

## Sharks

### Objective:

1. Students will demonstrate an understanding of the basic structure and function of a shark.
2. Students will be able to explain the habitat of a hammerhead shark.
3. Students will be able to describe the basic sensory, abilities, movement, and behavior of sharks.

### Performance Objectives:

**Grade 1:** Strand 4: Concept 1 – PO 1-3  
NGSS: 1-LS1-1

**Grade 2:** Strand 4: Concept 1 – PO 1-2  
NGSS: 2-LS4-1

### Grade 1 – 2

#### Key Vocabulary:

- Cartilage
- Buoyant
- Cold-blooded
- Predator

#### Related Literature:

*Hammerhead Sharks*  
Maria De Lorena

*Smiley Shark*  
Ruth Galloway

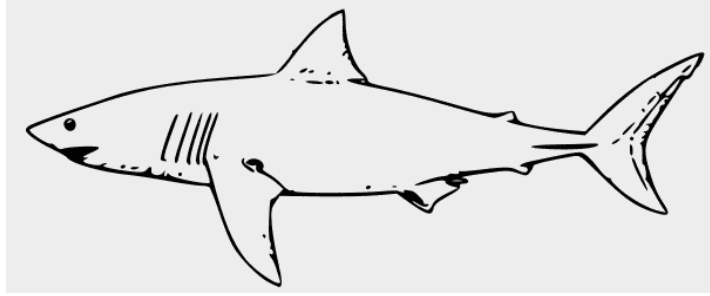
*I am a Shark*  
Darlene R. Stille

### Background Information:

The oceans are filled with marine life, big and small, fierce and gentle, fast swimmers and slow swimmers, and yet the most recognizable creature of the deep is the SHARK! When you hear the word “shark” what comes into your mind? That is right, huge teeth, fierce hunter, with a telltale fin. Sharks have been swimming in oceans since prehistoric times and are thought of as rulers of the sea. But are all sharks the same? There are more than 400 different species of sharks swimming in waters around the globe. However, if you go to the beach, it is not likely that you would see one while swimming in the ocean.

Most species of sharks live in deep ocean water away from the shore. Almost all sharks are meat eaters, and will eat most anything, even trash thrown in the ocean.

They are at the top of the ocean food chain, and their favorite foods are squid, fish, lobsters, and stingrays. Humans are not on the menu for sharks, and they do not like the taste of people. Most shark bites on people accident because the shark thought the person was a seal or ray.



Sharks are considered ‘cartilaginous fish’ and do not have bones like many other fish. The shark body is made of **cartilage**, a thick material much like a human’s ear. The cartilage allows the shark to be more **buoyant** (something that easily floats) and flexible, which is important to the shark’s ability to swim at great speeds and bend or turn with enormous power. The shark’s powerful body is covered with a thick skin that provides protection. The scales on the skin are tougher than the scales on a boney fish and feel like sandpaper.

These **cold-blooded** creatures have evolved and adapted to changes on Earth over millions of years. Their body temperature changes as the water around them becomes warmer or colder. Most sharks must swim all the time to keep their blood circulating throughout the body. The fins on a shark play an important role in the shark’s movement. There are five different fins that are designed to help move and balance the shark as it swims at great speeds or as it floats along gracefully in the currents.



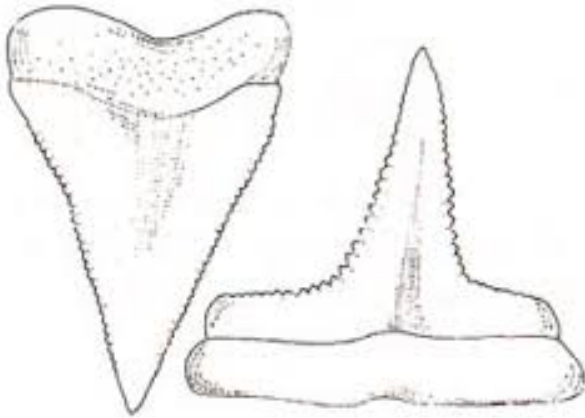
Unique to sharks are their rows of teeth that often loosen or fall out. Sharks have teeth that are designed to tear away parts of food so they can swallow it down fast. Sharks do not chew their food like people do, and their sharp teeth look very different.





This is a shark's jaw with many teeth. A shark can have around 3,000 teeth at one time. Each type of shark has slightly different shaped teeth, and as one tooth falls out, another tooth moves into place.

