

# Science @Home

## SHARKS

**Hungry for more shark content?**  
You're *fin* the right place. Dip your toes into four days of shark-tastic activities for ages 8-11.

Turn those dog days of summer into shark days with an action-packed roster of 19 hands-on crafts, guided videos, interactive programs, coloring pages, and an ocean-ful of facts about your favorite cartilaginous creatures.

*Please note: While Science @ Home activities are designed to be conducted by kids, some little ones might need adult help with reading instructions and preparing crafts.*

### Day 1: Getting tooth know you

45-60 minutes

- » Shark anatomy puzzle (craft) (en español)
- » Hungry, hungry sharks (video)
- » Swell shark puppet (craft)
- » Shark Scale (activity)

### Day 2: Shark Diversity

30-45 minutes

- » Unusual Sharks (video)
- » Hide & Seek Sharks (coloring) (en español)
- » Shark word search (activity)
- » Creature from the Deep (video)

### Day 3: Weird and Wonderful Sharks

45-60 minutes

- » Sawfish specimen spotlight (video)
- » Shark & Remora puppet (craft)
- » Ninja lanternfish shark (video)
- » 3D bat ray jaw (activity)

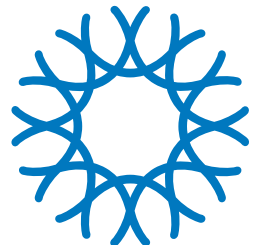
### Day 4: Healthy Sharks, Healthy Oceans

45-60 minutes

- » Food web mobile (craft) (en español)
- » My Shark Tracker (activity)
- » Flipside Science Sustainable Seafood (video)
- » Seafood Watch Guide (resource)

### Kid and caregiver extension activities

- » John E. McCosker: Sharks (video)
- » Advice concerning white sharks (resource)
- » Flipside Science: Preventing Plastic Pollution (video)



# Shark Anatomy Puzzle

What's inside a shark? Sharks have skeletons made of cartilage, the same flexible material that gives structure to our ears and noses. While they have a spine, just like we do, they don't have any ribs! Instead of a bony skull like ours, they have a *chondrocranium* made of cartilage. Cartilage also supports other shark body parts, like gills and fins. Can you figure out how this shark's insides match up with its outline?

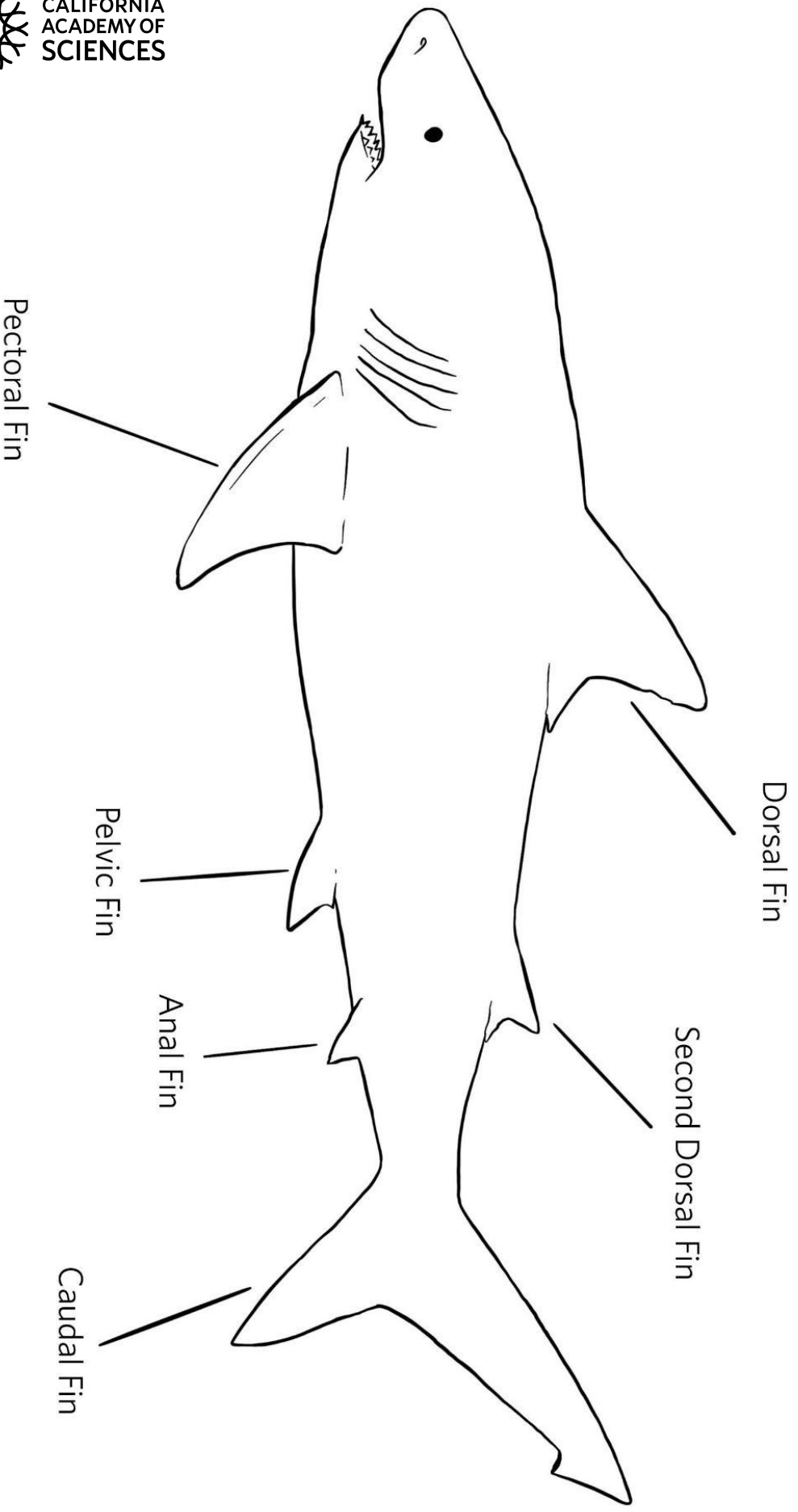
## Materials

Print-out templates (pages 2–3)  
Crayons or colored pencils (optional)  
Scissors

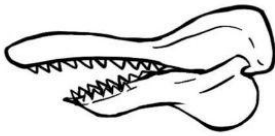
## Directions

1. **Print** the shark silhouette (page 2) and shark anatomy pieces (page 3).
2. *Optional:* **Color** the printed templates.
3. **Read** the labels next to the small anatomy pieces (page 3). Based on the clues, where do you think they belong in the shark's body?
4. **Cut out** the small anatomy pieces (page 3). Do any of the pieces look like they fit somewhere on the shark silhouette?
5. **Assemble** the shark anatomy puzzle by arranging the small pieces on top of the shark silhouette. Some pieces may overlap one another.

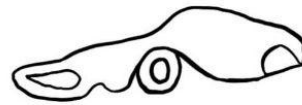
# Shark Silhouette



# Shark Anatomy Pieces



**Jaws:** Known for their many rows of teeth!



**Chondrocranium:** Contains the shark's brain.



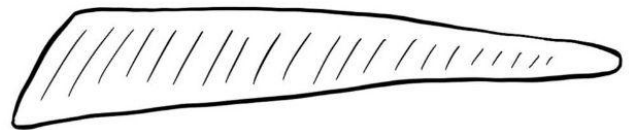
**Gill Arch:** Water enters through the shark's mouth, then passes through the gills, where the shark gets oxygen. This cartilage supports the gills.



