoid predators) or modified body parts (example: chemical defense, camouflage, different limb shapes).

**Ask students to brainstorm other examples.**

**Possible answers:** *Modified body parts such as eyes (ability to see at night, ability to see far away, ability to see under water), keen sense of smell, large teeth, many teeth, claws, body size; modified behaviors such as playing dead, food selection, migration.*

**2. Discussion.** Tell students that, like modern day animals, prehistoric animals also adapted body parts and behaviors in order to survive. In *Sea Monsters: A Prehistoric Adventure*, they will encounter incredible sea creatures that lived 82 million years ago. Ask the class to look for adaptations—body parts or behaviors—that helped these creatures survive.

**View *Sea Monsters: A Prehistoric Adventure*.**

**3. Continue discussion.** Describe some of the challenges that the prehistoric marine reptiles faced in the film.

**Possible answers:** *Protecting their young, defending themselves, finding food.*

**4. Distribute “Animal Adaptations” to each student.**

As a class, review the model of the giraffe. Next, have students participate in a guided classroom discussion or do library or online research to complete the rest of the handout.

### Suggested Online Resources:

National Geographic: Sea Monsters—A Prehistoric Adventure

[nationalgeographic.com/seamonsters](http://nationalgeographic.com/seamonsters)

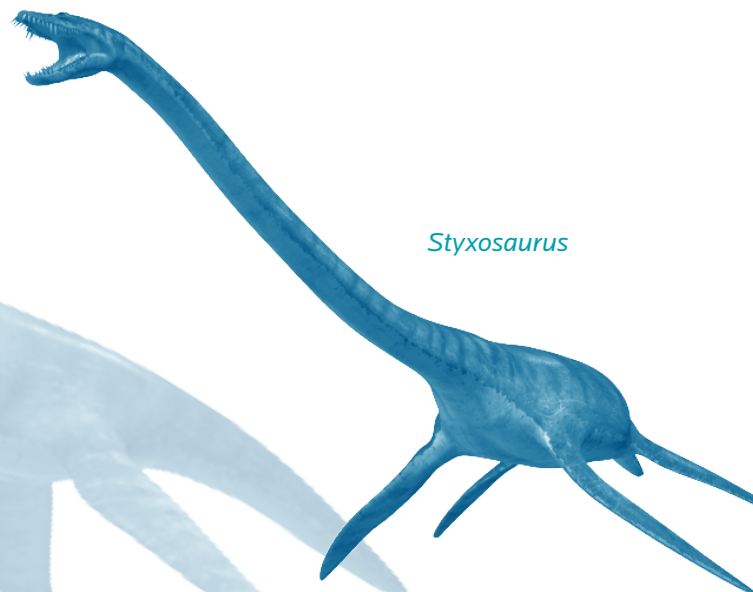
National Geographic Magazine: Monsters of the Ancient Sea

[nationalgeographic.com/ngm/0512/feature3/multimedia.html](http://nationalgeographic.com/ngm/0512/feature3/multimedia.html)

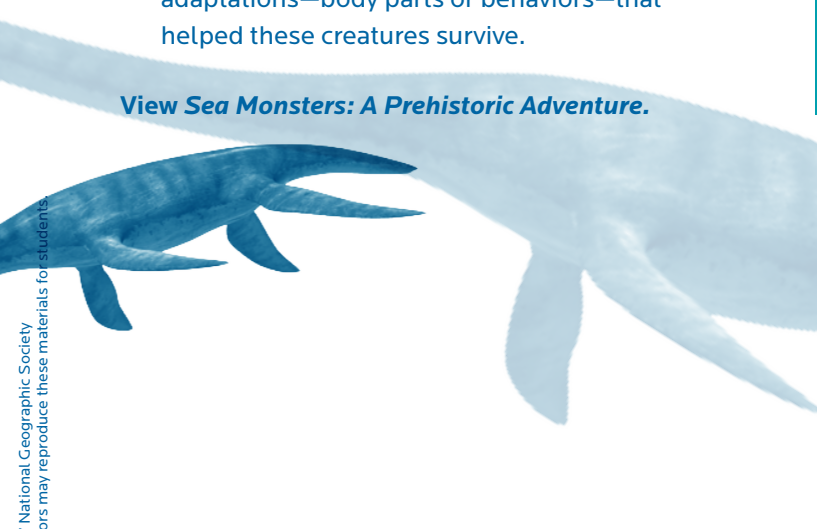
National Geographic: Animals

[nationalgeographic.com/animals/](http://nationalgeographic.com/animals/)