Most sharks have about 15 rows of teeth in each jaw. Baby sharks are born with all of their teeth, and as they grow, the teeth will move into place just like an adult shark.

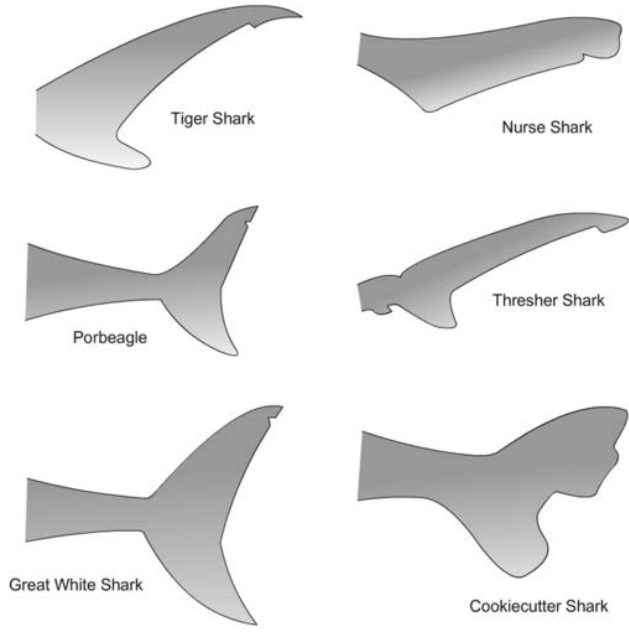


Notice the difference in the shape of the shark teeth.

Most shark teeth are pointed, sharp, and have serrated edges, which mean they are jagged on the outer edges.

Shark teeth from prehistoric times have been found on beaches and on the ocean floor. The prehistoric megalodon shark had teeth as big as 7 inches long. Every part of the shark's body has a purpose, even the tail. Sharks can move quickly in the water by using their entire body to move themselves forward. Sharks have been known to leap out of the water to catch their food, but most sharks find food by swimming quietly and sensing their prey.





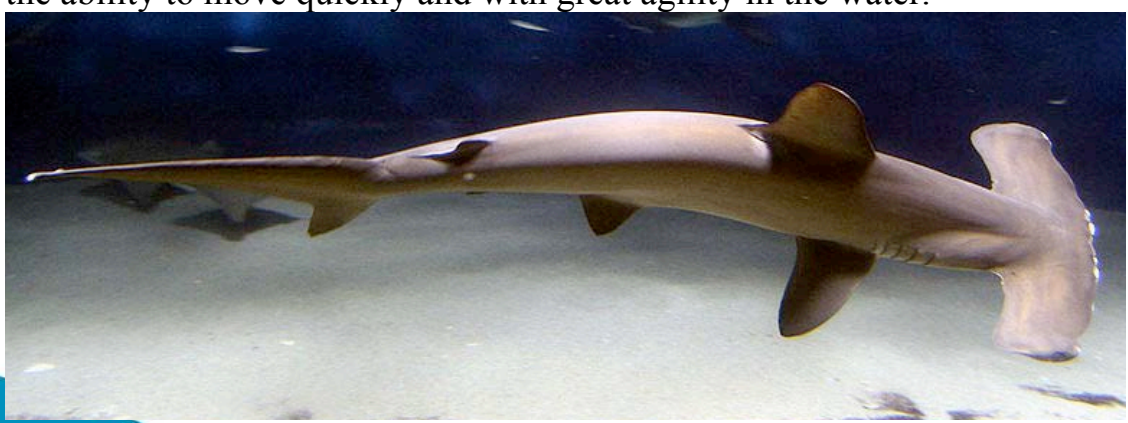
Shark Tails

The tail of a shark can be used to determine the differences between sharks. Notice how the shape and size of each tail is different. The tail of a shark is similar to a rudder on a boat. It helps the shark move rapidly through the water and turn their body in different directions. Along with the fins, the tail is a perfect mechanism to ‘steer’ the shark on its journey through the ocean.

Characteristic of sharks is their keen sense of hearing, and it is believed they can hear low

frequencies over enormous distances. A shark’s eyes are light sensitive and designed to see in the low light of deep water. Their third eyelid can cover the eye completely to protect it. In addition, sharks have a very strong and unique sense of smell. Sharks can smell the scent of a fish or blood in the water as far as a mile away. All of the characteristics of a shark make it a top **predator** in the world’s oceans.

