



# Let's go on a FIELD TRIP to the



**Have you ever visited a museum or science center  
and at the end of the day wondered if your child learned *anything*?**

This packet is your in-depth, science-based tour you can use to experience this world-class aquarium at your own pace, to really get the most out of your visit.

For kids of all ages! If you love dolphins, turtles, and jellyfish AND you're interested in anything that swims, moves, or crawls in the sea, this is the packet you need to really enjoy your day at the Monterey Bay Aquarium. Start on page 4.

HINT: If you cannot visit the aquarium but would like to use this packet, visit the [Monterey Bay Aquarium website](#) and complete pages 2 – 3 using the online exhibits from the website.

FINE PRINT: This packet is available free to students worldwide. Images in this packet were taken by me during my visit to the aquarium except when noted. Information about each animal provided by the NOAA. You may not copy this packet and charge for it. Activity content © Supercharged Science.

## Scavenger Hunt List (ONLINE FIELD TRIP)

### CAN YOU FIND:

- |                                                                  |                                                                                 |
|------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <input type="checkbox"/> kelp more than 10 feet long             | <input type="checkbox"/> largest fish in the aquarium                           |
| <input type="checkbox"/> star fish with more than 5 arms         | <input type="checkbox"/> puffin                                                 |
| <input type="checkbox"/> black rock with a white stripe          | <input type="checkbox"/> glowing jelly                                          |
| <input type="checkbox"/> sheephead                               | <input type="checkbox"/> dogfish                                                |
| <input type="checkbox"/> seahorse                                | <input type="checkbox"/> hold a sea urchin                                      |
| <input type="checkbox"/> bat ray (extra points if you touch it!) | <input type="checkbox"/> any type of crab                                       |
| <input type="checkbox"/> animal that feeds on algae              | <input type="checkbox"/> find something that might be a creature's home one day |
| <input type="checkbox"/> barnacle                                | <input type="checkbox"/> ten pieces of manmade garbage                          |
| <input type="checkbox"/> eel in a hidey hole                     | <input type="checkbox"/> filter feeding animal                                  |
| <input type="checkbox"/> sea turtle                              |                                                                                 |

### FIND AN ANIMAL THAT:

1. Wears anything that it can reach
2. Has one eyeball that migrates to the other side of its head during its growth stage
3. Lights up like a Christmas tree, normally (mostly) transparent
4. Swims in fast, tight circles to create a whirlpool of plankton they can sweep up with their bill, has a red neck, short tail and bright colors
5. Has spots like a cheetah
6. Eats anything dead or injured or slow
7. Lives in kelp and climbs back to its spot if it gets knocked off, eats algae, has a shell (*image right*)
8. When prey is in range, it shoots out two tentacles, is able to camouflage itself and hide behind clouds of ink (*related to the squid and octopus*)



(c) Monterey Bay Aquarium

*decorator crab, flat fish, comb jelly, red phalarope, leopard shark, kelle's whelk, jeweled snail, cuttlefish*

## Monterey Bay Aquarium Website

### Scavenger Hunt List (ONLINE FIELD TRIP)

(CONTINUED FROM PAGE 2)

FIND A PLANT THAT:

1. Has dark, spongy fingers that dangle from sides of rocks and is a host to small red algae (*image right*)



(c) Monterey Bay Aquarium

2. Can live in salty soil without wilting; takes the salt in and sweats it out leaving crystals on its blades for the rain to wash away.

3. Every cell that contains a tiny pocket of sulfuric acid to discourage grazing fishes

4. Grows and thrives in rough and tumble coastal waters, has a flexible stem (stipe) that extends 60 feet with ends in a single round float, and grows 10 inches a day, and look like bull whips.

5. Is a marsh plant and one of the few flowering plants that grow in the ocean, looks very similar to a pipefish without the eyeballs (*image right*)



(c) Monterey Bay Aquarium

6. Grows faster than bamboo (2 feet a day), and is held upright by gas-filled bladders at the base of the leaf-like blades. Grows up to surface and spreads across top of water to form a canopy. Can be nearly 200 feet long.

7. Looks like coral but tastes like marble to sea creatures. This is a type of algae has limestone in their cell walls and has branches and grows on rocks. (*image right*)



(c) Monterey Bay Aquarium

*dead man fingers, salt grass, acid seaweed, bull kelp, eelgrass, giant kelp, red coralline algae*

Go to LAST PAGE for a **FREE** one-hour **Marine Biology** online class!

# The Leopard Shark (Kelp Forest)

The Leopard Shark averages about 1.5 meters (5 feet) in length, females are about 30 cm (one foot) longer. They are more active at night, and are commonly spotted cruising just beyond the *surf zone* (where the waves start to break).

Their red blood cells (red blood cells contain a protein called hemoglobin, which carries oxygen from the lungs to all parts of the body) are smaller and more numerous than in other species, which means they can process oxygen more efficiently from the water.

Write down at least three *more* things you learned about the Leopard Shark (other than the information provided above) by either watching and observing, asking questions from the staff, or by reading the information posted.



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# The Giant Pacific Octopus (Deep Reef)

The Giant Pacific Octopus is the largest species of octopus (up to 72kg / 160 lbs) with a radial span of 6 m (20 feet). You'll find the Giant Pacific Octopus in the intertidal zone (the area above water level at low tide and underwater at high tide) down to 2,000 m (6,600 feet), as this sea creature prefers the cold, oxygen-rich waters at this depth.



