

FIN-TASTIC SHARKS

TEACHER GUIDE



Grade Band: 3-5

Aquarium Program Length: 1 hour 30 minutes

Pre-Visit Activity Length: 1 hour 30 minutes

Post-Visit Activity Length: 1 hour 30 minutes

Overview

In a classroom introduction, students investigate sharks' unique adaptations, learn the role that sharks play in marine ecosystems, and come to understand why shark conservation is important. On the aquarium tour, students come face-to-face with several species of shark and learn what they have in common with other aquatic creatures. By the end of the program, students will understand why sharks should be revered, not feared.

Goal

Students develop enthusiasm for and a deeper understanding of sharks. Students will appreciate the role sharks play in the aquatic environment and recognize the importance of shark conservation.

Objectives

1. Students identify shark habitats and describe the importance of sharks as predators.
2. Students identify what an adaptation is and how adaptations are necessary for the survival of sharks.
3. Students recognize the importance of shark conservation and identify three threats to sharks as well as actions that can be taken to protect them.

Standards

3 Life Science Behavior, Growth and Changes - Individuals of the same kind differ in their traits and sometimes the differences give individuals an advantage in surviving and reproducing.

4 Life Science Earth's Living History - Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.

3 – 4 Inquiry - Observe and ask questions about the natural environment.

3 – 4 Inquiry - Communicate about observations and explanations.

5 Life Science Interactions within Ecosystems - Organisms perform a variety of roles in an ecosystem.

5 Inquiry - Think critically and logically to connect evidence and explanations.

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Vocabulary

Shark Adaptation Predator Prey Conservation Dermal Denticle Gills Carnivore Omnivore

Pre-Activities

Lessons to help prepare your students and enhance your field trip experience:

1. Marine Food Chain
 - a. Match the terms producer, herbivore, carnivore, and decomposer with their definitions.
 - b. Give students the marine organism cards. Students can organize them into a food chain starting with the sun.
 - c. Discuss how removing the shark would affect the rest of the food chain.
2. Adaptation Scavenger Hunt
 - a. Students compare images of two species, discussing how their physical features help them survive. (ex: Individuals' tails serve different purposes.) Teacher explains that an adaptation is a physical feature or behavior that helps an organism survive in its environment.
 - b. Students find adaptation cards hidden around the classroom and record how each adaptation helps the animal survive.
 - c. View a slideshow detailing different types of adaptations and more examples.
https://docs.google.com/presentation/d/1SL6eU3VVIPvzUTb_BbmFvdIrOh3QhDXQ_ZUTbsduhh8/edit?usp=sharing
 - d. Students design their own plant or animal and explain what adaptations it has developed.

Post-Activities

Lessons for the classroom to help reinforce concepts from your field trip experience:

1. Shark Research Project
 - a. Students use the internet to research facts about the three species of shark found at the Greater Cleveland Aquarium.
 - b. Students use their research to complete the shark information sheets.
2. Graphing Shark Data (adapted from oceanresearch.org)
 - a. The content in this lesson is based on the conservation work of OCEARCH™ and the Global Shark Tracker™. Spend a few minutes getting students familiar with the website and tracker.
 - b. Students use the Ocearch website to gather information and answer questions about great white shark individuals that are currently being tracked.
 - c. Students create a bar graph showing the weights of each shark.

Name: _____

Date: _____

Marine Food Chains

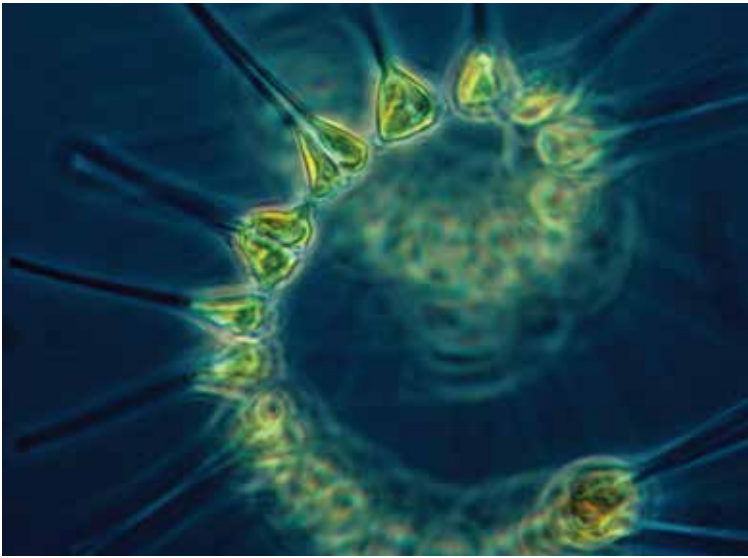
Directions: Match the vocabulary term to its definition.