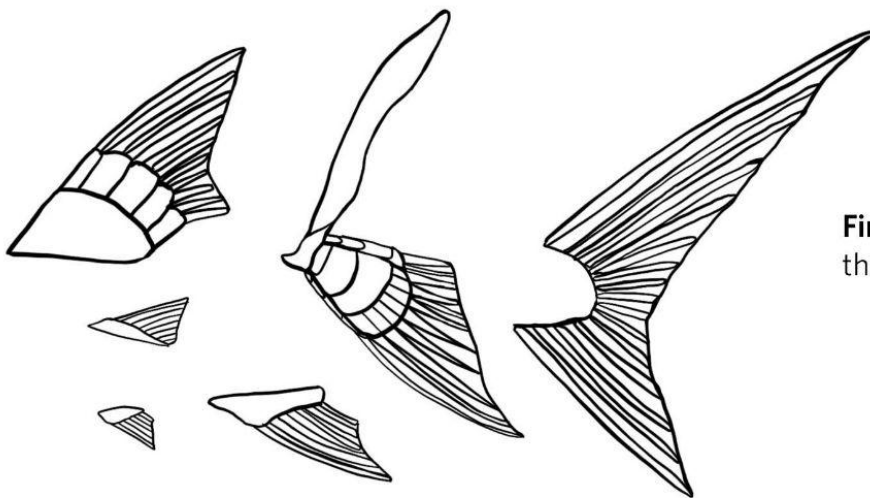
**Stomach and Spiral Valve:** The Spiral Valve is a corkscrew shaped part of some sharks' intestines. Once sharks have digested their food, the waste exits from their cloaca, near the pelvic fin.



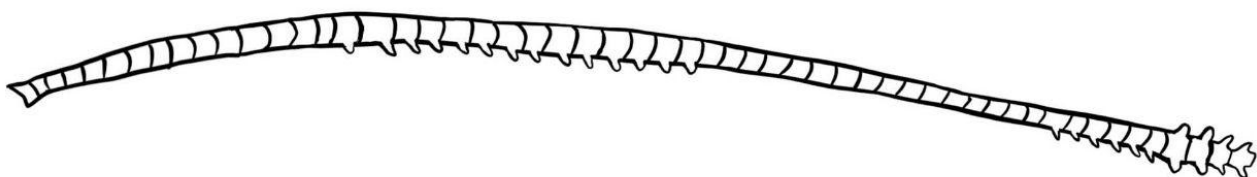
**Heart:** Sharks' hearts are near their gills, similar to how our hearts are near our lungs.



**Liver:** A shark's oily liver helps maintain buoyancy so it doesn't sink or float. The liver has one lobe on each side of the body cavity, right underneath the shark's muscles.



**Fin Cartilage:** Can you match the fins to their outlines?



**Spine:** Made of cartilage, the spine is like a highway for nerves, which send signals between the brain and body.

# Rompecabezas de Anatomía de Tiburones

¿Qué hay dentro de un tiburón? Los tiburones tienen esqueletos hechos de cartílago, el mismo material flexible que da estructura a nuestros oídos y narices. ¡Aunque tienen una columna vertebral, como nosotros, no tienen costillas! En lugar de un cráneo óseo como el nuestro, tienen un *condrocráneo* hecho de cartílago. El cartílago también apoya otras partes del cuerpo de los tiburones, como branquias y aletas. ¿Puedes averiguar cómo coinciden las entrañas de este tiburón con su contorno?

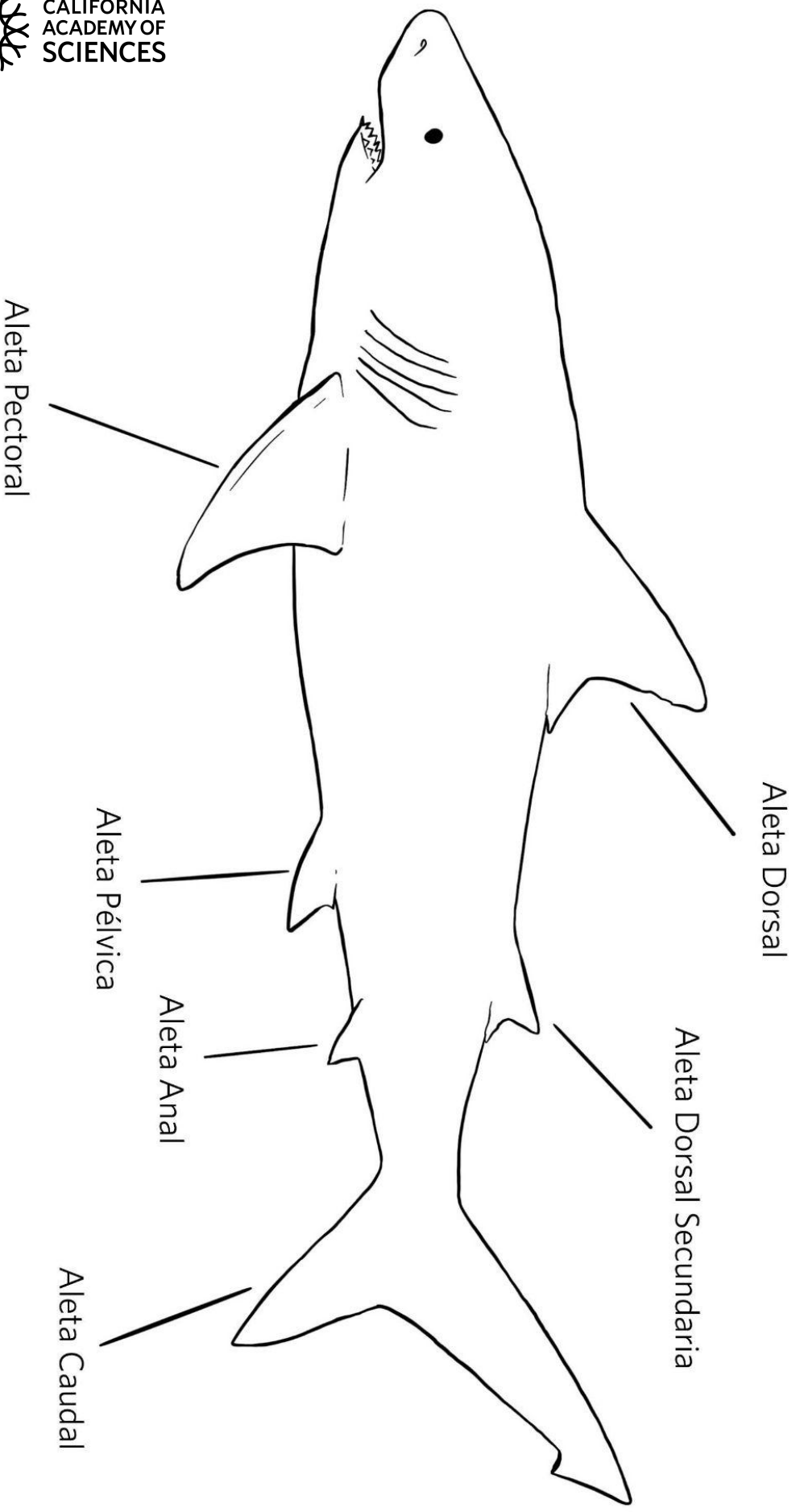
## Materiales

Plantillas de impresión (páginas 2–3)  
Crayones o lápices de colores (opcional)  
Tijeras