One of the most interesting and unique types of shark is the hammerhead shark. Likely named for its oddly shaped head, hammerhead sharks are easy to identify. There are ten species of hammerheads that range in size and differ slightly in head shape. The largest species, the great hammerhead, can reach 11 feet or more and over 500 pounds. Similar to other sharks, the hammerhead has a sleek body with the ability to move quickly and with great agility in the water.



Hammerhead sharks prefer warm, temperate water and can be found in most tropical waters around the world. These sharks migrate along the coastal areas as water temperatures change and food sources fluctuate. Preferring to dine on stingrays, fish, crabs, lobster, and squid, hammerheads hunt alone.

The hammerhead is distinctively adapted to precision hunting in the ocean. The head shape and placement of the eyes allow this shark to see at 360 degrees at all times. That means this shark can see very well above, below and to the sides as it moves swiftly in the water. The shark's ability to sense electrical fields enhances the hammerhead's hunt for stingrays, even if they are below the sand. These adaptations contribute to the efficiency of hunting at night and the survival of the species.



Another unique feature about hammerhead sharks is their frequent 'suntan.' Hammerhead sharks produce more melanin (colored pigment) in their skin than other sharks. As the hammerheads swim close to the surface of the water, the sun rays cause the melanin to change, giving the shark's skin the appearance of suntan. This often occurs when hammerheads congregate by sea-mount cleaning stations are underwater mountains where cleaner fish live, and sharks come to allow these fish to eat dirt and particles off their skin. The sharks can float or swim slowly while cleaner fish do their job cleaning the shark's skin.



At the top of the ocean food chain, hammerhead sharks are the perfect predator. These sharks can find food quickly, swim with rapid speed, for continued survival in the ocean. These strong ocean creatures have rarely been a danger to humans and are considered harmless by most scientists. Sharks in general contribute to maintaining balance in the ocean ecosystem and yet they remain vulnerable to



overfishing, pollutants in the ocean, and illegal ‘fin’ hunting by humans. Some cultures of people around the world eat “shark fin soup”, and hunt sharks to make it. Several species of sharks remain on the IUCN Red List, and conservation efforts have been established around the globe to ensure survival of sharks, including the hammerhead shark.



Additional Resources:

Sharks Breaching: <https://www.youtube.com/watch?v=4EojXTOtNTA>

Shark Bites Explained: <https://www.youtube.com/watch?v=jZuUGJRtreI>

Shark Egg Birth: [https://www.youtube.com/watch?v=CP\\_xkNYq49M](https://www.youtube.com/watch?v=CP_xkNYq49M)

Shark Live Birth: <https://www.youtube.com/watch?v=LfQgRCg1bNA>

Sources: National Oceanic and Atmospheric Administration (NOAA); National Geographic; Shark World; IUCN Red List; Our Endangered World (OEW). Photos: OdySea Aquarium; Public Domain.

### **Procedures and Activities:**

1. State the learning objectives. Review previous instruction as it relates to the topic and objectives.
2. Review vocabulary.
3. Read related literature, and follow-up with discussion and open-ended questioning. Use technology to project pictures of shark species to compare characteristics of types.
4. Use technology and maps to locate areas of oceans and seas where various species of sharks are found and why. Discuss water temperatures, ocean depth, and food sources.
5. Discuss populations of sharks, hereditary traits, adaptations, existence on earth, migration patterns, and threats.
6. Discuss the ocean as an ecosystem and the role sharks play in the food chain and balance of life in the ocean.



Indicates 'take along' activity.

**Activity:** To reinforce the general information about the body of a shark, ask students to complete the activity, 'Label the Shark'



**Activity:** 'Find the Sharks!' is a scavenger hunt to bring to the aquarium.

**Activity:** As a follow-up to the fieldtrip and discussion of sharks, students make a large poster about their favorite shark, or a hammerhead, and a few facts. Students share their posters with the class. Materials: poster board, markers, cutouts of sharks, and glue.

**Activity:** Using technology, students investigate the ocean food chain with sharks at the top. Students then illustrate their findings. Materials: construction or drawing paper, colored pencils, and computers.

**Activity:** Shark infested water is an activity and a snack. (See sheet for materials.)

**Activity:** Color the shark.

**Activity:** Students can identify two very different types of sharks by using technology or in discussion. Share the similarities and differences in size, shape, food, and habitat.



**Activity:** Name tags can be made using cardstock paper. Use a hole punch to make a hole in the top of the tag, tie a length of yarn through the hole and long enough for the tag to hang down on the student. Write names on tags.