- | | |
|---------------|---|
| 1. Producer | a. an animal that consumes only other animals |
| 2. Herbivore | b. an organism that breaks down dead plants and animals |
| 3. Carnivore | c. an organism that gets energy from sunlight |
| 4. Decomposer | d. an animal that consumes only plants |

Directions: Once you have arranged your cards, write the food chain in the space below.

SUN → _____ → _____ → _____ → _____ → _____

What would happen to this food chain if the great white shark became extinct?



Phytoplankton



Zooplankton



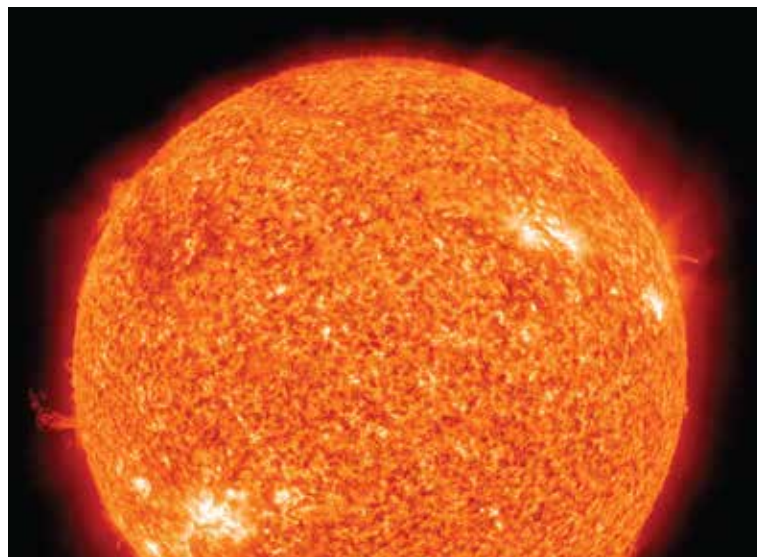
Sardine



Tuna



Great White Shark



The Sun

Photo By Brian Gratwicke via Flickr, Creative Commons License

Name: _____

Date: _____

Adaptation Scavenger Hunt



What features do these organisms have that help them survive?

Directions: Find each animal's card hidden around the room. Read the card and write a sentence or two about how the animal's adaptation helps it survive.