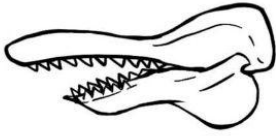
## Instrucciones

1. **Imprimir** la silueta de tiburón (página 2) y piezas de anatomía de tiburones (página 3).
2. *Opcional:* Colorea las plantillas impresas.
3. **Lea** las etiquetas junto a las pequeñas piezas de anatomía (página 3). Basándose en las pistas, ¿dónde crees que pertenecen al cuerpo del tiburón?
4. **Corta** las pequeñas piezas de anatomía (página 3). ¿Alguna de las piezas parece que caben en algún lugar de la silueta del tiburón?
5. **Monta** el rompecabezas de anatomía de tiburones mediante la organización de pequeñas piezas en la parte superior de la silueta de tiburón. Algunas piezas pueden superponerse entre sí.

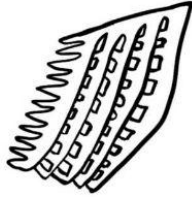
## Silueta de Tiburón



# Piezas de Anatomía de Tiburones



**Mandíbulas:** ¡Conocido por sus muchas filas de dientes!



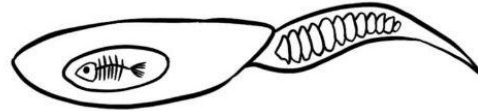
**Arco Branquial:** El agua entra a través de la boca del tiburón, luego pasa a través de las branquias, donde el tiburón obtiene oxígeno. Este cartílago sostiene las branquias.



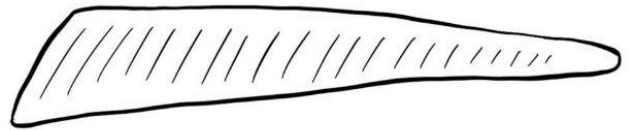
**Corazón:** Los corazones de los tiburones están cerca de sus branquias, similar a cómo nuestros corazones están cerca de nuestros pulmones.



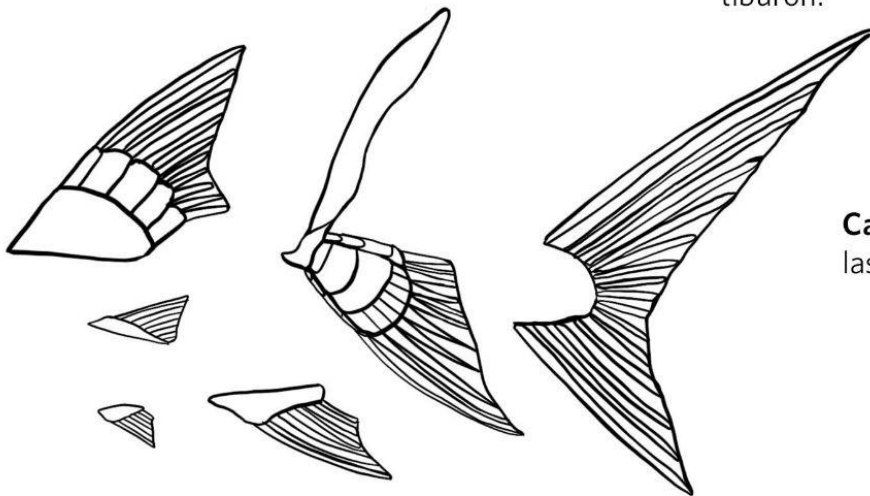
**Condrocráneo:** Contiene el cerebro del tiburón.



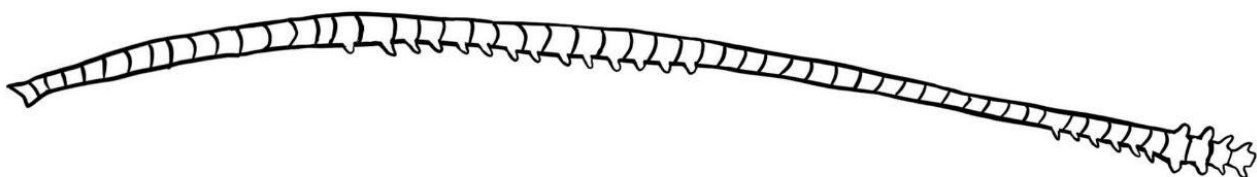
**Estómago y Válvula Espiral:** La válvula espiral es una parte en forma de sacacorchos de algunos intestinos de tiburón. Una vez que los tiburones han digerido su comida, los desechos los residuos salen de su cloaca, cerca de la aleta pélvica.



**Hígado:** El hígado aceitoso de un tiburón ayuda a mantener la flotabilidad para que no se hunda ni flote. El hígado tiene un lóbulo a cada lado de la cavidad corporal, justo debajo de los músculos del tiburón.



**Cartilago de Aleta:** ¿Puedes hacer coincidir las aletas con sus contornos?



**Columna Vertebral:** Hecha de cartílago, la columna vertebral es como una carretera para los nervios, que envían señales entre el cerebro y el cuerpo.



# Swell Shark Puppet

Swell sharks are important predators. They help keep the ocean food web balanced by preying on animals such as fish, molluscs, and crustaceans. Swell sharks hunt by either sucking fish into their mouths, or by resting with their mouths open and letting the current carry the prey in. Celebrate sharks with this paper bag swell shark puppet!

## Materials

Printed templates (page 2)  
Paper bag  
Crayons or colored pencils  
Scissors  
Glue