The ability to camouflage themselves to match their surroundings helps the Giant Pacific Octopus avoid predators such as seals, otters, sperm whales and people. They typically live 3-5 years in the wild.

They are ranked as one of the most intelligent invertebrates. This octopus has demonstrated the ability to recognize humans that they have frequent contact with. They can also solve simple problems like unscrewing tops of bottles to get at the food inside. They have the ability to use tools to get a job done, like opening tank valves, disassembling expensive equipment that scientists are using and wreaking general havoc in both labs and aquariums.

Write down at least three *more* things you learned about the Giant Pacific Octopus (other than the information provided above) by either watching and observing, asking questions from the staff, or by reading the information posted.

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# The Spot Prawn (Deep Reef)

*Prawn* is a common European name for small marine crustaceans that have an exoskeleton and ten legs. In the US, we use the term *shrimp* to mean *prawn*.



The Spot Prawn is the largest shrimp on the Pacific coast, and although it hides 200 m (700 feet) down in rocky reefs and caves, it is a favorite food of both local fish and people.

Find a prawn and draw a picture below (Hint: you will observe more details when you physically draw it, no matter what your drawing skills are like. This is just for you, so have fun with it!)

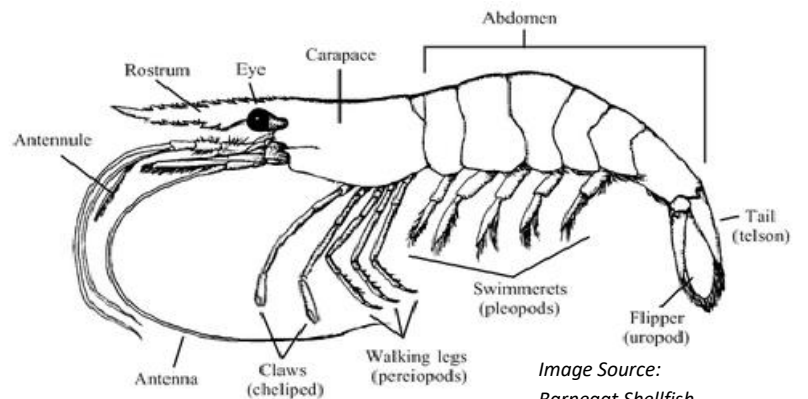


Image Source:  
Barnegat Shellfish

What else do you notice about the Spot Prawn's (or another species of prawn) behavior?  
What is it doing (or trying to accomplish), and how is it using what it's got (legs, eyes, antennae...)?  
Can you add any of this information into your drawing above?

## Flat Fishes (Sandy Sea Floor)

There are over 800 flat fishes that belong to the ray-finned demersal fish order *Pleuronectiformes*.

Some flat fish camouflage themselves to match the ocean floor. Flat Fishes are found all over the world, from the Arctic to Antarctica, mostly near the surface to a depth of 500 meters (1,640 feet).

The most amazing characteristic of some flat fishes is their asymmetry: both eyes on the same side of the head in the adults. Some of these have both eyes on one side of the head, one eye migrating to the other side during development. Some species have eyes on the left side, others have eyes on the right. Not all flat fish have both eyes on the same side (example: halibut, sole, flounders...)



Flat Fishes measure from the tiny 4.5 cm (1.8 inch) 2-gram species to the Atlantic halibut measuring 2.5 meters (8.2 feet) and 316 kg (700 lb).

Write down at least three *more* things you learned about Flat Fishes (other than the information provided above) by either watching and observing, asking questions from the staff, or by reading the information posted.

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Pick your favorite flat fish. Does it have eyes on (circle one):

right side

left side

both sides

Original file:

<https://www.SuperchargedScience.com/MBAQ>

## The Giant White Plumed Anemone (Deep Reef)



The Giant White Plumed Anemone is a species of sea anemone found in the eastern Pacific Ocean from Alaska to Catalina Island (California). This species reaches one meter (39 inches) fully extended and can retract into a ball of 25 cm (10 inches) in diameter.

One anemone will naturally clone itself by making copies of its cells to create a colony of anemones. Their main predator is the starfish, which prefers the smaller anemones to the larger ones.

Write down at least three *more* things you learned about the Giant White Plumed Anemone (other than the information provided above) by either watching and observing, asking questions from the staff, or by reading the information posted.

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Count up the anemone in the real tank at the aquarium.

- How many are there?
- What do you estimate the size is of the largest?
- Estimate the size of the smallest?





## Rockfishes (Deep Reef)

Rockfish is a common name for several species of fish, such as grouper, stonefish, bull huss, and striped bass. They all have in common a tendency to hide in rocks, and usually *rockfish* refers to the species of fish eaten by people.



How many different rockfish (look for differences in shape, coloring, and size) do you notice in the same aquarium tank of rockfish?

Write down at least three *more* things you learned about Rockfish (other than the information provided above) by either watching and observing, asking questions from the staff, or by reading the information posted.

