

Sharks! The Meg, The Monsters & The Myths

Curriculum

Shark Diversity

Enter the exhibit towards the right-hand side. Find the eight round portholes located on the wall opposite the large video screen.

There are hundreds of species of sharks that are grouped into eight different orders. Each porthole contains information for one species of shark from each of the eight orders. Explore each of the different sharks. Pick your favorite shark and complete the activity below.

Shark:

Order:

Diet:

Shade in the areas on the map where this shark can be found.



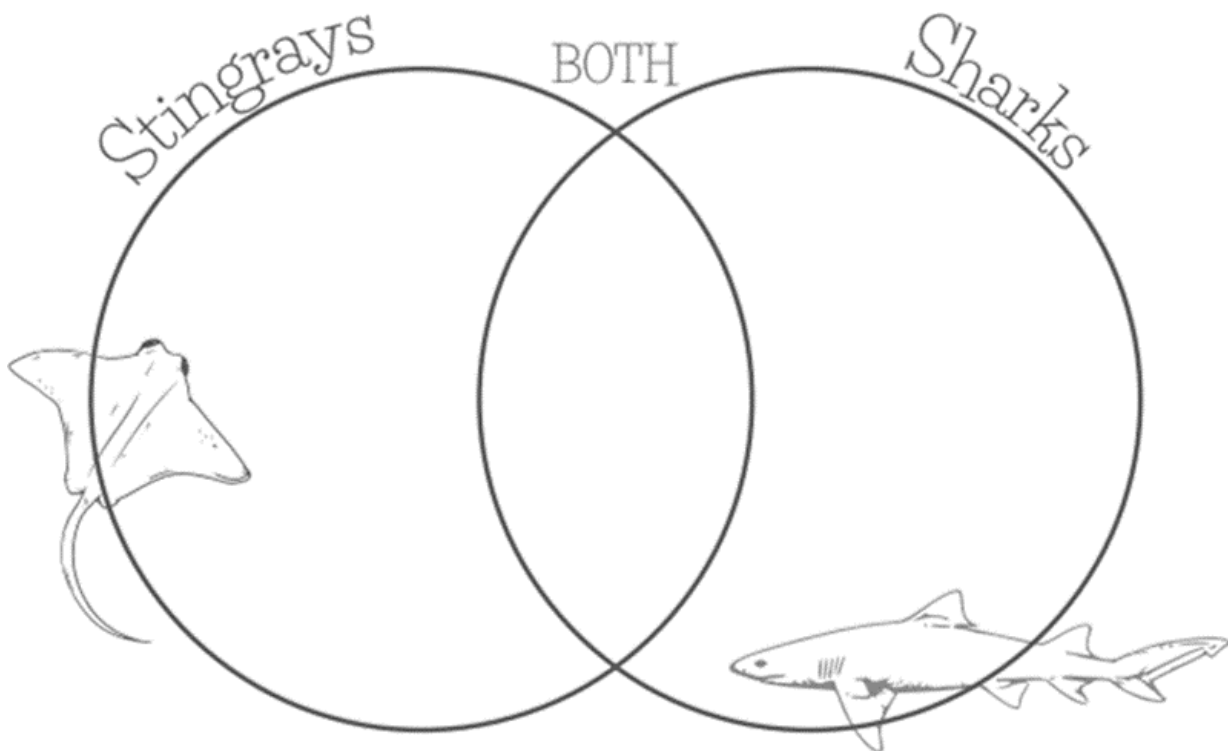
Can you find all eight sharks in the large-screen video?

Comparative Anatomy

Locate the comparative anatomy interactive in the next room.

