

## Virtual Field Trip Program Materials

Dear Teacher,

We are looking forward to our interactive virtual field trip with you and your learners. During the program your learners will have the opportunity to explore the unique animals of the Pacific Ocean with one of our Aquarium Educators.

The following materials are provided to support learner exploration and dive deeper into program topics. These resources are optional and can be used before or after your virtual field trip. Suggested discussion questions and a vocabulary word list are also included.

### Sensational Sharks (Gr 3-5)

- |                                 |                      |
|---------------------------------|----------------------|
| • Shark Writing and Exploration | Pre or Post Activity |
| • Sharks and Rays               | Pre or Post Activity |
| • Shark Coloring page           | Pre or Post Activity |
| • Shark Bodies                  | Post Activity        |
| • Shark Crossword               | Post Activity        |

You may find additional activities for your learners in pre/post materials from other programs.

Thank you for your interest in our programs, we are excited to connect with you!

Sincerely,

The Aquarium of the Pacific Education Staff



# Teacher Resources

## Vocabulary Word Bank

**Cartilage:** A firm, elastic, and flexible type of connective tissue. A significant amount of the human skeleton is cartilage, but the entire skeleton of sharks and rays is made of cartilage.

**Dorsal Fin:** Triangular fin on the back of fish and whales, used for balance.

**Caudal Fin:** Tail fin on a fish, used to propel animals forward.

**Pectoral Fin:** Pair of fins on either side of a fish, used for steering or moving forward.

**Gills:** The respiratory organ of fishes and some amphibians.

**Nares:** Nostril-like structures of sharks and rays-only used for smelling, not involved in breathing.

**Dermal Denticles:** Microscopic scales of shark and rays. Dermal denticles grow and have a tooth-like shape.

**Vertebrae:** Series of small bones or cartilage forming the 'backbone' of an animal.

**Fusiform:** The football or lemon shape used to describe the body shape of many fish.

**Ampullae of Lorenzini:** Electroreceptors on the head of sharks and rays that can detect electrical signals created by an animal's heart-beat.

**Spiracles:** A hole or slit on some sharks and rays that pumps water over gills to allow these animals to breath while resting on the ocean floor.

## Activity Notes for Teachers

### Shark Writing and Exploration

This activity is designed to be used as either a pre or post program activity. The prompts are designed to help learners explore what they know and what they want to know about sharks and encourage them to think creatively about what it would be like to be a shark researcher.

### Sharks and Rays

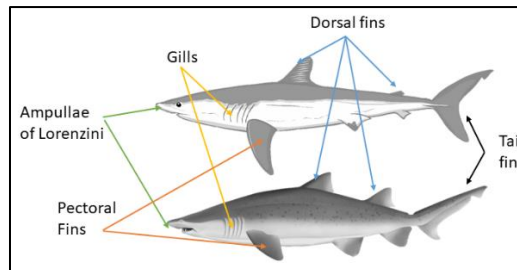
This activity can be done as a pre or post program activity. Learners will use the images of a shark and a ray to compare and contrast these two related animals, using the lines/space given to fill in similarities and differences. For the second half of the activity, learners will think about shark skeletal structures in comparison to human skeletons. Learners will think about what the advantages to having a flexible cartilaginous skeleton may be. Feel free to use our Aquarium webcam of Shark Lagoon to make observations about sharks and how they move their bodies.

### Shark Coloring Page

Enjoy this coloring page of a variety of different shark species including a whale shark, tiger shark, sawfish, sandbar shark, black-tip reef shark, nurse shark, and guitarfish