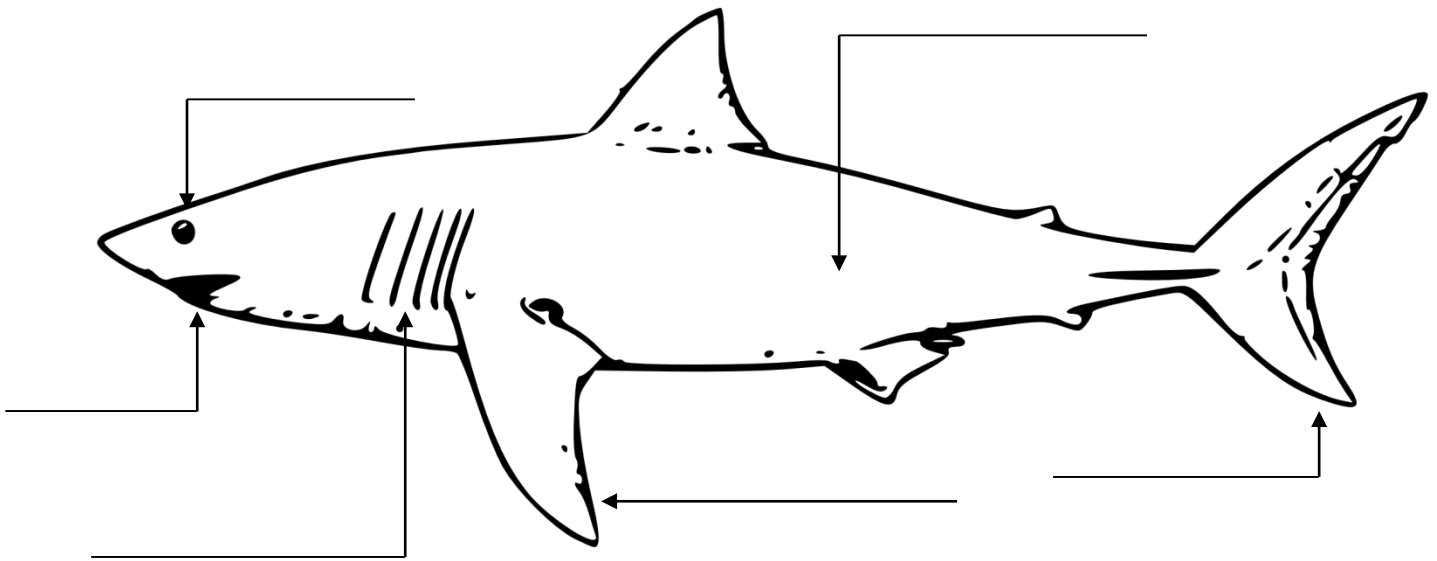
**Activity:** Create shark fins by cutting gray construction paper into large triangles. Glue a Popsicle stick on the back and you have a shark fin puppet.

**Reflections and Assessments:** Students are assessed on various levels depending on the activity. Participation, grade standards, and percentages may be applied to each activity. Activities are designed for flexibility and use pre or post fieldtrips.

Most activities meet the STEM education guidelines.



# Label the Shark



Word Bank:

Eye

Fins

Tail

Gills

Teeth

Scales







## Find the Sharks!

While at OdySea Aquarium, look for the different species of sharks! When you find them, write down a fun fact.



Scalloped Hammerhead Shark Fun Fact:

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Blacktip reef Shark Fun Fact:

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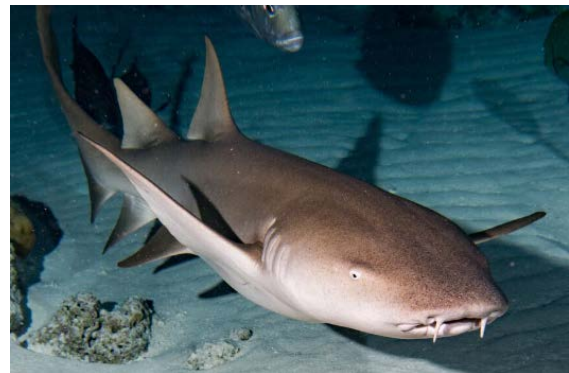


Sand Tiger Shark Fun Fact:

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Nurse Shark Fun Fact:

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# Shark Infested Water!