## Directions

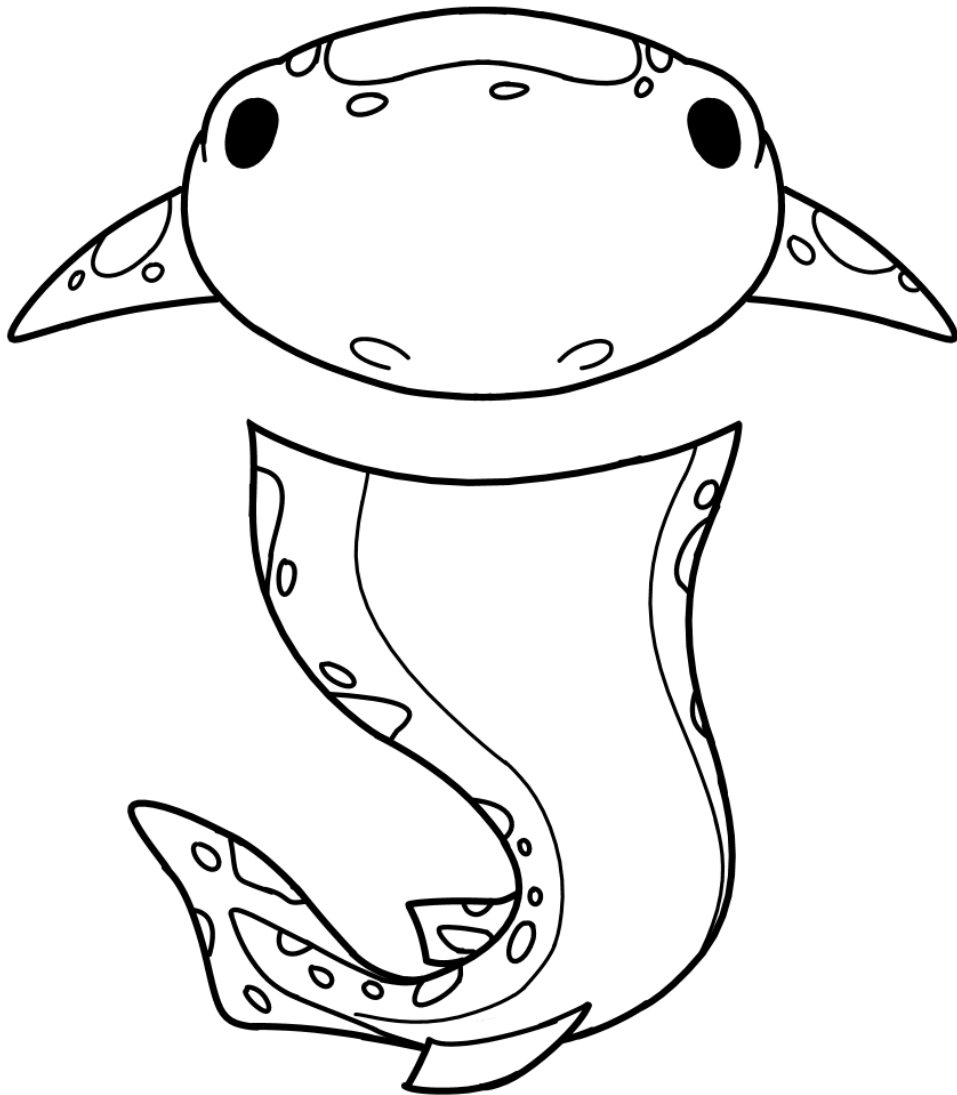
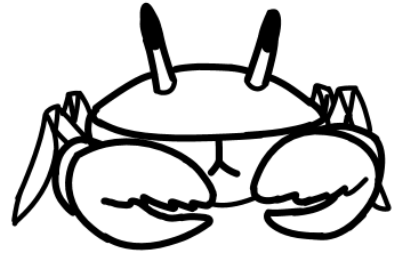
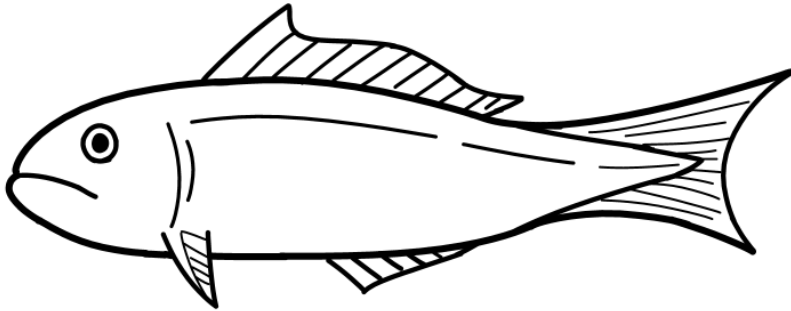
1. **Print** the swell shark puppet and prey template on page 2.
2. **Color** the swell shark head and body and then **cut** it out.
3. **Color** and **cut out** the fish, crab and snail. These will be the swell shark's prey!
4. **Lay** the paper bag on a table so that the opening is pointing toward you and the bottom flap is pointing up toward the sky.
5. **Glue** the swell shark body to the bottom part of the bag. Make sure to tuck the top of the body piece slightly under the flap.
6. **Glue** the head of the swell shark on the flap. Try to match up where the body meets the head.
7. **Animate** your shark! Stick your hand inside the bag and bring your swell shark puppet to life. See if your swell shark can catch and eat the fish you cut out!

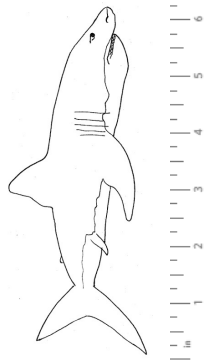






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# Shark Scale

There are over 500 different species of sharks all over the world. Some, like the whale shark, are as big as a school bus. Others, like the dwarf lantern shark, can fit in the palm of your hand. In this activity you will find out which type of California coast shark you are closest to size-wise.

## Materials

Measuring tape or stick, at least 6 feet (1.8 meters) long  
Height recording sheet (print out page 2, or use a blank piece of paper)  
Pen or pencil

## Directions

1. **Measure** your height from head to toe and **write down** your measurement on page 2.  
*Optional: Measure* the height of other members of your household (maybe even a pet dog or cat) and record their heights on page 2.
2. **Compare** your measurements to the lengths of the sharks below. These sharks are commonly found along the California coast.
  - Swell shark:** up to 3 feet (0.9 meters)
  - Horn shark:** up to 4 feet (1.2 meters)
  - Leopard shark:** from 4-7 feet (1.2–2.1 meters)
  - Broadnose sevengill shark:** up to 10 feet (3 meters)
  - Great white shark:** up to 20 feet (6 meters)
3. **Record** on page 2 which of these sharks you are smaller than and which you are bigger than.
4. *Optional: Draw* yourself next to the shark closest in size to you.

## Measurements

My name: \_\_\_\_\_

My height: \_\_\_\_\_

I am **smaller** than a \_\_\_\_\_ shark

I am **bigger** than a \_\_\_\_\_ shark

Name: \_\_\_\_\_

Height: \_\_\_\_\_

They are **smaller** than a \_\_\_\_\_ shark

They are **bigger** than a \_\_\_\_\_ shark

Name: \_\_\_\_\_

Height: \_\_\_\_\_

They are **smaller** than a \_\_\_\_\_ shark

They are **bigger** than a \_\_\_\_\_ shark

# Hide & Seek Sharks

California's coast is home to sharks of all sizes. Can you spot:

**Bat Ray:** Sharks, rays, and skates have skeletons made of cartilage, the flexible material in our noses and ears. This group of fish is called *elasmobranchs*.

**California Moray Eel:** Eels' long bodies are excellent for hiding in rocky reefs, and their scaleless skin produces slimy mucus.

**Giant Kelp:** Kelp forests are important habitats for ocean life along the California coast. Giant kelp has air pockets to keep the leaves near the surface, where the sun is the brightest.

**Great White Shark:** This famous fish has a special type of camouflage called *countershading*. From below, the shark's white belly blends in with the bright sun, and from above the gray back blends in with the darker deep ocean.

**Hammerhead Shark:** Why the long face? Hammerheads' excellent senses and strange snout help them find and catch their favorite prey—stingrays! Hammerheads don't come as far north as San Francisco, preferring the warmer waters of Southern California.

**Horn Shark:** Horn sharks have unique horny spikes at the top of their dorsal fins, and prominent ridges over their eyes.