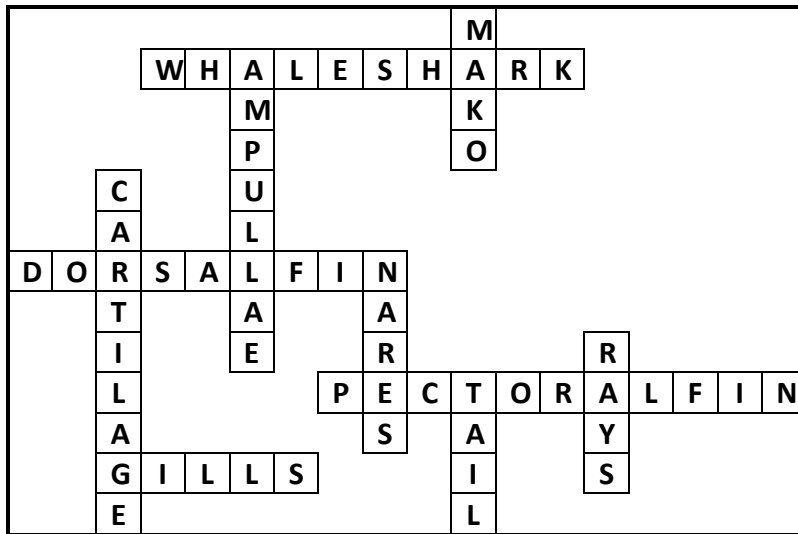
### Shark Bodies

This is designed as a post program activity to review shark anatomy and to look at the differences between two shark species. Learners will use the word bank to either match the word to the correct body part on both sharks by drawing a line from the word to the part on the shark, or alternatively, learners can write the word next to the appropriate body part.