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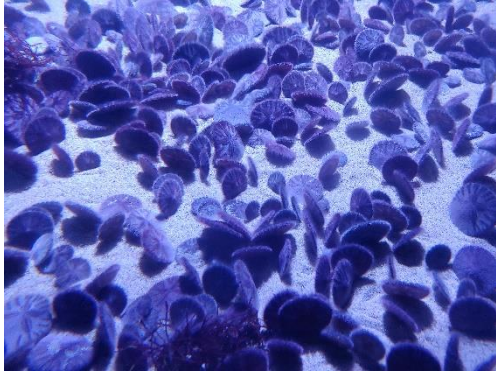
Draw your favorite rockfish here and label three distinct things about your rockfish to help identify it from other species (refer to example) →

### Black Rockfish<sup>†</sup>



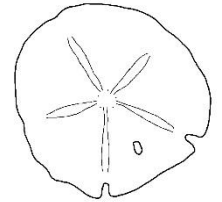
Large mouth. Body mottled with gray. White belly. Black spots on the dorsal membrane.

## Sand Dollar (Sandy Sea Floor)



Did you know that Sand Dollars are also called *Sea Cookies*, *Sand Cakes*, *Pansy Shells* (in South Africa), and *Snapper Biscuits* (in New Zealand) ? They are a species of flat sea urchins that burrow in the shallow depths of the ocean floor.

Usually 3-4 inches (7-10 cm) in diameter, they have a petal-pattern of five paired rows of pores in radial symmetry.



The rigid skeleton is made of calcium carbonate (egg shells and chalk are also made of calcium carbonate), covered with velvety-soft layer of spines covered with hair. Sand dollars move by coordinating movement of the spines. The small hairs may be green, blue, or purple.

The mouth of the sand dollar is on the underside right in the center of the petal pattern. They eat algae and carbon-matter on the ocean floor that it encounters by creeping along. Some species even tip up on their side to better catch floating tidbits in currents.

When threatened, sand dollar larvae will clone themselves by splitting in half, which doubles their population and halves their individual size to increase their chances of not being detected by larger fish (although this doesn't seem to be as effective against smaller predators like crustaceans).

The sand dollars we find on the beach are the remains after the sand dollar dies (the spines fall away) and the exoskeleton has been bleached white by the sun.

Find three different sand dollars and draw their radial symmetry here, paying particular attention to any differences you notice between your three choices.

Two vertical lines defining a space for drawing the radial symmetry of three different sand dollars.

## Barnacles (Wharf)



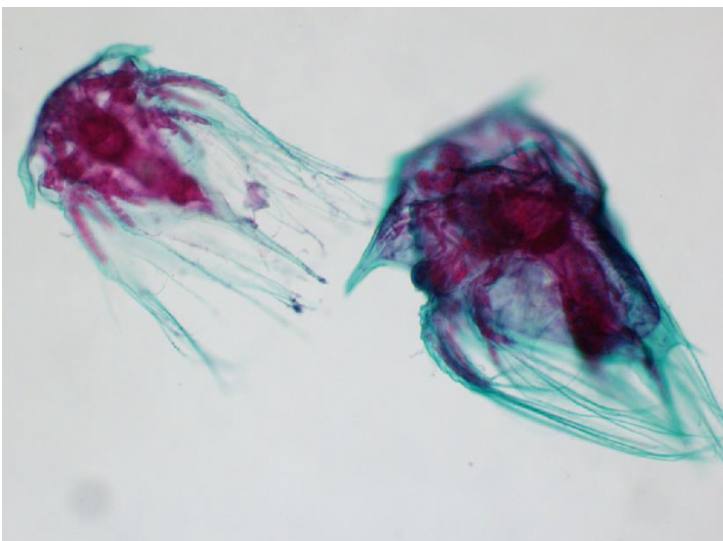
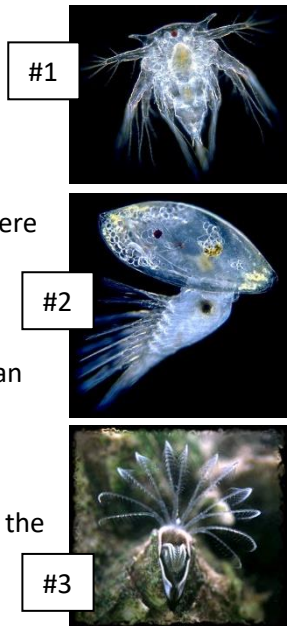
Barnacles are a type of arthropod (invertebrate animal with an exoskeleton, segmented body, and paired jointed appendages). Barnacles are related to crabs and lobsters and are exclusively marine, living in shallow waters and tidepools.

There are over 1,400 species of barnacles, the most common is the *acorn* barnacle. If you've ever maintained a boat, you know that removing barnacles requires a lot of work and sometimes a pressure washer. (The US Navy reports that heavy barnacle growth on ships increases weight and drag by 60%, which results in a 40% increase in fuel consumption!) Barnacles like places with lots of activity like underwater volcanoes and areas where the ocean meets the land between high and low tides.

The first stage in the life of a barnacle (larvae), notice they have two little 'horns' (#1). After this stage, it undergoes a surprising transformation (#2) into a survival capsule, and remarkably it does not eat (it actually *can't* take in food at all). It has enough energy in this stage for only 13 days to find a secure spot to attach itself where it will live out the rest of its life.

As soon as it attaches itself (#3), it takes only 12 hours to make a shell and there it stays, head down, inside a shell with its own little watery environment inside so it can survive low tide.