**Leopard Shark:** Leopard sharks get their name from their large spots and "saddles," the patches that cross their backs. These nocturnal sharks often swim in groups, hunting for food in the mud and sand.

**Ochre Sea Star:** These sea stars can open the shells of their preferred prey, mussels, using tiny tube feet on the bottom of their five arms.

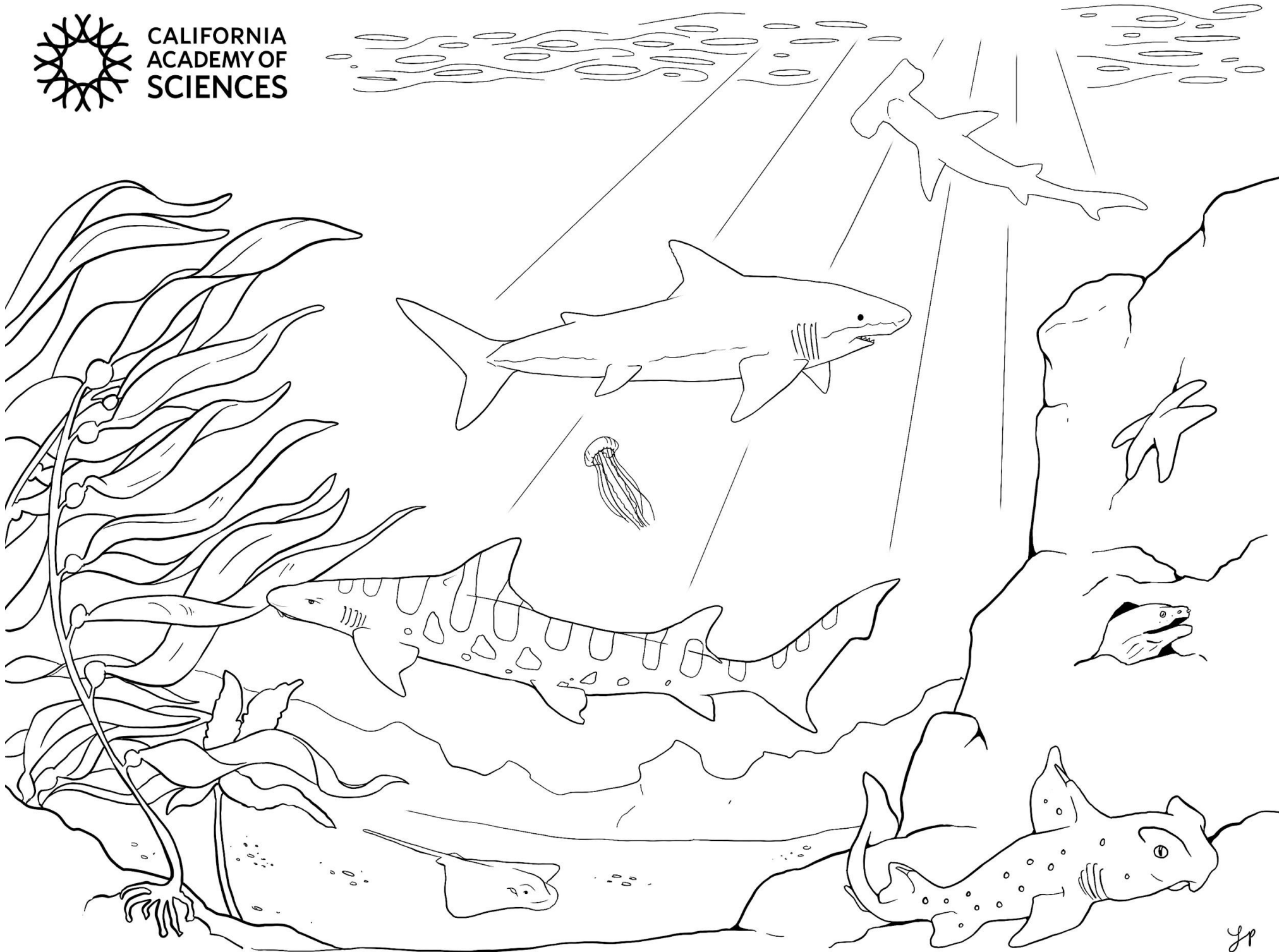
**Pacific Sea Nettle:** Jellyfish use their stinging tentacles to catch their food, like their relatives, coral. Sea nettles are recognizable by their reddish brown color.

Art by Louise Prescott for the California Academy of Sciences.

**Photo references:** "horn shark" by **Ed Bierman** / CC BY 2.0; "Monterey Aquarium - Leopard Shark" by **Martin Holst Friborg Pedersen** / CC BY 2.0



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# El escondite de tiburones

La costa de California es el hogar de tiburones de todos los tamaños. ¿Puedes detectar:

**Murciélago raya:** Los tiburones y rayas tienen esqueletos hechos de cartílago, el material flexible en nuestras narices y orejas. Este grupo de peces se llama elasmobranquios.

**Anguila Moray de California:** Los cuerpos largos de las anguilas son excelentes para esconderse en arrecifes rocosos, y su piel sin escamas produce moco viscoso.

**Algas gigantes:** Los bosques de algas son hábitats importantes para la vida oceánica a lo largo de la costa de California. Algas gigantes tienen bolsas de aire para mantener las hojas cerca de la superficie, donde el sol es el más brillante.

**Gran Tiburón Blanco:** Este famoso pez tiene un tipo especial de camuflaje llamado *contrasombreado*. Desde abajo, el vientre blanco del tiburón se mezcla con el sol brillante, y desde arriba la espalda gris se mezcla con el océano profundo más oscuro.

**Tiburón martillo:** ¿Por qué la cara larga? Los excelentes sentidos de tiburones martillo y su extraño hocico les ayudan a encontrar y atrapar a sus presas favoritas: ¡rayas! Los martillos no llegan tan al norte como San Francisco, prefiriendo las aguas más cálidas del sur de California.

**Tiburón cuerno:** Los tiburones cuernos tienen picos únicos de córnea en la parte superior de sus aletas dorsales, y crestas prominentes sobre sus ojos.

**Tiburón leopardo:** Los tiburones leopardo obtienen su nombre de sus grandes manchas y "sillas de montar", los parches que cruzan sus espaldas. Estos tiburones nocturnos a menudo nadan en grupos, buscando comida en el barro y la arena.

**Estrella marina ocre:** Estas estrellas de mar pueden abrir las conchas de sus presas preferidas, mejillones, usando diminutos pies de tubo en el fondo de sus cinco brazos.

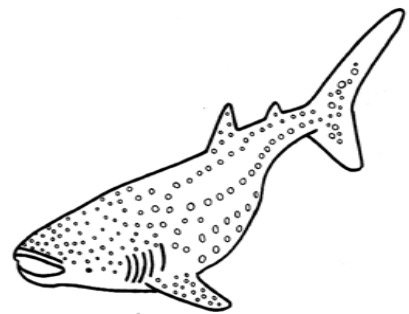
**Ortiga de mar pacífico:** Las medusas usan sus tentáculos punzantes para atrapar su comida, como sus parientes, coral. Las ortigas marinas son reconocibles por su color marrón rojizo.

Art by Louise Prescott for the California Academy of Sciences.