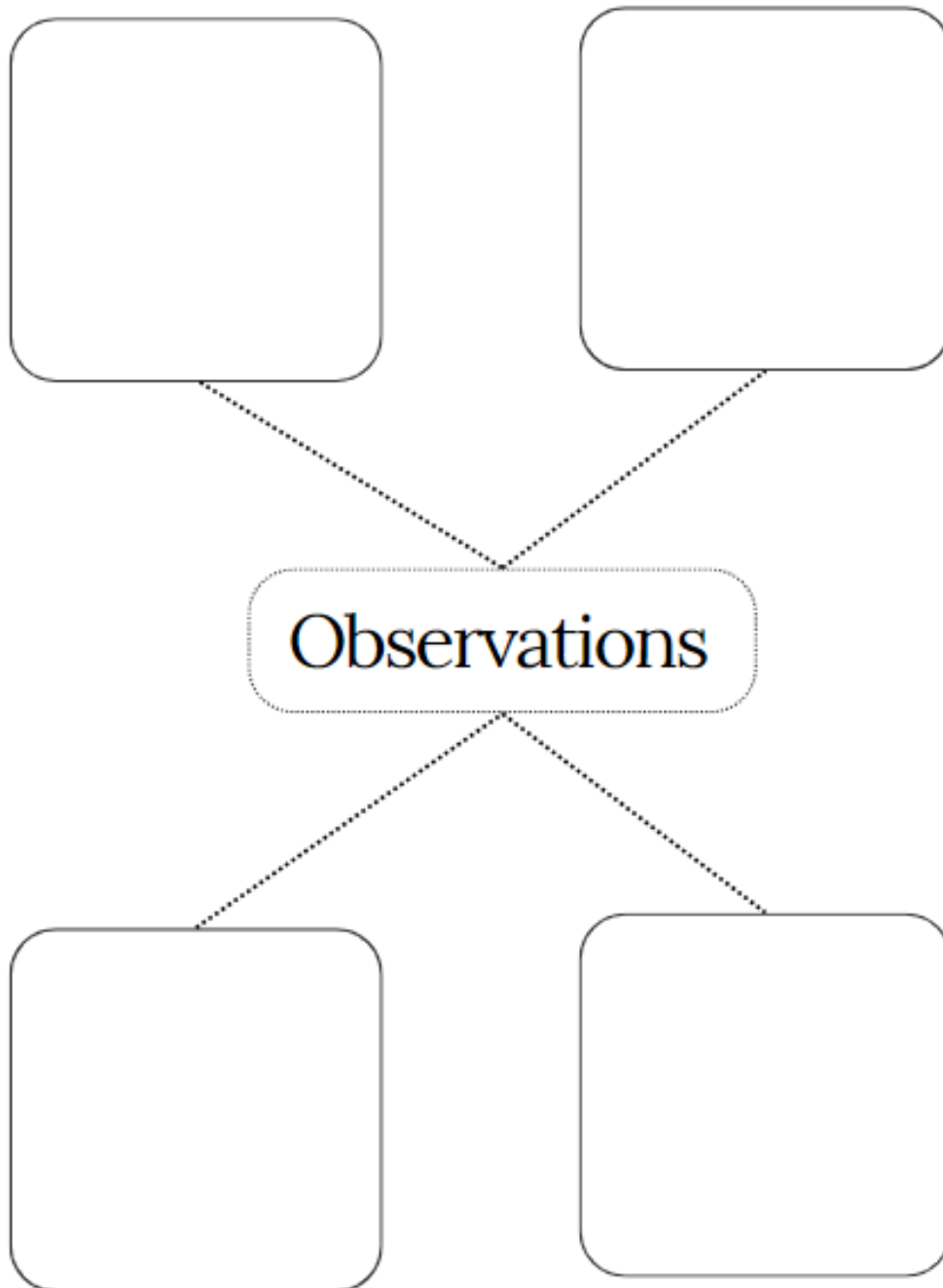
Press and hold each of the buttons to explore the similarities and differences between fish, sharks, and stingrays. Then, compare and contrast sharks and stingrays by placing the number for each description in the correct spot on the Venn diagram below.

1. Have skeletons made out of cartilage
2. Use gills to breathe
3. Have long slender bodies
4. Propel themselves forward using their caudal fins (tail)
5. Use pectoral fins to make turns
6. Have flat diamond-shaped bodies
7. Propel themselves forward using a wave-like motion of the body
8. Fast swimmers
9. Slow swimmers
10. Have poison barbs on their tails



Locate the model of the white shark that is hanging from the ceiling directly behind the comparative anatomy interactive.


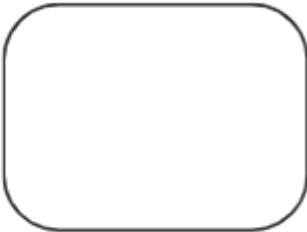


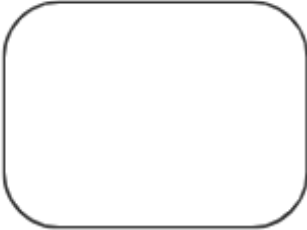







The bodies of many sharks are fusiform in shape, meaning rounded and gradually reduced in size towards both the head and the tail. This shape helps the shark swim more effectively by reducing drag through the water. Fill in the mind map below with four additional observations about the white shark's external anatomy.



Caudal Fins: Structural Adaptations

Find the four models of shark tails located opposite the comparative anatomy interactive.