You peek through a microscope and see the image of the barnacles as shown below (it's a real image). Are these two barnacles in phase #1, #2, or #3? Can you estimate the approximate size of each barnacle?



Magnification: 100x

Width of image: 800  $\mu\text{m}$   
( $\mu\text{m}$  = microns or  
"one millionth of a meter")

Original file:

<https://www.SuperchargedScience.com/MBAQ>

## Bat Ray Touch Pool (Sandy Shores)

The Bat Ray is one of the most graceful creatures with wingspans between 4 to 8 feet (1.2 - 2.5 meters), weighing up to 200 pounds (90 kg), and living up to 24 years. Female bat rays grow larger, swim faster, and live longer than males. Bat rays live in kelp beds, muddy and sandy sloughs and bays.



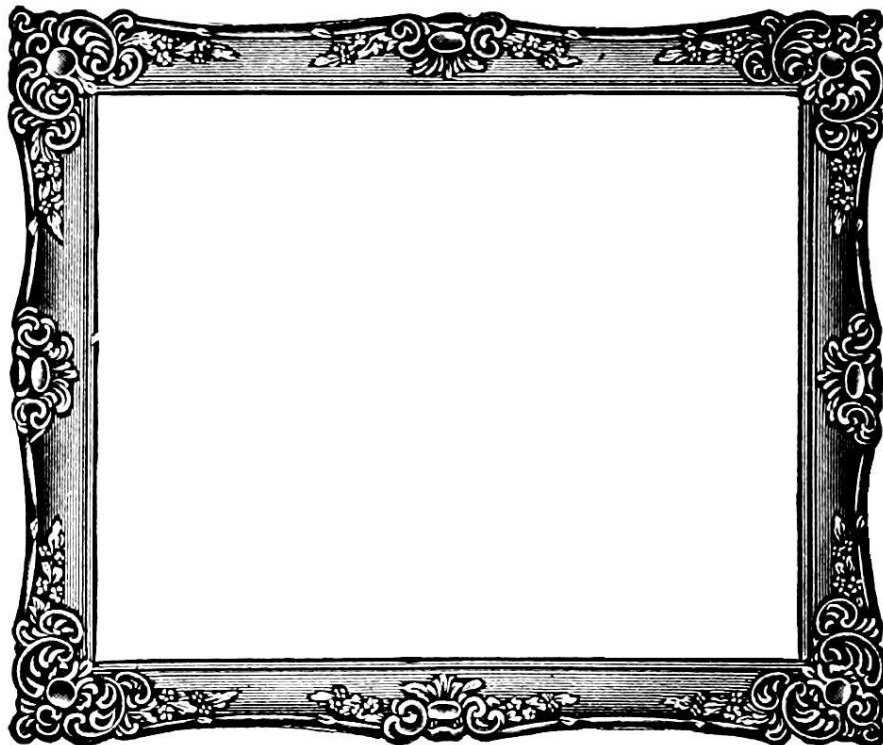
Bat rays can have one to three barbed spines filled with venom near the base of its tail. Most people stung by bat rays accidentally stepped on them, as the bat rays like to camouflage

themselves by burrowing in the sand to be safe from predators. It's best to shuffle your feet when in the sand if you are concerned about being stung (they only use it when frightened or attacked).

Their teeth are flat and used more for grinding and crushing. Bat rays feed mostly on mollusks and crustaceans. They use their wings to uncover and expose prey hiding buried in the sand.

Go find the Bat Ray Touch Pool and see if you can wiggle your way up to the front. Be sure your hands are clean before you stick them in the water. When the bat ray swims close, use a gentle touch on the wing. Be patient and watch how the bat ray swims, glides and turns in the water.

Insert a photo of you and the bat ray below!



Original file:

<https://www.SuperchargedScience.com/MBAQ>

## Sea Otters

The Sea Otter is the smallest marine mammal, related to the weasel family. It has incredibly dense thick fur (instead of blubber) to maintain a 100°F (37°C) body temperature.

The fur is in two layers: the outer layer can lay perfectly flat against its body and has more than a million fibers per square inch (humans: ~900 per square inch). The inner hair layer stays completely dry.



Their forepaws are incredibly deft with retractable claws and tough pads on their palms to help with gripping. Under each forearm is a pocket of loose, baggy skin where favorite rocks (for cracking open and clams) and also food can be stored.

Did you notice the forelegs? They are webbed and sort of look like flippers, and the last digit is longest, which makes swimming on its back easy but walking is really awkward. Their muscular tails are used for steering and swimming (see if you can notice this when they move in the water).

They have good eyesight both in and out of the water, smell and hear well very well out of the water. Both nostrils and ears close when underwater, and their whiskers sense vibrations in the water which comes in handy when hunting for dinner.

Their body is very buoyant (able to rise to the top of a liquid or gas) due to both air being trapped by the fur hairs and also their very large lung capacity (2.5 times greater than other animals of the same size).

**Activity: Spelling bee!** Give this paper to a parent to say these words (below) out loud.

How many you can spell quickly and easily?