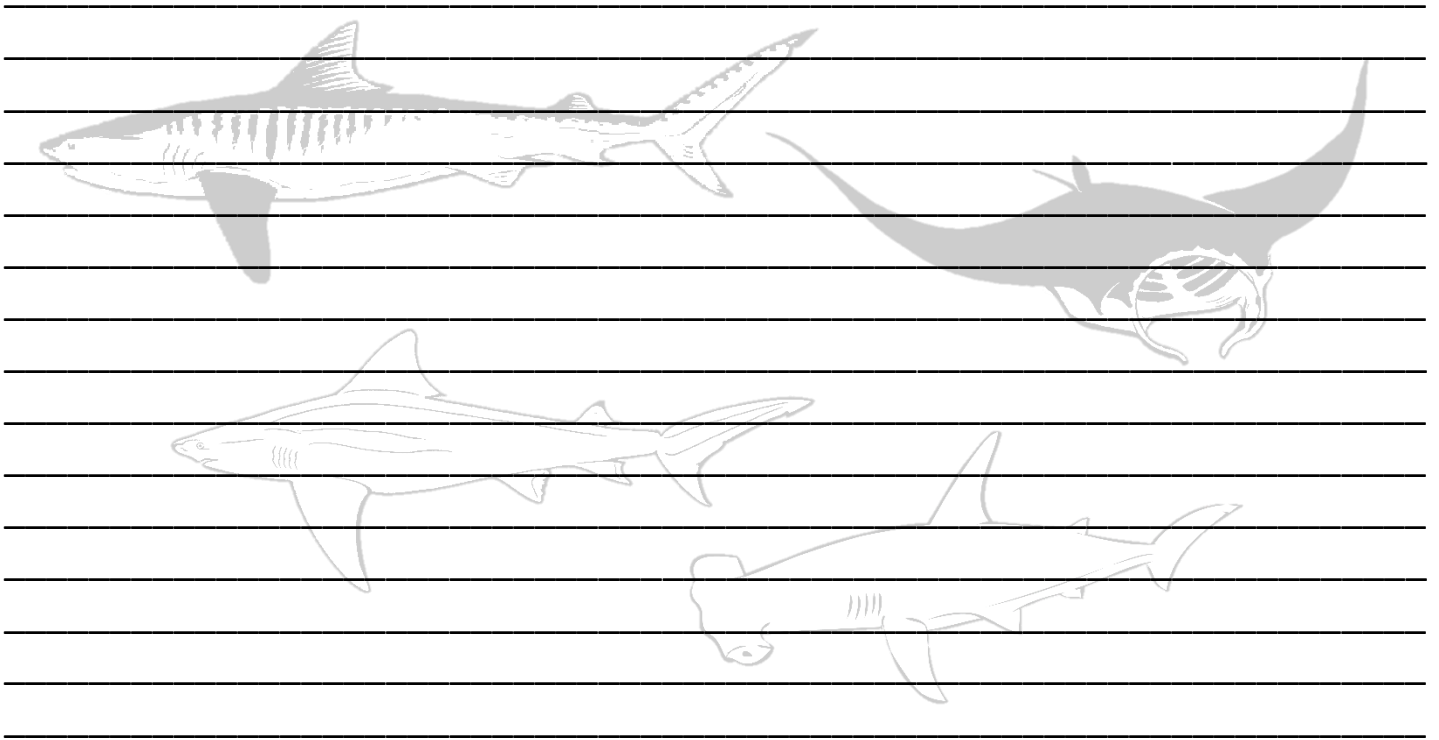
## Shark Crossword

This is designed as a post program activity to help learners review some shark adaptations. This is an optional activity you may use with your learners, questions can be modified if needed.

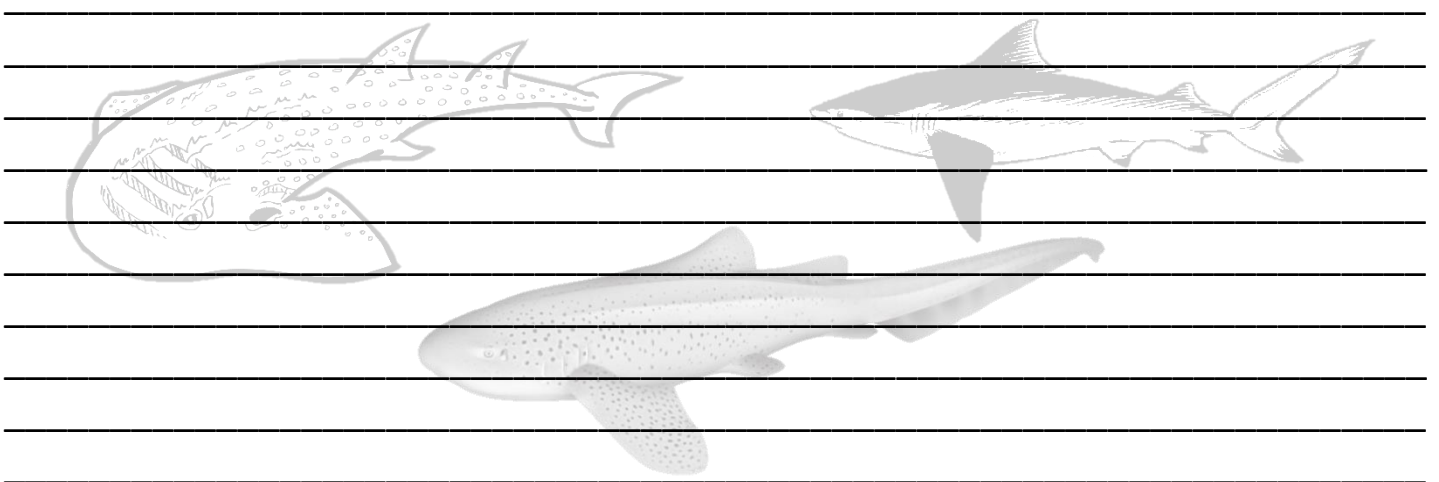


# Shark Writing and Exploration

What are some things you wonder about sharks, or their relatives, the rays? If you worked as a shark scientist how could you explore further to answer those questions?



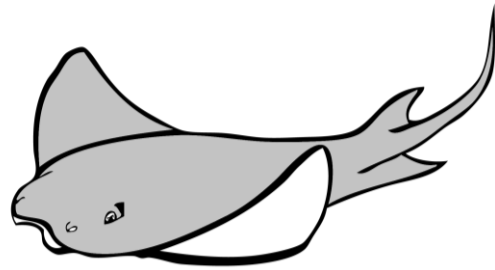
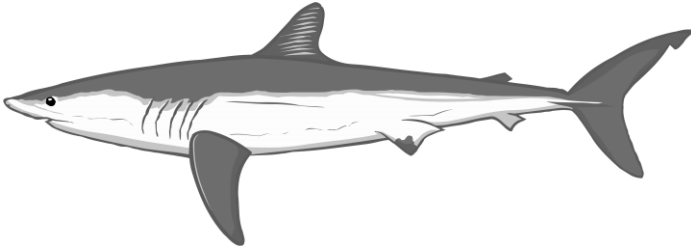
You're a shark researcher exploring a coral reef, what kind of equipment would you need to find sharks and record what you see? If you need to invent new equipment what would that be?



