



LESSON: LONG LIVE THE SHARKS AND RAYS

GRADE LEVEL: 5-8

TOPIC/SUBJECT MATTER: Life Science

TIME ALLOTMENT: One to two 45-minute class periods

OVERVIEW:

During this video-enhanced lesson, students will watch video segments from the NATURE film "The Secret World of Sharks and Rays" and learn about adaptations that have helped sharks and rays survive. Students will explore similarities and differences between sharks, rays and other fish. They will watch segments that provide information about physical features and behaviors that have helped sharks and rays survive, with specific attention paid to the angel, wobbegong and saw sharks and the electric, sting and manta rays. Students will work in small groups to research a specific type of shark or ray and share their findings with the class. Students will discover that different types of sharks and rays have different temperaments and diets and that some of the largest sharks and rays are the most gentle.

MEDIA RESOURCES

Video

Clip 1

Fish, Sharks and Rays: A comparison of fish, sharks and rays

Clip 2

A Close Look at Sharks: A close look at angel, wobbegong and saw sharks and their survival techniques.

Clip 3

A Close Look at Rays: A close look at electric, sting and manta rays and their survival techniques.

Web sites

Ichthyology at the Florida Museum of Natural History

<http://www.flmnh.ufl.edu/fish/>



Learn more at www.pbs.org/nature.



This site features a rich variety of information, games and photographs of a variety of fish, including sharks and rays. The following sections are recommended for this lesson:

- **Sharks** (<http://www.flmnh.ufl.edu/fish/sharks/sharks.htm>)- This section features information, games and photographs of sharks.
- **Biological Profiles** (<http://www.flmnh.ufl.edu/fish/Education/bioprofile.htm>)- This section provides photographs and detailed information about specific sharks and rays, as well as other fish.

Kidzone Fun Facts for Kids: Sharks

<http://www.kidzone.ws/sharks/>

This Web site features a variety of photographs, activities and facts about sharks.

National Geographic: Sharks

<http://animals.nationalgeographic.com/animals/article/sharks-index.html>

This Web site features many photos and facts about sharks, which can be used in this lesson.

Seaworld: Sharks and Rays

<http://www.seaworld.org/animal-info/info-books/sharks-&-rays/index.htm>

This site contains a variety of facts, photographs and diagrams of sharks and rays.

STANDARDS:

National Science Education Standards, Grades 5-8

LIFE SCIENCE: Content Standard C

(http://www.nap.edu/openbook.php?record_id=4962)

As a result of their activities in grades 5-8, all students should develop understanding of

- **Regulation and behavior**
 - Behavior is one kind of response an organism can make to an internal or environmental stimulus. A behavioral response requires coordination and communication at many levels, including cells, organ systems, and whole organisms. Behavioral response is a set of actions determined in part by heredity and in part from experience.
 - An organism's behavior evolves through adaptation to its environment. How a species moves, obtains food, reproduces, and responds to danger are based in the species' evolutionary history.



- **Populations and ecosystems**
 - Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers—they make their own food. All animals, including humans, are consumers, which obtain food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers, and decomposers in an ecosystem.

- **Diversity and adaptations of organisms**
 - Millions of species of animals, plants, and microorganisms are alive today. Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.

 - Biological evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.

MATERIALS

For each group of 2-3 students:

- Books, reference materials and/or computers to conduct research on sharks and rays.

For the class:

- A large sheet of paper or board and something with which to write.
- A photograph of a bull shark and a photograph of a whale shark. (See "Prep for Teachers" section for details.)
- One computer for the teacher with a digital projection system (to play video clips either downloaded or streaming from the Web).

OBJECTIVES

Students will be able to:

- Discuss similarities and differences between sharks, rays and other fish;



- Describe physical features and characteristics that have helped sharks survive, with specifics about angel, wobbegong and saw sharks;
- Provide details of physical features and characteristics that have helped rays survive, with specifics about electric, sting and manta rays;
- Explain that there are many different types of sharks and rays, with varied skills, physical features, temperaments and diets;
- Explain that some sharks and rays are harmful to humans, while others are not and provide specific examples of harmful and gentle species;
- Discuss that sometimes the largest species can be the most gentle;
- Provide detailed information about one species of shark or ray.

PREP FOR TEACHERS

Prior to teaching this lesson, you will need to:

Preview all of the video segments and Web sites used in the lesson.

Download the video clips used in the lesson to your classroom computer, or prepare to watch them using your classroom's Internet connection.

Bookmark the Web sites used in the lesson on each computer in your classroom. Using a social bookmarking tool such as [del.icio.us](http://delicious.com/) (<http://delicious.com/>) or [diigo](http://www.diigo.com/) ([/www.diigo.com/](http://www.diigo.com/)) (or an online bookmarking utility such as [portaportal](http://www.portaportal.com/), www.portaportal.com/) will allow you to organize all the links in a central location.

Print out one photo of a whale shark and one photo of a bull shark to show the class. Make sure that the image of the whale shark is about 3 times larger than the bull shark. See the "Web sites" section above for a list of sites with shark photos.