- |                                     |                                      |
|-------------------------------------|--------------------------------------|
| <input type="checkbox"/> Mammal     | <input type="checkbox"/> Nostril     |
| <input type="checkbox"/> Marine     | <input type="checkbox"/> Capacity    |
| <input type="checkbox"/> Foreleg    | <input type="checkbox"/> Retractable |
| <input type="checkbox"/> Awkward    | <input type="checkbox"/> Fahrenheit  |
| <input type="checkbox"/> Vibrations | <input type="checkbox"/> Celsius     |
| <input type="checkbox"/> Muscular   |                                      |
| <input type="checkbox"/> Buoyant    |                                      |

## Sardine Carousel (Open Sea)

Sardines look silver, but if you look close you'll find they are blue-green on their backs and have white flanks with 1-3 sets of dark spots along the middle.

Pacific sardines are fast growing and can grow longer than a ruler (12 inches). They can live up to 13 years, but it's usually less than five years due to overfishing. They feed on plankton (tiny floating plants and animals) and are prey themselves to many kinds of fish, marine mammals and seabirds.

They like to live in large, dense schools near the surface of the ocean, and they move seasonally along the coast. You'll find them from Southeastern Alaska to Baja California, Mexico.



Stand in the center of the Sardine Carousel (right at the entrance of the Open Sea) and complete these two tasks:

1. **How many sardines do you estimate to be in the carousel?** (Hint: Take a picture of a section and count up the number of fish in the shot, and then estimate how many of shots you'd need for a complete panorama). You don't have to count up all the fish in the entire image, you can take a sample section and then multiply it out.

*Example: In the image above, I estimate about 75 in the top one-quarter of the image, making an estimate of  $4 * 75 = 300$  per shot. Then I'd need to see how much of the carousel this image really is. If it's one-tenth of the carousel, then I would multiply 300 by 10 to get about 3,000 fish in the carousel.*

2. **How fast are they swimming?** Assuming the carousel is about 30 feet in diameter, one sardine will swim about 100 feet every time it completes one trip around. Choose a fish, use a timer and don't take your eyes off it until it completes a full circle.

How many seconds did it take for one trip? \_\_\_\_\_ seconds

Divide 100 feet by these seconds to get your speed in feet per second:

*Example: If my sardine took 50 seconds to swim 100 feet, then it's moving at  $100 / 50 = 2$  feet per second.*

*Advanced tip: Multiply by 0.682 to convert from "feet per second" to "miles per hour" (Example =  $2 \text{ fps} * 0.682 = 1.36 \text{ mph}$ )*

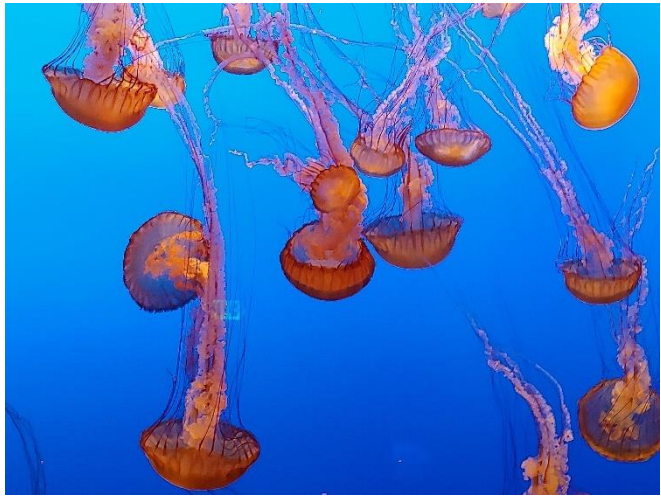
Original file:

<https://www.SuperchargedScience.com/MBAQ>

## Jellyfish (Open Sea)

Jellyfish, Jellies, Sea Nettles – these are stinging, tentacled creatures that increase in numbers in the summer months. There are over 200 different species, and each one has a preferred natural environment.

Jellyfish don't have a brain, blood or hearts but they do have the ability to sense light with their nervous system and coordinate their swimming efforts to help themselves in good places for food, both macro and microscopic. (And no, humans are not on their menu.)



Jellyfish are about 95% water, and they really make the most with the equipment they carry onboard. The simple digestive cavity acts as both the stomach and intestine. Both food and waste pass through the same opening. Their radial symmetry allows them to detect food and danger from all directions simultaneously. (Can you do that? Probably not...)

Sit (or stand) quietly and watch the beautiful jellyfish for at least five full minutes. Write down things you notice during this quiet observation time. Include a sketch if you'd like:

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## Green Sea Turtle (Open Sea)

The Green Sea Turtle is the largest hard-shelled sea turtle. They have a tiny head with two large scales between their eyes. They typically live at least 70 years.

The “green” in their name is from the color of their fat layer, which is green due to the unusual herbivore preference they have for seagrass and algae (all other turtles are omnivorous: eating plants *and* animals).

Typically, Green Sea Turtles grow to 3 – 4 feet long (about a meter) and weigh up to 350 pounds (160 kg). Since they are reptiles, they must surface to breathe. When nesting, females lay about 110 eggs per nest every two weeks on land during her season.