# Shark and Rays

## Compare and Contrast

Compare and contrast the shark and ray below. Write down as many similarities and differences you notice between these two animals. If you need more space, you can write on the back of the paper.



Compare (what is the same)	Contrast (what is different)

## It's what's on the inside that counts

There are 2 main groups of fish: bony and cartilaginous (cartilage). Cartilaginous fish are the sharks, rays, and chimeras. Bony fish are all the others we tend to think of like sea bass, eels, goldfish, or trout.

Think about the differences between bone and cartilage in our bodies. Where do we have cartilage? How is it different than bone?

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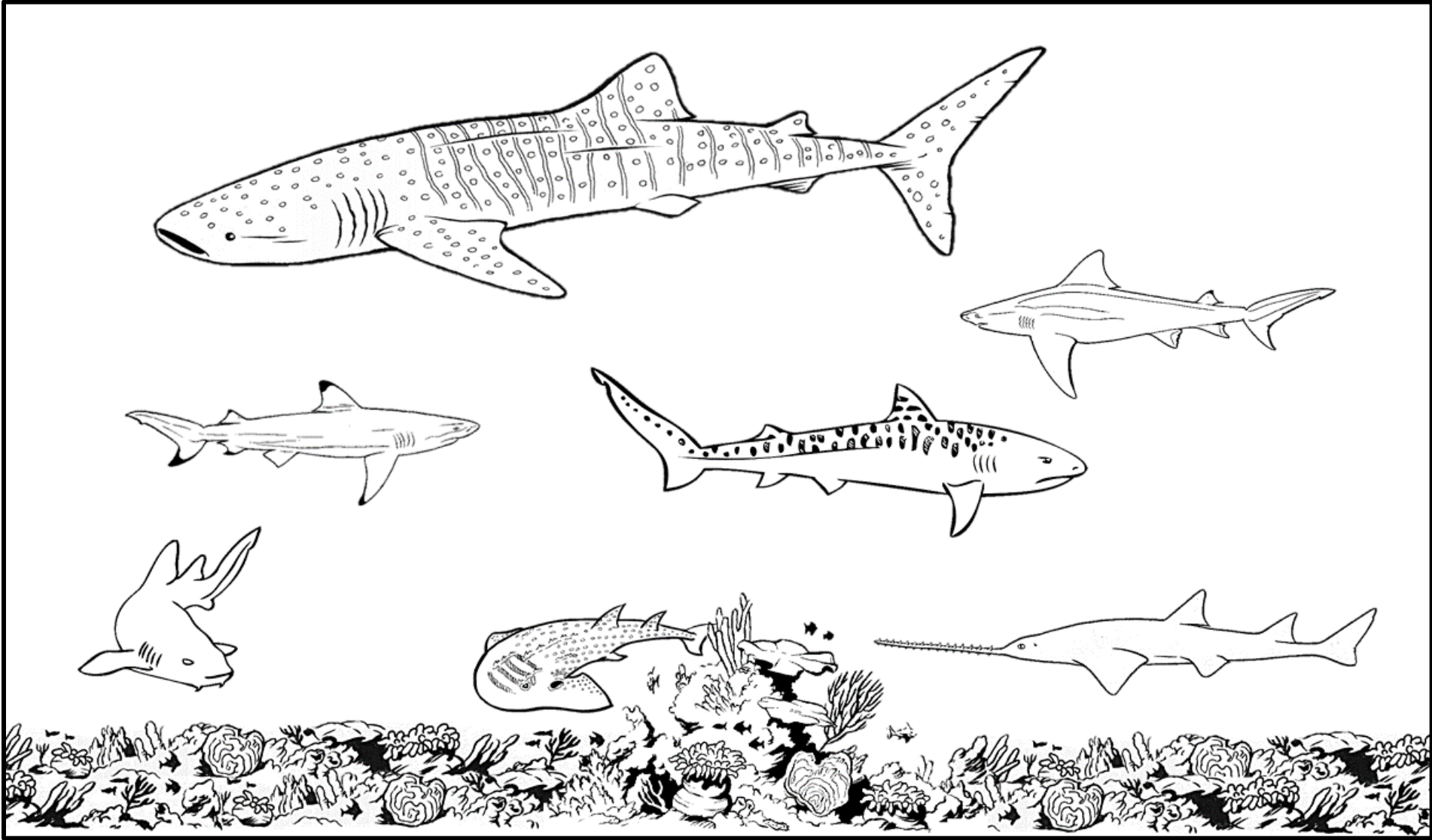
What do you think are some advantages to having an all cartilage skeleton like a shark? (hint: you can watch our shark lagoon webcam for help [www.aquariumofpacific.org/exhibits/webcams/webcam\\_shark\\_lagoon](http://www.aquariumofpacific.org/exhibits/webcams/webcam_shark_lagoon))