Materials: Clear plastic cups, Blue boxed gelatin, Whipped cream, Gummy sharks.

Note: gummy sharks can be ordered online and come in one pound bags. The spray whipped cream works best.

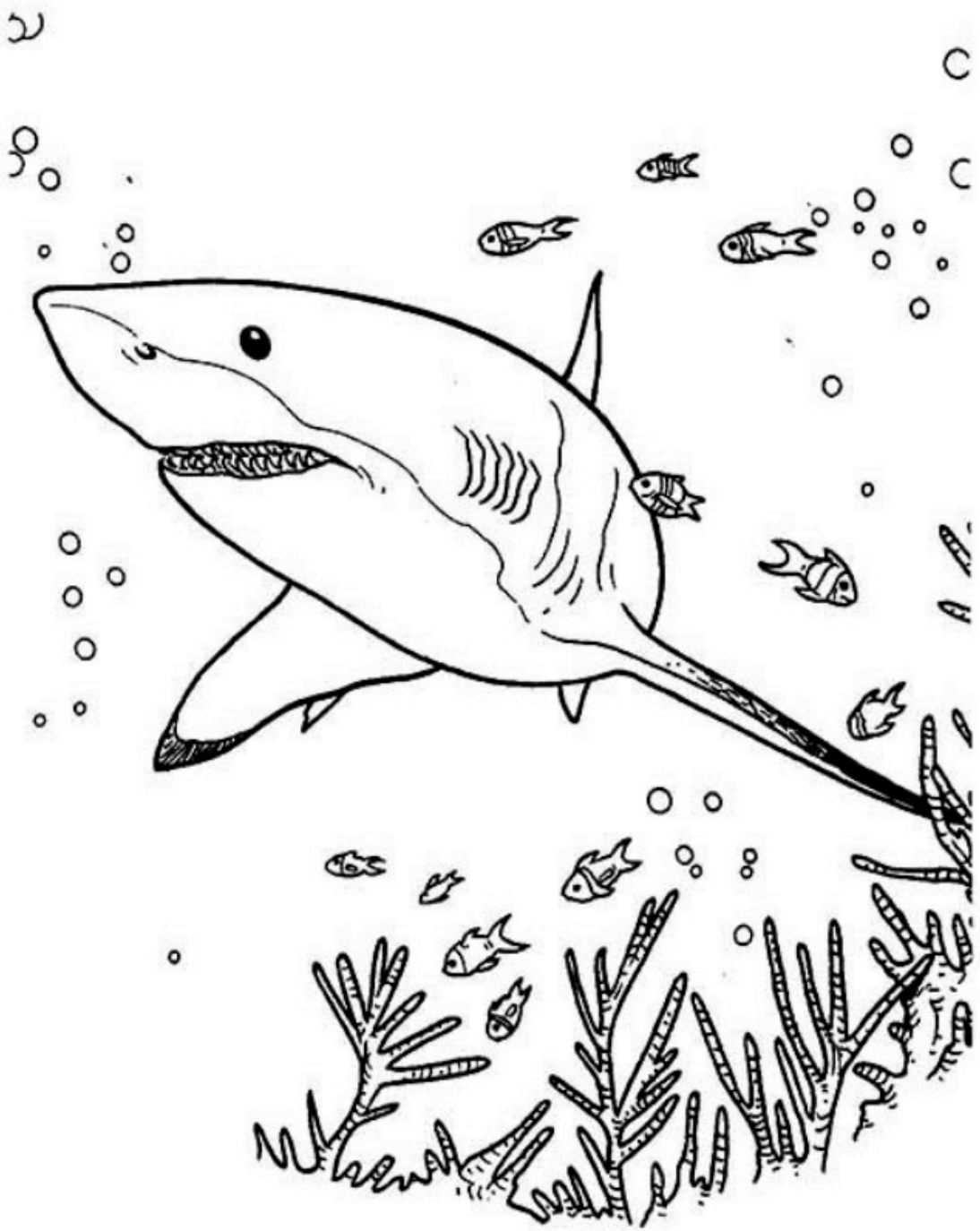
Directions: Mix gelatin according to package. Fill cups slightly over half way with jell-o and refrigerate. Once gelatin is set, top it with whipped cream and gummy shark. Your shark infested water is complete!

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## **Easy Snack**

Give students a gummy shark and a few goldfish crackers. They can demonstrate the food chain while the shark eats the goldfish crackers! Yum!

Color the Shark



# Shark Name Tags