You’ll find these turtles living and nesting in over 140 countries around the world. A group of scientists put a tracker on a green sea turtle named *Emerald*. [Click here to view her current location](#) or scan the special QR code (right) →

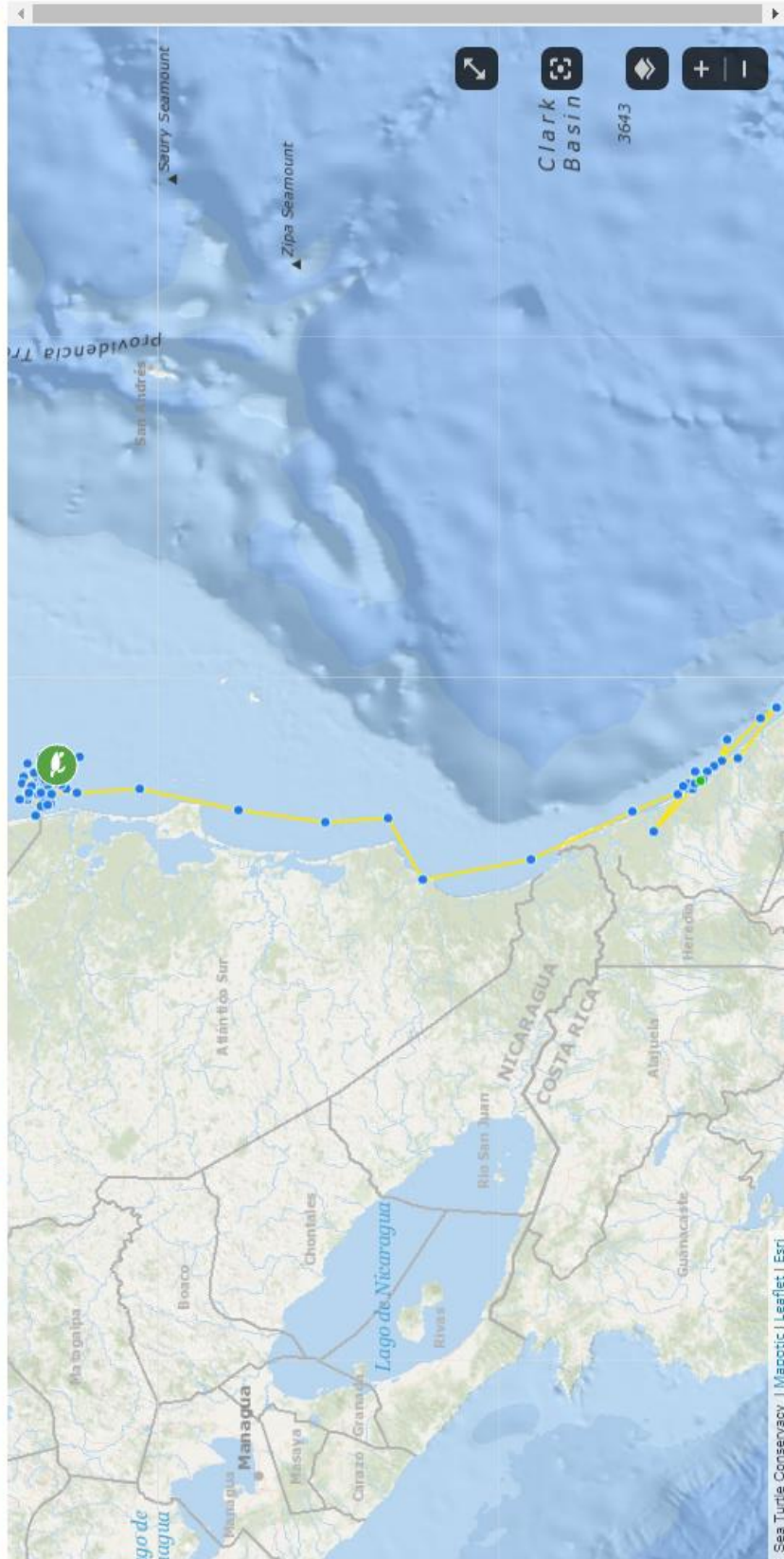
Where is *Emerald* now?

How far has *Emerald* traveled since being tracked?

(HINT: If she’s no longer being tracked, go here for a [current list of turtles](#) that are actively being tracked and pick one that you are interested in. If you still want to use *Emerald*, please refer to the information included on the following page. This information was recorded on Jan 2, 2023. Turtles are typically tracked for just one year.)



Sea Turtle Satellite Tracking | Emerald



**Emerald**

An adult female green sea turtle released with a satellite transmitter on September 20, 2022 from Tortuguero National Park in Costa Rica. She measured 105.5 cm curved carapace (shell) length and is part of a project to track green turtles nesting on the beach at the southern end of Tortuguero National Park. [View migration map.](#)

Last location update: 23 hours

Cumulative distance: 1,159 km / 720 miles

## Scalloped Hammerhead Shark (Open Sea)

The Scalloped Hammerhead Shark is the most common of all hammerhead sharks. It's a large shark that swims in areas worldwide. The hammer-shaped head distinguishes it from most other sharks. The shark's eyes and nostrils are at the tips of the extensions. Both Great Hammerhead and Smooth Hammerhead sharks are larger than the Scallop Hammerhead.