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# Shark Coloring Page



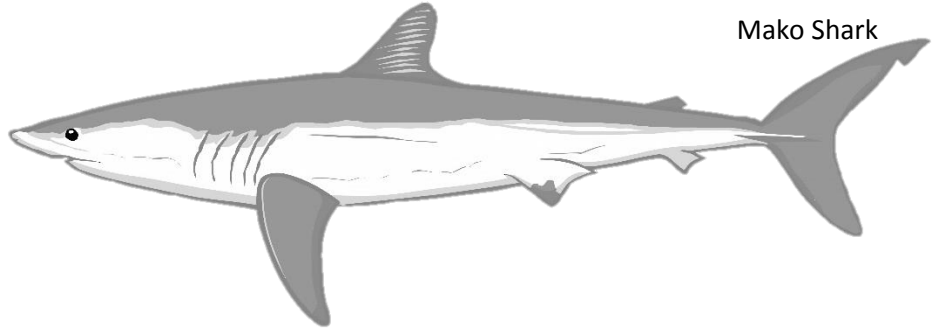
# Shark Bodies

You can tell a lot about a shark based on its body. The mako shark (top) and the sand tiger shark (bottom) look pretty similar when you first look at them, but let's explore closer!

Using the word bank label the parts of a shark. Either write it by the part of the shark or draw a line from the word bank.