**Photo references:** "horn shark" by Ed Bierman / CC BY 2.0; "Monterey Aquarium - Leopard Shark" by Martin Holst Friborg Pedersen / CC BY 2.0

# Shark Word Search

How many sharks can you find in the word search below? Look up, down, left, right, diagonal, and backwards. Only look for the first part of the shark's name, **bolded** below. For example, when looking for the blue shark, only look for the word **BLUE**.



**BLUE** SHARK

**NURSE** SHARK

**WHALE** SHARK

**HORN** SHARK

**SWELL** SHARK

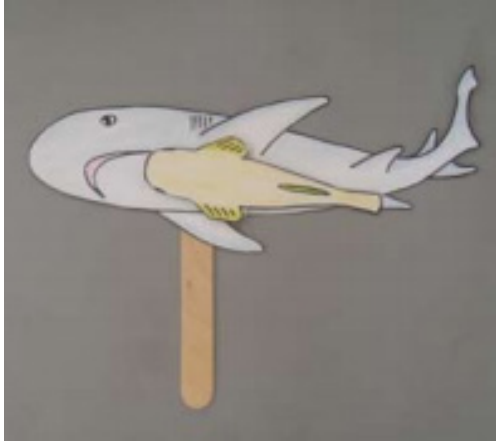
**WHITE** SHARK

**LEMON** SHARK

**TIGER** SHARK

**ZEBRA** SHARK

S	G	U	A	E	J	N	D
M	V	T	T	R	U	J	L
U	W	I	I	R	B	L	K
L	H	H	S	G	E	E	H
W	E	E	A	W	E	O	Z
M	K	M	S	L	R	R	Z
H	S	A	O	N	E	F	Q
B	L	U	E	N	A	O	X



# Shark & Remora Puppet

Sharks and remoras have a symbiotic relationship that benefits both animals: The remora attaches itself to the body of the shark and gives the shark a cleaning in exchange for a free ride across the ocean. Craft your own dynamic shark and remora duo.

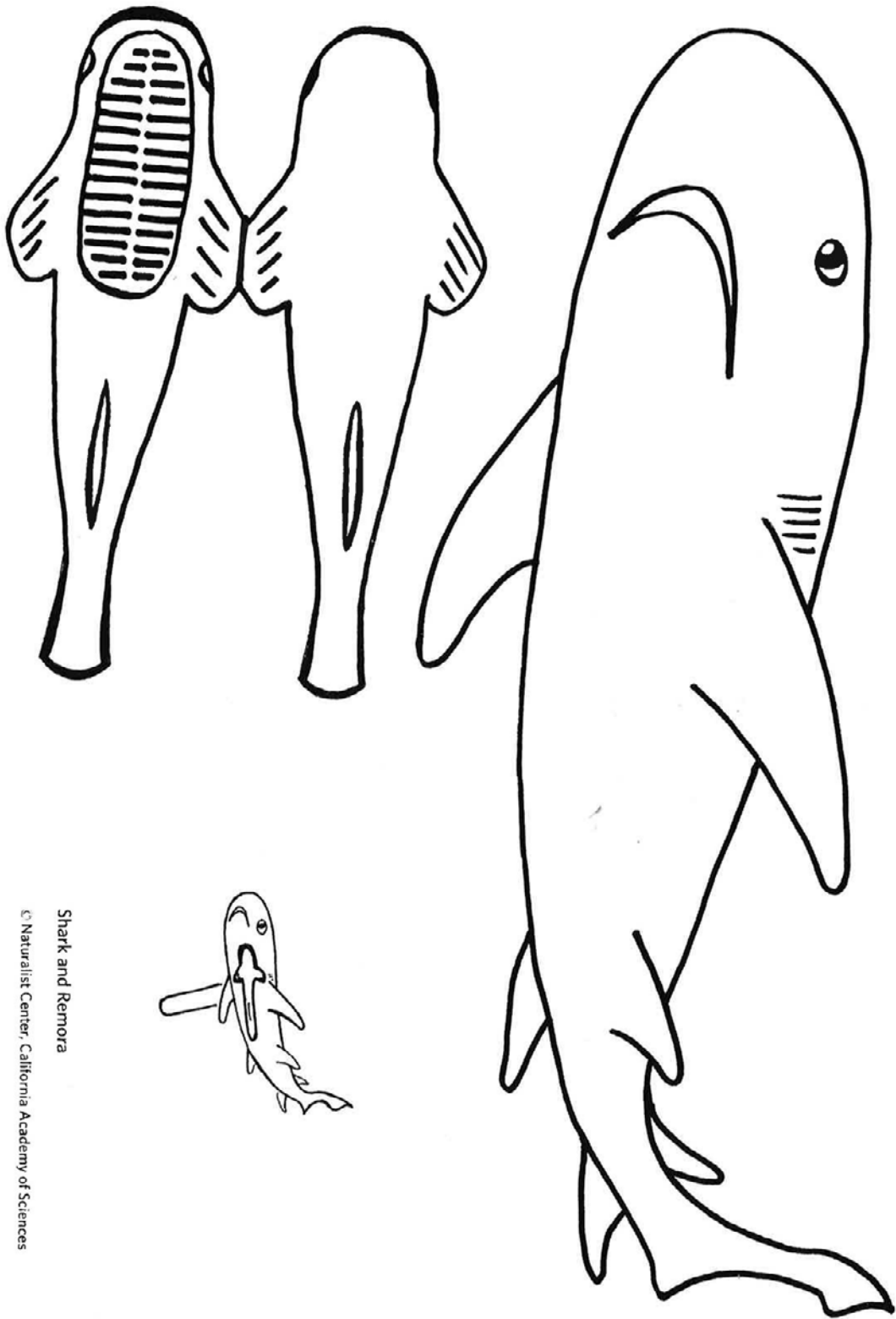
## Materials

Scissors  
Glue  
Craft stick  
Tape  
Shark and remora template (page 2)  
Cardstock or thick paper  
Crayons or colored pencils

## Directions

1. **Print out** the shark and remora templates on page 2.
2. **Color** the shark and the remora.
3. **Cut out** the shark and the remora. Do not cut where the two sides of the remora fin touch.
4. **Fold** the remora along the fin, then **glue** the top and bottom of the remora together.
5. **Fold** a piece of tape into a circle and place anywhere you want on your shark. Remoras usually prefer to attach to the shark's belly or underside.
6. **Attach** the remora to the shark by placing the suction part of the remora onto the circle of tape.
7. **Glue or tape** the craft stick to the back of the shark and take the pair on a journey across the ocean!





Shark and Remora  
© Naturalist Center, California Academy of Sciences



# Food Web Mobile

Who eats who? Create this simplified version of an ocean food web to find out! Sharks are carnivores, so they get energy by eating other animals. Predators like sharks help keep prey populations balanced. If a prey population gets too big, they might deplete their own food source. Food webs can show us how everything is connected.