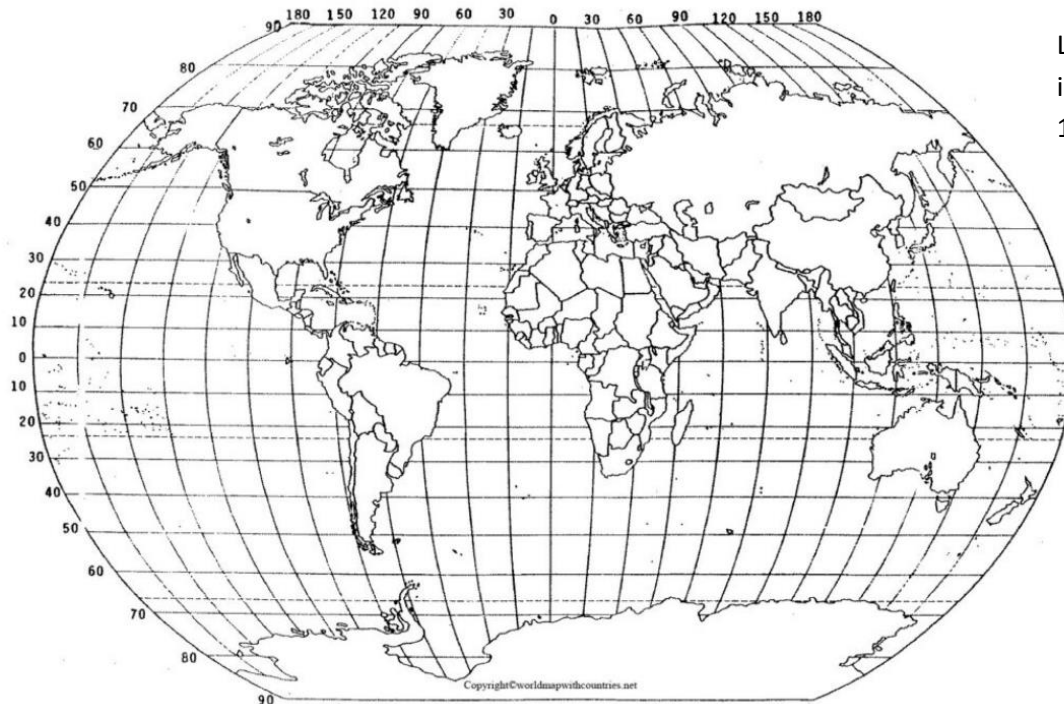


The Scallop Hammerhead prefers to live between latitudes  $46^{\circ}\text{N}$  and  $36^{\circ}\text{S}$  down to a depth of 1,600 feet (500 meters). Typically, males measure 5 – 6 feet (1.5 – 1.8 meters) and weigh 65 pounds (30 kg); the largest ever found was 14 ft (4.3 m) and 336 pounds (152 kg). Hammerheads have a very high metabolic rate, which means they need to take in more food to maintain their weight than other fish of similar size.

Scallop Hammerhead Sharks are often seen in big schools (numbering in the hundreds) because large groups can obtain food easier than solo sharks. Adults tend to hunt deeper, younger sharks stick closer to the surface. Hammerheads are not aggressive toward humans, although accidents do happen when a shark is surprised or frightened.

Scientists have found recently evidence that scalloped hammerhead sharks appear to use the earth's magnetic field to navigate in the ocean. (BONUS IDEA: Can you design a science experiment that would figure out how the shark does this, without harming the shark?)

Using your pencil, color in where you expect to find the Scallop Hammerhead Shark on the map:



Latitudes are in increments of 10 degrees.

## Puffins: Tufted & Black Oystercatcher



The *Black Oystercatcher* is an entirely black bird with a bright yellow iris, a red eye-ring and long (3.5 inches, 9cm) red bill. They are found on the shoreline of western North America from the Aleutian Islands of Alaska to the Coast of Baja California, Mexico. There are approximately 11,000 of these birds in the world today.

*Puffin* can refer to any of the three different species small auks that feed by diving in the water. They are black and white stocky birds with large thick beaks that change color!

The beak becomes brightly colored during breeding season, and afterwards the outer shell of the bill will shed to reveal a duller color.

When airborne, Puffins beat their wings about 400 times per minute. They are very noisy on land but nearly silent at sea. They winter at sea after breeding season. The largest single colony of puffins is found off the South Coast of Iceland in the Westmann Isles, where scientists estimate 1.1 million nests (about 4 million individuals).

Find the map on the previous page and find the spot where you would look to find the Black Oystercatcher (this will be a range, so indicate the area by shading). Also find where the largest puffin colony resides. Label each clearly.

Write down at least three *more* things you learned about either one of these birds (other than the information provided above) by either watching and observing, asking questions from the staff, or by reading the information posted.

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## Spiny Lobster (Rocks & Reefs)

The Spiny Lobsters live in warm seas like the Caribbean and Mediterranean Sea, Australasia and South Africa (where they are called *crayfish* or *crawfish*).

Although they look like true lobsters, spiny lobsters are different as they have long, thick antennae and do not have claws (chelae) on the first four pairs of walking legs.

Spiny lobsters live in cracks and crevices of coral reefs and emerge at night to find dinner. They prefer living together in groups rather than living in isolation.

They navigate using smell and taste by detecting changes in the water. It was only recently discovered that they can navigate using the earth's magnetic field. When threatened, they make a screeching noise by rubbing their spiny antennae against their exoskeleton. They can regenerate claws, legs, and antennae.



Here are the basic parts of a lobster. How many can you identify on the real lobster in the aquarium?