**5. Discussion.** Ask students to discuss what they learned about adaptations in modern and prehistoric animals.



*Styxosaurus*



Closing Activity

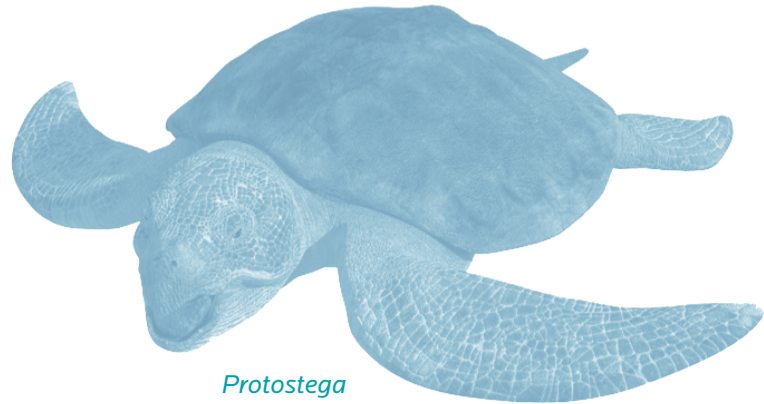
# Design-a-Saurus



Students create a drawing of a real or imagined prehistoric sea creature and name the creature after a place of discovery, an honored person, or an adaptation.

## Directions:

- 1. Review.** Ask students to think of the different adaptations they have discussed or seen in the film. Review the three ways scientists name something that is living or was once alive—after a person, a place, or an adaptation. Tell students that paleontologists often draw animals that they study.
- 2. Start activity.** Tell students they are going to create a profile of a real or imagined prehistoric marine reptile. To complete the assignment, students should:
  - Draw the real or imagined animal.
  - Label one or more adaptations, noting how it helped the animal survive in its environment.
  - Draw and label a map of where it was found and who first discovered it.
  - Name the prehistoric marine reptile. If it is an imagined animal, create a name after an adaptation, a place, or a person. If it is a real animal, explain the origins of its name.
  - Write one or more declarative sentence(s) about the animal.



*Protostega*

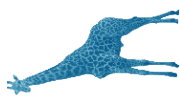
- 3. Student Presentations.** Have students share their work with the class. Students should introduce their animal by name, describe the animal (including its body part and behavioral adaptations) and how those adaptations helped it survive in its environment, and determine if the animal is named after a person, a place, or an adaptation.

## STUDENT ASSESSMENT


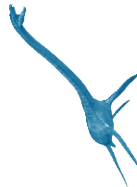

Students who master this lesson should have completed the “Animal Adaptations” handout with correct information about the animals researched. They should also create a drawing of a marine reptile that has one or more adaptations. Their created animals should be named after an adaptation, a location, or a person. The focus of the drawings are the adaptations shown and the way the creature is named. Emphasize the functions of the adaptations, not how well the drawings are made. Declarative sentences should accompany their drawings that accurately describe the adaptations. Students should be able to apply what they learned about adaptations (body parts or behaviors as a way to successfully survive in their surroundings) to modern animals. They should be able to give examples of adaptations from animals of which they are familiar.

# ANIMAL ADAPTATIONS

Use Internet or library research to complete the chart below. Use the giraffe as a model.

Animal	Animal Classification	Where it Lives	What it Eats	Body Part Adaptations	Behavior Adaptations	How Adaptations Help the Animal Survive
<b>MODERN ANIMAL</b>						
 <b>GIRAFFE</b>	Mammal	Grasslands of Africa	Leaves from shrubs and trees	Long legs, long neck, long tongue, good eyesight	Live in herds	Height and long tongue help it reach food; living in herds provides protection

## PREHISTORIC ANIMALS

 <b>TYLOSOSAURUS</b>						
 <b>STYXOSAURUS</b>						
 <b>CRETOXYRHINA</b>						