The shape of a shark's "tail," called the caudal fin, is an example of a structural adaptation and reflects the shark's lifestyle. Explore adaptations and examine each of the caudal fin models to complete the chart below.

Species of Shark	Sketch of the Caudal Fin	Effect on the Shark's Lifestyle
		
		
		
		

View the full size megalodon sculpture (in the middle of the room) and the white shark sculpture (hanging from the ceiling). How do they look the same and how do they look different?

Compare	Same	Different
Megalodon		
White Shark		

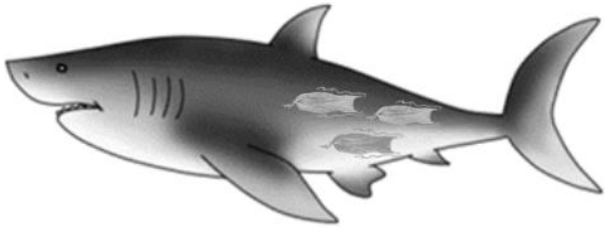
Give three reasons why do you think megalodon no longer exists?

- 1.
- 2.
- 3.

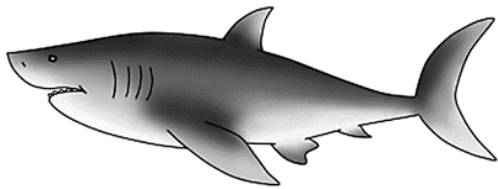
Shark Egg Cases: Reproduction

Find the shark egg cases located on the back wall.

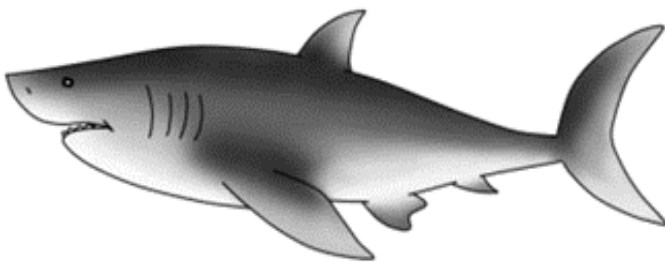
Explore the three types of shark reproduction and examine the various egg cases. Draw a line from each description to the picture that matches that stage in the lifecycle.



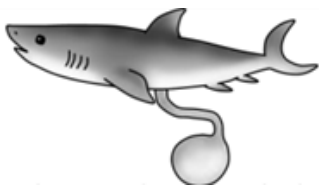
Once a shark matures it's considered an adult. Scientists believe that most sharks live between 20-30 years.



Once they become fully developed, the pups are born alive.



It takes a young white shark several years to develop into a full-size adult.

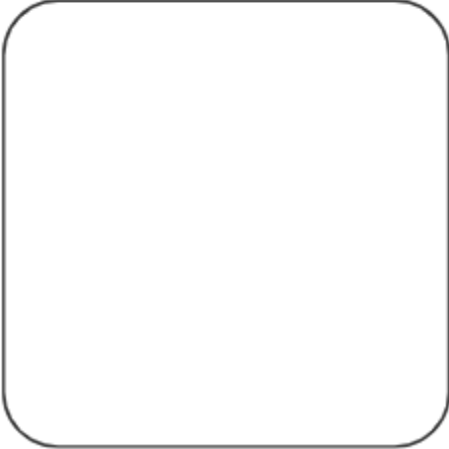
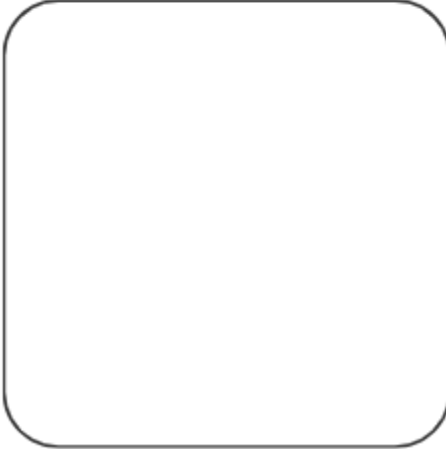


The adult white shark lays eggs inside their body. The embryos hatch and develop inside the mother's uterus before being born.

Prehistoric Shark Fossils

Find the shark fossils located on the back wall in the next section of the exhibit.

Explore the different types of prehistoric sharks. Pay attention to the various adaptations each shark had that allowed it to become better able to live in its environment.

Make a sketch of your favorite fossil	Describe a unique adaptation of this shark
	

Bioluminescence

Find the bioluminescence interactive display located on the right-hand side of the wall.