Species: Meerkat

Ecosystem: Desert

Species: Grey Reef Shark

Ecosystem: Ocean

Species: Koala

Ecosystem: Eucalyptus Forest

Species: Scarlet King Snake

Ecosystem: Desert

Species: Canadian Goose

Ecosystem: Pond

Species: Musk Ox

Ecosystem: Tundra

Name: _____

Date: _____

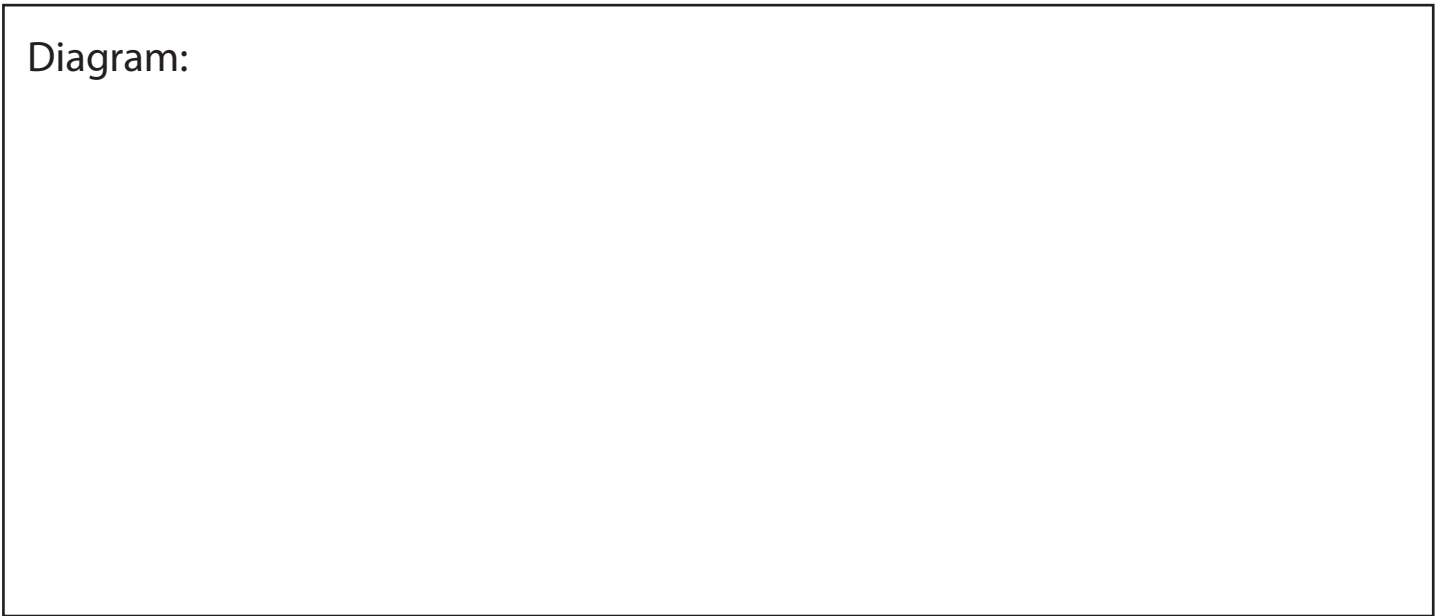
Adaptation Creation

Directions: Design your own species of plant or animal that has adapted to survive within a specific environment.

Name of your Species:

Ecosystem:

Diagram:



Adaptation:



Photo By C Watts, Creative Commons License

MUSK OX

For most people, hair is a decorative yet unnecessary feature. But to most mammals in the wild, hair offers important protection from the elements. The musk ox is a superb example. Its hair is an important adaptation to its bitterly cold home on the vast Alaskan tundra. Its thick, shaggy hair hangs down to the ground during the winter, when temperatures get as low as -30°F — then some of the hair is shed in time for summer, as temperatures reach $40\text{-}50^{\circ}\text{F}$.

The scarlet king snake is a harmless species. However, it has developed the same patterns and coloring of the venomous coral snake.



Photo By Glenn Bartolotti, Creative Commons License

SCARLET KING SNAKE

During warmer months, Canada geese are typically found in Canada and northern parts of the United States. However, as the weather becomes colder and resources grow scarce, the geese migrate. During this seasonal migration, the geese fly in a V-shaped formation and usually arrive in their southern grounds by mid to late November.



CANADA GOOSE



MEERKAT

Meerkats live in the hot deserts of Africa where the sun often shines brightly. They have dark circles of fur around their eyes that act like sunglasses. This adaptation helps them see even when the sun is shining brightly.



Photo By Tanaka Juuyoh, Creative Commons License

GREY REEF SHARK

Grey reef sharks have a method of camouflage called countershading. They are darker on the top halves of their bodies and lighter on the bottom. This causes them to blend in with the seafloor when seen from above and with the sunlight when seen from below.

Koalas in Australia have adapted to eat only the leaves of eucalyptus trees. These leaves are poisonous to most animals and provide very few nutrients.



KOALA

NURSE SHARK



Location:



Diet:

Fun Facts:

SAND TIGER SHARK



Location:



Diet:

Fun Facts:

SANDBAR SHARK



Location:



Diet:

Fun Facts:

Name: _____

Date: _____

Graphing Shark Data

Part A

1. Go to **oceanarch.org**
2. Click **Filters** on the toolbar on the right side of the screen.
Type in the name of the shark that you are looking for and click **Track**.
3. Click on the circle with the image of a shark to view the shark's profile.
Use the information to complete the table.
4. Click **Reset** and search for the next shark.

Table 1. Data for OCEARCH Great White Sharks

Name	Gender	Length (ft)	Weight (lbs)
Genie			
Courage			
Success			
Cyndi			
Luis Antonio			
Maddox			