## Materials

1 clothes hanger (or a straight rod, like a chopstick or a skewer)

Crayons, or colored pencils

String (yarn)

Scissors

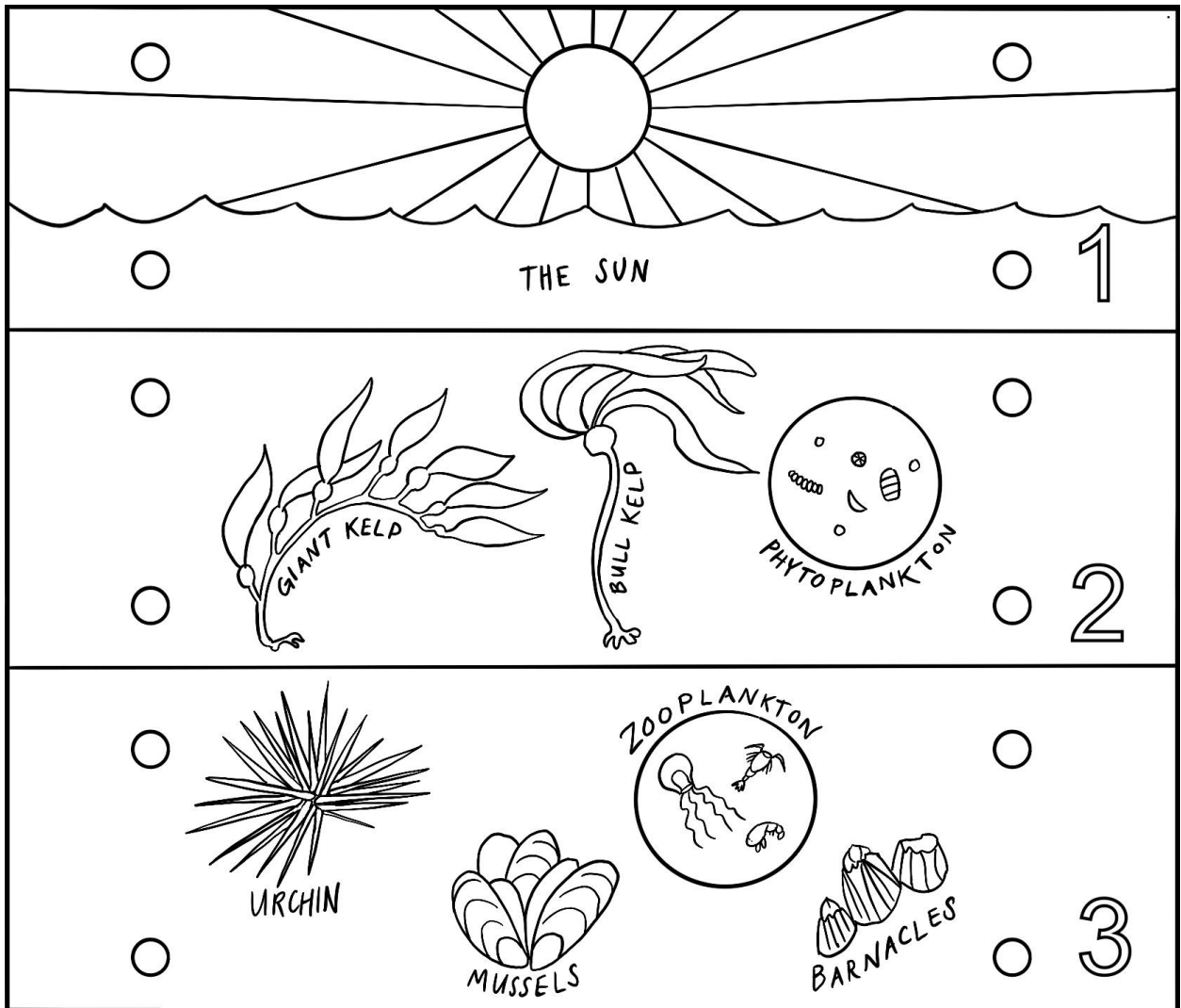
Print-out templates (pages 2–3)

Hole punch (optional)




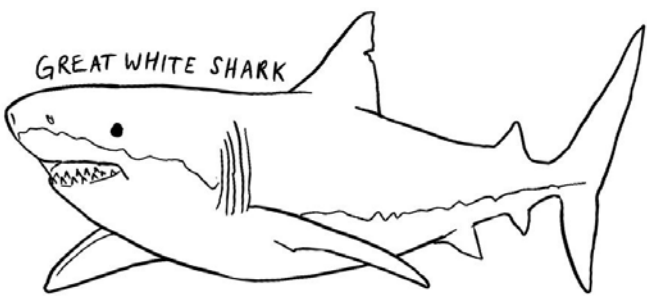
Tape (optional)

## Directions

1. **Print** the templates on pages 2-3.
2. **Color** the ocean life. Do you recognize any of the animals? What do you think they like to eat?
3. **Cut out** each rectangle template. Then, **punch out** the holes using a hole puncher or pencil.
4. **Cut** 14 pieces of string to about 6 inches long (or about the length of your hand).
5. **Line up** the templates by number with 1 at the top and 6 at the bottom, then **tape** or tie them together with string. Energy in the food web flows from the sun to plants, then to animals who eat plants, then to animals who eat other animals. Where do you get your energy from?
6. **Tie** the food chain to the clothes hanger with the last two pieces of string.
7. **Hang** your mobile. Where can you find sharks in the food web? Are they predators, prey, or both? How do sharks help keep the ocean healthy?





<input type="radio"/>	 <p>SEA STAR</p>	<input type="radio"/>	
<input type="radio"/>	 <p>SWELL SHARK</p>	<input type="radio"/>	4
<input type="radio"/>	 <p>CALIFORNIA SEA LION</p>	<input type="radio"/>	
<input type="radio"/>	 <p>GREAT WHITE SHARK</p>	<input type="radio"/>	6



# Red alimenticia móvil

¿Quién come quién? ¡Crea esta versión simplificada de una red de comida oceánica para averiguarlo! Los tiburones son carnívoros, así que obtienen energía comiendo otros animales. Depredadores como los tiburones ayudan a mantener equilibradas las poblaciones de presas. Si una población de presas se hace demasiado grande, podría agotar su propia fuente de alimento. Las redes de alimentación pueden mostrarnos cómo todo está conectado.