Explore the various ways sharks use bioluminescence to increase their chances of survival in harsh marine environments.

Choose two forms of bioluminescence that sharks use that you think would be useful if humans could use bioluminescence. Explain your decision.

1.

2.

Shark Teeth: Adaptations

Find the model shark jaws located behind the shark tooth identification counter.

Shark teeth are highly adapted and come in a variety of shapes and sizes. The teeth can be categorized into three general types: crushing, grasping, and cutting.

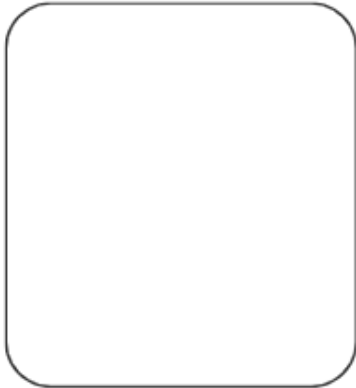
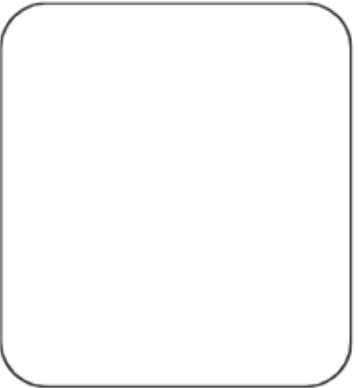
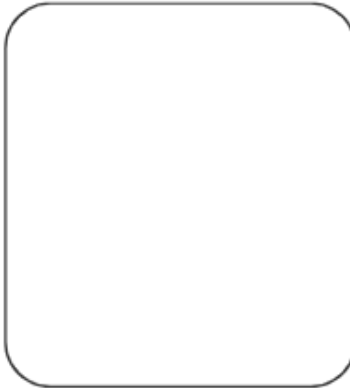
Explore the various types of teeth for each of the sharks listed below to complete the chart.

Shark Species	Sketch of Tooth	Type of Prey
Port Jackson Shark		
Short Fin Mako Shark		
White Shark		

Bait Balls: Defensive Behaviors

Find the bait ball sculpture that is hanging from the ceiling.

Explore the defensive behaviors of schooling fish and observe the bait ball sculpture to complete the chart below.

Make a simple sketch of the bait ball below	How does a bait ball work to protect individual members of a school of fish?	What behavioral adaptations have silky sharks developed in response to this defensive mechanism?
		

Fact vs. Fiction Quiz Board

Find the quiz board located near the bait ball sculpture.

Try your hand at answering the questions. What fact did you find most interesting? Write it below.

Shark Symbiosis

Use the text panel discussing symbiosis to define each word below.

Mutualism:

Commensalism:

Parasitism:

Competition:

Predation:

Amensalism:

Touch Tanks: Abiotic and Biotic Factors

Locate the touch tanks.

Biotic factors are living components of an environment, such as plants, animals, fungi, algae, and bacteria. Abiotic factors are non-living components of the environment, such as sunlight, temperature, moisture, wind, or water currents.

How many biotic and abiotic factors can you find in the touch tank environment? List them in the chart below.

Biotic Factors	Abiotic Factors

After the Exhibit: Extension Activities

Save Our Sharks

What did you discover about the importance of sharks to the ocean ecosystem?

What can you do in your everyday life to help ensure that sharks are protected?

Calculating the Length of a Megalodon

We might expect to see small teeth in small animals and generally larger teeth in larger animals. We could say their tooth sizes are proportional. If we assume that the ratios of body-to-tooth size for a white shark and a megalodon are proportional, we can estimate the approximate length of a megalodon based on the size of megalodon teeth and the known white shark body-to-tooth-size ratio.

Solve for X to find the approximate length of the megalodon.

- What is the ratio of the white shark tooth length to the body length of the white shark?
- What is the assumed ratio of the megalodon tooth length to megalodon body length (X)?
- Use the above ratios to calculate the missing length of a megalodon.

	Length of tooth in inches	Length of shark in feet
White Shark	1.8 inches	16 feet
Megalodon	5.8 inches	X

Hint: To solve this problem, you can use the concept of ratios and proportions.

Answer: _____

For an extra challenge, convert your answer to centimeters and meters.

Answer: _____

Bioluminescence

You learned about how sharks use bioluminescence during your visit to the exhibit. Biomimicry is the practice of using ideas found in nature to invent new technologies. Imagine how bioluminescence might be used in a new technology and briefly describe your idea below. Think about the two you choose during your visit as the most useful to humans.