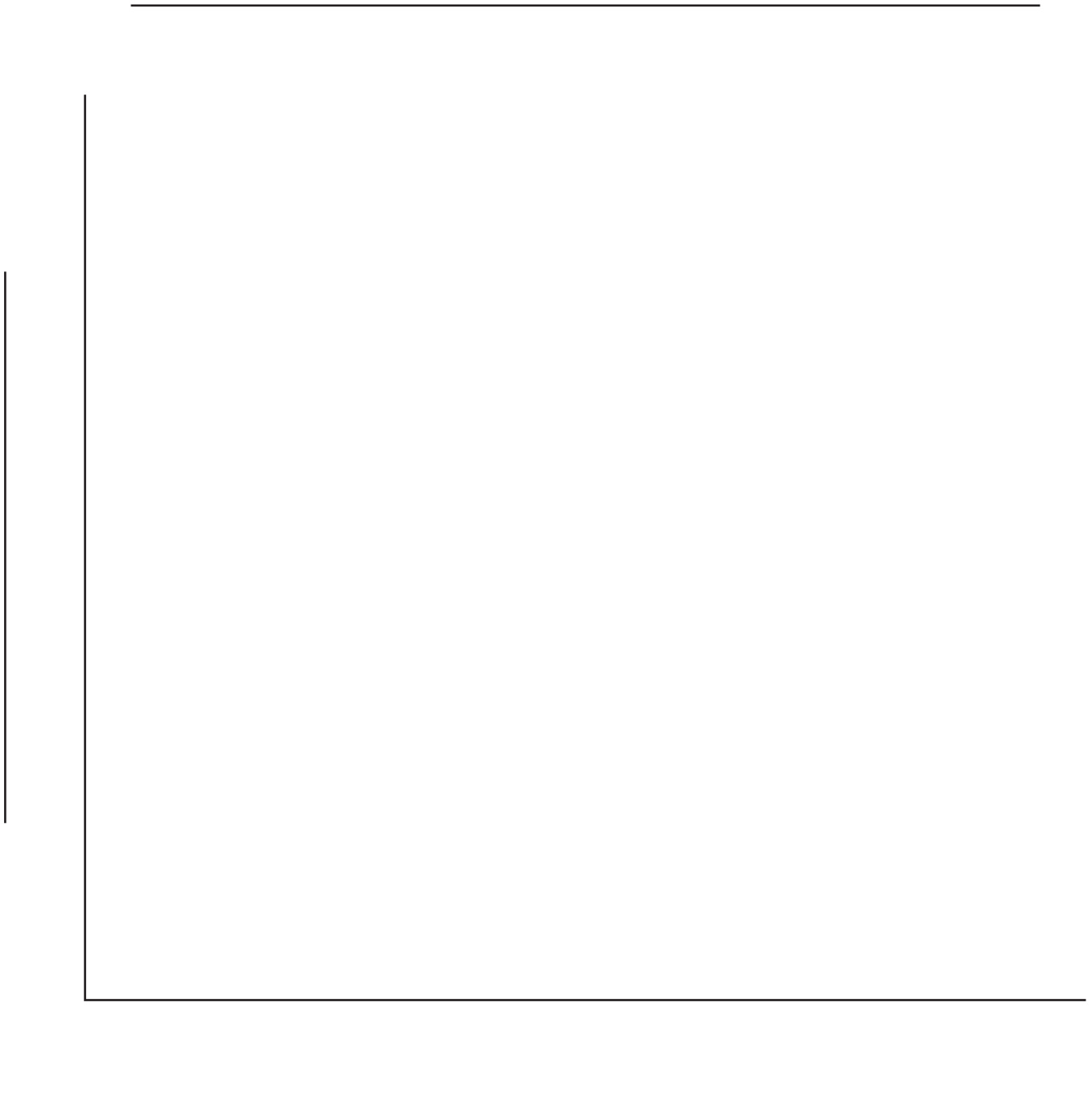
1. How many female great white sharks were tagged?

2. Which shark is the longest? How do you know?

3. Do females tend to weigh more or less than males? Use evidence to support your claim.

Part B

Graph the weights of the great white sharks using a bar graph in the space below. Don't forget to give your graph a title, and label the x and y axis.



Graphing Shark Data (Answer Key)

Part A

Table 1. Data for OCEARCH Great White Sharks

Name	Gender	Length (ft)	Weight (lbs)
Genie	Female	15	2,292
Courage	Male	12	1,372
Success	Female	16	3,583
Cyndi	Female	14	2,257
Luis Antonio	Male	11	909
Maddox	Male	14	2,100

1. How many female great white sharks were tagged?
Three female great white sharks were tagged.
2. Which shark is the longest? How do you know?
Success is the longest. Her length is 16 feet, which is longer than any other shark's length.
3. Do females tend to weigh more or less than males? Use evidence to support your claim.
Females tend to weigh more than males. The average weight of a female is 2,711 pounds, while the average weight of a male is 1,460 pounds.

Part B