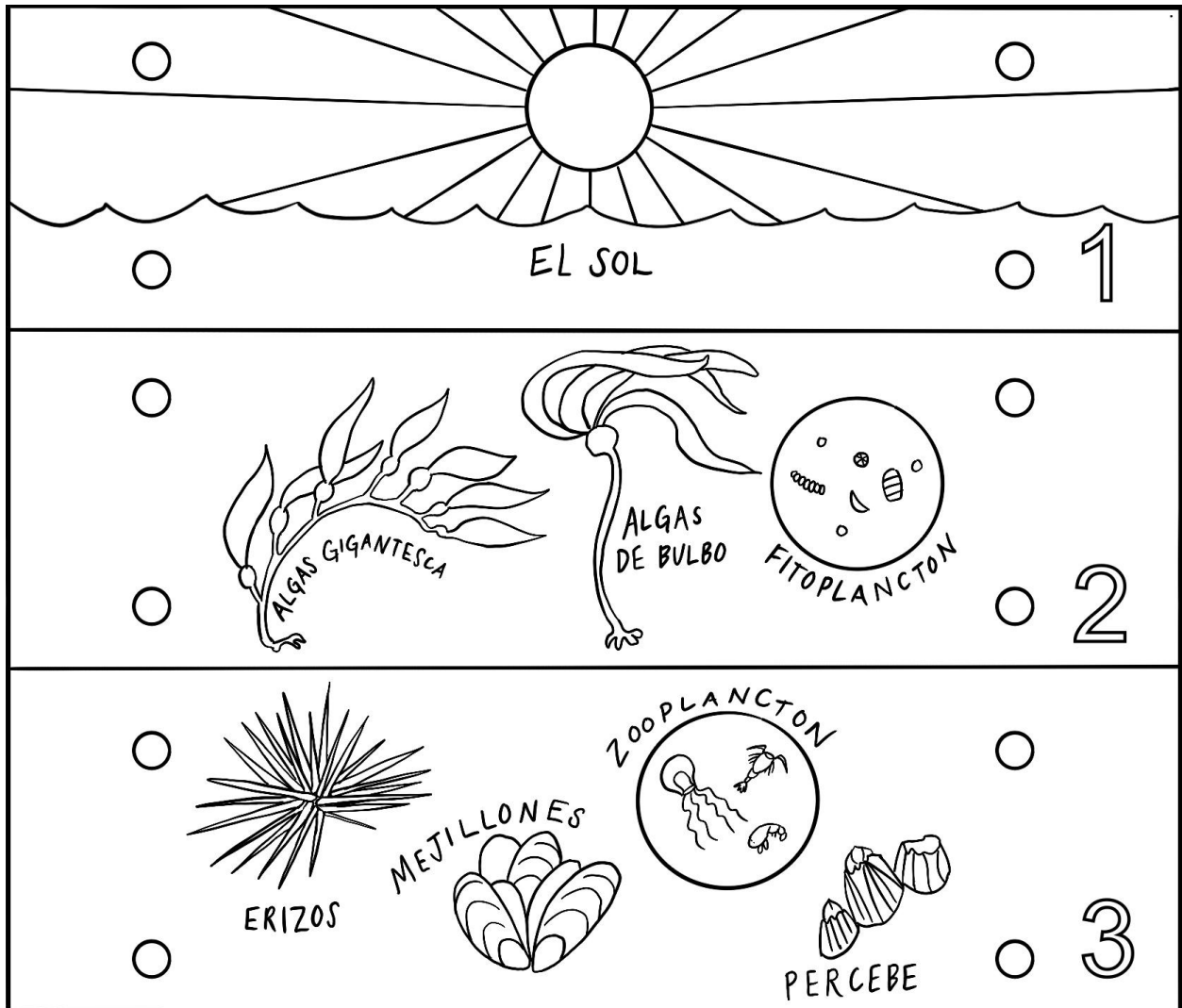
## Materiales

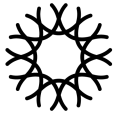
- 1 percha de ropa (o una varilla recta, como un palillo o un pincho)
- Crayones, o lápices de colores
- Hilo (cuerda)
- Tijeras
- Las plantillas de impresión (página 2–3)
- La perforadora (opcional)
- Cinta adhesiva (opcional)





## Instrucciones

1. **Imprime** las plantillas en las páginas 2-3.
2. **Colorea** la vida del océano. ¿Reconoces alguno de los animales? ¿Qué crees que les gusta comer?
3. **Corta** cada plantilla de rectángulo. A continuación, **perfora** los agujeros usando un perforador de agujeros o lápiz.
4. **Corta** 14 piezas de hilo a unas 6 pulgadas de largo (o aproximadamente la longitud de tu mano).
5. **Línea** las plantillas por número con 1 en la parte superior y 6 en la parte inferior, luego pegarlas o atarlas con cadena. La energía en la red de alimentos fluye del sol a las plantas, luego a los animales que comen plantas, luego a los animales que comen otros animales. ¿De dónde sacas tu energía?

6. **Amarra** la cadena alimenticia a la percha de ropa con los dos últimos trozos de hilo.
7. **Cuelga** tu móvil. ¿Dónde puedes encontrar tiburones en la red alimenticia? ¿Son depredadores, presas o ambos? ¿Cómo ayudan los tiburones a mantener el océano saludable?





<input type="radio"/>	ESTRELLA DE MAR 	<input type="radio"/>
<input type="radio"/>	 TIBURÓN INFLADO	<input type="radio"/>
		4
<input type="radio"/>		<input type="radio"/>
<input type="radio"/>	 LEÓN MARINO DE CALIFORNIA	<input type="radio"/>
		5
<input type="radio"/>	GRAN TIBURÓN BLANCO 	<input type="radio"/>
		6



# My Shark Tracker

Have you ever wondered what a shark is doing *right now*? At this very moment, sharks all over the world are swimming, sleeping, eating, and hiding. Sharks are essential to keeping our oceans balanced and healthy.

Our future depends on healthy oceans, and so our future depends on sharks. Scientists are working to collect important information about sharks and where they travel using special tags that send information, or *pings*, every time a shark's fin breaks the surface. The more we know about sharks, the better we can protect them.

You can be a shark tracker, too! With an adult's permission, visit Oearch Shark Tracker at [www.oearch.org/tracker](http://www.oearch.org/tracker) or download the app and choose a shark to follow. Then, use the worksheet below to learn more about your shark.

**Shark's name:** \_\_\_\_\_

**Shark species** (what kind of shark is it?): \_\_\_\_\_

**Life stage** (how old is it?), circle one:

Young of year

Juvenile

Sub-adult

Adult

**Draw your shark:**



### Track your shark

1. Where does your shark swim? Color the areas that your shark has traveled on the map below.
2. Under "Filter Track By," check where your shark was all year, for a week, or on your birthday.
3. Check in on your shark! Where is it next week, or next month?



What is your wish for this shark?

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# Healthy Oceans Sustainable Seafood Vocabulary for Students



- **Aquaculture:** The farming of water organisms.
- **Bycatch:** Any fish or other organism that is unintentionally caught. These items are often wasted.
- **Farmed fish:** Fish that are raised for commercial purposes, usually for food. Fish can be farmed in a variety of environments, including self-contained tanks or enclosures in the open ocean.
- **Food chain:** A series of events in which one organism eats another and obtains energy.
- **Food web:** The pattern of overlapping food chains in an ecosystem.
- **Gillnet:** A wall of netting that hangs vertically in the water and catches fish that try to swim through by the gills. Gillnets can unintentionally entangle a variety of marine animals, including sea turtles, whales, and dolphins.
- **Longline:** A central fishing line that can range from one to 50 miles long and strung with smaller lines of baited hooks, dangling at evenly spaced intervals. The many lines, however, can hook bycatch that are attracted to the bait.
- **Mercury:** A toxic heavy metal that can enter the environment and contaminate water sources from human activities like coal burning. In the ocean, mercury is absorbed into the bodies of fish and accumulates in fish higher up in the food chain.
- **Purse seining:** A method of fishing that uses a large wall of netting to encircle schools of fish. There are several types of purse seines and, depending on which is used, some can catch other animals.
- **Sustainable:** Meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- **Trawling:** A method of fishing using nets towed at various depths to catch fish or shellfish. Trawl nets, which can be as large as a football field, are either dragged along the seafloor or midway between the floor and the surface. Bottom trawling can result in high levels of bycatch.