**Dorsal Fins**

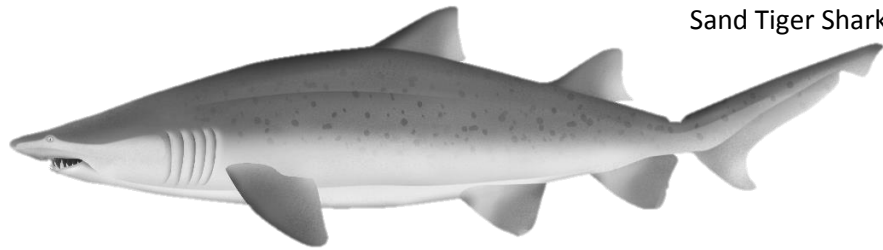
Mako Shark



**Tail Fin (Caudal Fin)**

**Ampullae of Lorenzini**

Sand Tiger Shark



**Gills**

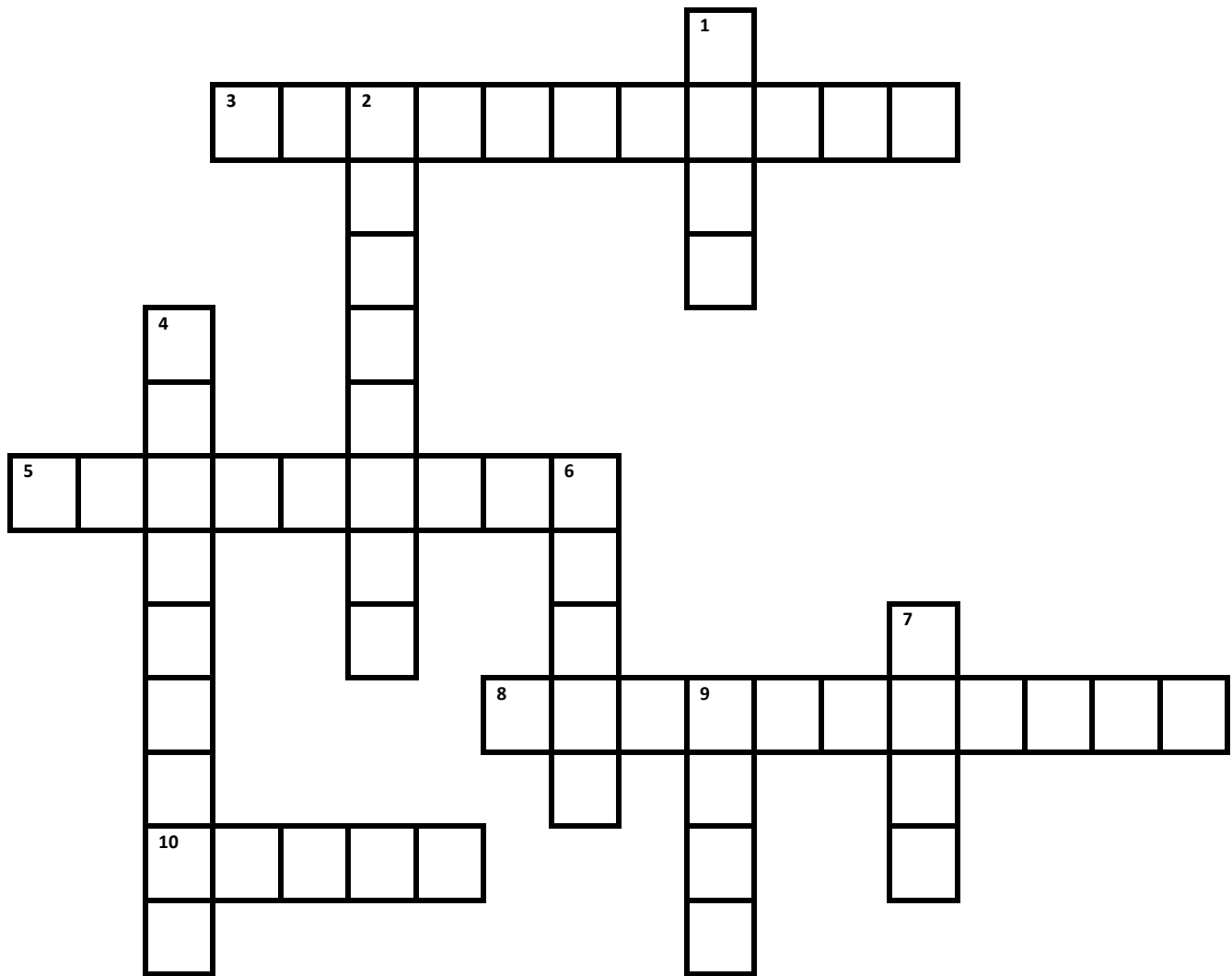
**Pectoral Fin**

1. Look closely at the two sharks, what on their bodies is different between them? Write it out below, or circle or draw an arrow to the differences.

Sharks whose two dorsal fins are almost the same size tend to be slower swimmers, this is the opposite for sharks with 2 different sized dorsal fins as they are fast swimmers

2. Based on dorsal fin size, who is the faster shark in the diagrams? \_\_\_\_\_

# Sharks Crossword



## Across

- 3. The largest shark in the world
- 5. The fin on the back of a shark (two words)
- 8. The fins on the sides of the shark (two words)
- 10. The part of the shark that they breathe with

## Down

- 1. The fastest shark
- 2. The part of the shark sensing electricity, or electroreception
- 4. What a shark skeleton is made of
- 6. The nostrils of a shark
- 7. Relatives of sharks, but with flat bodies
- 9. The other name for the caudal fin