- Abdomen:** the section commonly referred to as the “tail”
- Antennae:** tactile organs, having a sense of touch.
- Antennules:** chemosensors, having a sense of smell, with a function similar to a human nose, located on head, shorter than antennae
- Carapace:** the outer shell of the cephalothorax
- Cephalothorax:** contains the head and thorax (mid-section), together they are commonly called the “body”
- Chelipod (crusher claw):** the larger of the claws, with a rounded surface suitable for crushing prey such as shellfish
- Chelipod (ripper or pincher claw):** the smaller of the claws, which is more pointed and sharp, is used for tearing food apart.
- Eye:** compound eyes each have 10,000 square-shaped tubes packed together to provide a sense of sight
- Mandible:** jaw-like structure for crushing and ingesting food
- Maxillipeds:** the mouth parts of the lobster, flat platelike parts used to pass food to the mandible
- Pereiopods (walking legs):** The two sets of walking legs immediately behind the claws are also used for catching and eating food and have many “taste” sensors; the last two sets of legs are used primarily for walking
- Pleopods:** commonly known as “swimmerets” with tiny hairs. In females the hairs are somewhat longer and are the attachment point for eggs.
- Telson:** the central tail fin
- Uropods:** the outer pairs of tail fins

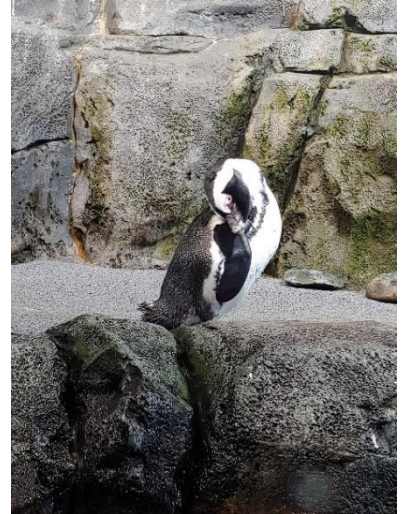
## African Penguins



The African Penguin is a flightless seabird with a streamlined body and stiff wings that live in 24 specific islands in Southern African waters. Adults weigh (5-8 pounds (2.5 - 3.5 kg) and stand 24-28 inches (60-70 cm) tall. They live 10-25 years in the wild, 30 years in captivity. This species has pink patches of skin above the eyes and a black facial mask.

(The patches get pinker when the sweat glands cool the birds' blood when the temperature rises.)

Each penguin has a black stripe and black spots on their chest in a pattern that is unique to each penguin, just like your own fingerprint. The white undersides of the penguin make them are hard to spot by predators swimming under them in the water, and the black on their backs blend with the water when viewed from above.



Wild African Penguins numbered over 4 million about 100 years ago, however today there are less than 50,000. Wild African Penguins are expected to be extinct by 2026 due to oil spills, plastic ingestion and entanglement, habitat destruction (livestock damaging vegetation cover for penguin chicks), invasive species (from unwanted pests like rats to pets like cats and dogs that accompanied humans into penguin territory), and resource competition such as commercial fishing of sardines and anchovies (two of the main prey of these penguins).

*Write down at least FIVE things you could do today to help these wild penguins from becoming extinct!*

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**Thank you to the Monterey Bay Aquarium for being the best aquarium in the world.**

*The mission of the Monterey Bay Aquarium is to inspire conservation of the ocean.*

From sea otters to seaweeds, our unique oceanfront location and timeless galleries bring the wonders of the ocean to life for our visitors. But beyond our exhibits, we are transforming what it means to be an aquarium.

Frolicking sea otters, fast-swimming sharks, pulsating jellies and waddling penguins — our world-class exhibits and breathtaking scenery instill a love of the ocean in our visitors. With over 200 exhibits and 80,000 plants and animals, the Aquarium is a window to the wonders of the ocean.



Our exhibits are just one part of what we do. Our scientists are rebuilding sea otter populations, transforming fisheries and aquaculture around the world, and working to protect California's ocean. Our policy experts are moving the needle on legislation to address climate change and end plastic pollution. Our Seafood Watch team is shifting the global marketplace to make seafood more sustainable.



Education is a top priority. Since 1984, more than 2.5 million students have visited the Aquarium for free. Our life-changing teacher and youth development programs are helping young people find their voices as ocean conservation leaders and will ensure a healthy future for the ocean.

Together we inspire people — from the public to politicians — to take action on some of the biggest threats to ocean health.





## FREE Homeschool Science Class: Marine Biology, Oceanography and Underwater Robots

*Relax while your kids have fun learning science and I do all the teaching for you!*

If you love whales, aquariums, and underwater volcanoes, and you also love to watch everything that swims, crawls, or moves in the sea, then this is the area of science for you.

This free online class is not only going to teach your kids about underwater life and the physical ocean elements, but also provide your kids with a hands-on experience of what it's really like to be a marine biologist.

Kids learn how to study the creatures that live in the sea in their natural environment by building scientific instruments that marine biologists use in the field, including a live-cell microscope and underwater ROV robot in addition to exploring erupting chemical volcanoes, and so much more!



Marine Biology, Oceanography, and Underwater Robots

This class is ideal for kids ages 7-14 (older if they have not studied Marine Biology before). Use the link below to register, and I'll send you all the details. This class is **absolutely FREE** and I'm going to teach your kids real science while having a **blast!**

[www.superchargedscience.com/ocean](http://www.superchargedscience.com/ocean)



**SUPERCHARGED**  
SCIENCE