

Name: _____



MAUI OCEAN CENTER
THE HAWAIIAN AQUARIUM



Maui Ocean Center Learning Worksheets

Fifth Grade



Our mission is to foster understanding,
wonder and respect Hawai'i's for marine life.

Based on benchmarks SC.5.5.1, SC. 5.3.1

CREATE A FOOD CHAIN



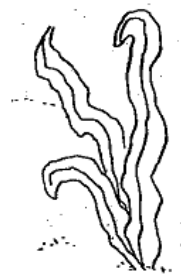
Create two different marine food chains. Be sure to begin each food chain with a Producer (plant) and end each food chain with a Decomposer (such as shrimp, crabs, or marine bacteria). Each food chain should have at least four steps.

Label the Producers (P), Consumers (C), and Decomposers (D) in each of your food chains.

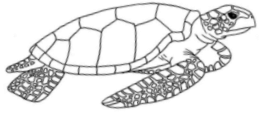
Why do all food chains or food webs begin with a plant?

Explain the role of Consumers in a food chain or food web.

Describe why Decomposers are so important in a food chain or food web.

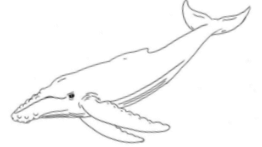


INHERITED TRAITS VS. LEARNED BEHAVIOR

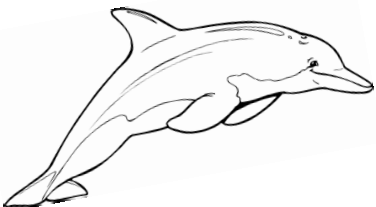


Some behaviors and physical traits of living organisms are determined by genetics and are inherited (e.g. eye color), while others are learned behaviors, (e.g. communication, riding a bike). Below is a list of traits or behaviors of some

marine animals. Mark whether these traits are learned or inherited by checking the corresponding box. Keep in mind that for most fish, there is little to no interaction between the young and their parents; however, in marine mammals (such as dolphins and whales) the young stay with their mothers for years.



Traits	Inherited/ instinctual	Learned behavior
Migration habits for Sea Turtles		
Migration in Humpback Whales		
The color of a fish		
Shark hunting techniques		
Learning to swim in Monk Seals pups		
Spawning in Coral		
Communication in Dolphins		
Knowing which foods to eat		
Dolphin hunting techniques		

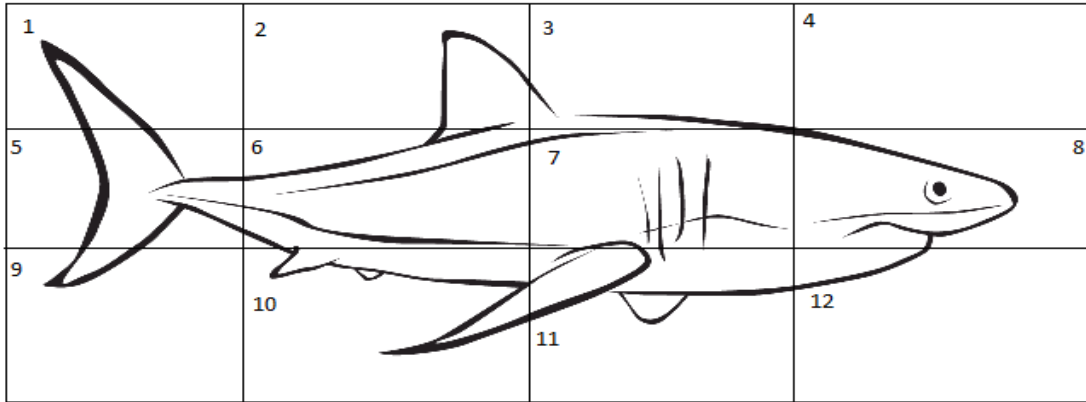


Look at your chart. What can you conclude about the differences between fish and marine mammals with regard to their brains?



ANATOMY OF A SHARK

Visit our Open Ocean exhibit and observe the species of sharks that live there. Now draw a shark in the empty squares below. Each square is numbered. Use the numbered chart immediately below as a guide to help you complete your drawing.



On your new drawing, label the sharks: pectoral fins, caudal fin, dorsal fin, gills, mouth, and eyes.

1	2	3	4
5	6	7	8
9	10	11	12



Sharks are ancient animals that have been on Earth for a long time and still serve a very useful purpose. They eat sick and injured animals. Name one species of shark you observed in the Open Ocean exhibit.

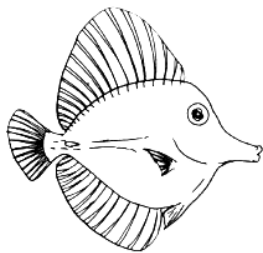
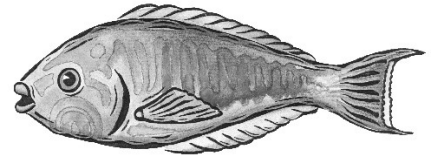


THE IMPORTANCE OF SHAPE...

Fish come in many different shapes, sizes and colors. For part of this worksheet you will be asked to observe and make predictions about fish based on their shapes. Here is some helpful information about common fish shapes:

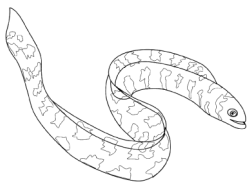
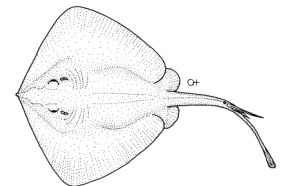
Body Forms-directly related to the lifestyle of the fish

- (1) **Streamlined (or Fusiform):** Shape helps to lower frictional resistance, they are fast swimmers and can swim for long distances. Usually found in the open ocean. **Example:** Jacks (ulua), barracuda and wrasse.



- (2) **Laterally compressed:** Tall, thin shape helps to enter vertical crevices, also good for leisurely swimming, but still efficient enough to allow for bursts of speed. Allows for quick sharp turns - very maneuverable. When viewed head on, they seem to disappear. **Example:** Yellow tangs, Angel fish, and Unicorn fish

- (3) **Broad and flat (Dorsoventrally-Compressed):** Bottom dwellers, adapted to lying on or below surface of sand. **Example:** stingrays and flounders



- (4) **Elongated (eel-like):** Able to move in crevasses, often live in narrow spaces in rocks or coral reefs. **Example:** eels and Pipefish

- (5) **Sphere:** Rounded, globe-like; slow-swimmers; may use lights or lures to attract prey items to them. **Example:** Puffer fish, Porcupine fish, Frog fish



STAYING HYDRATED IN SALTWATER!

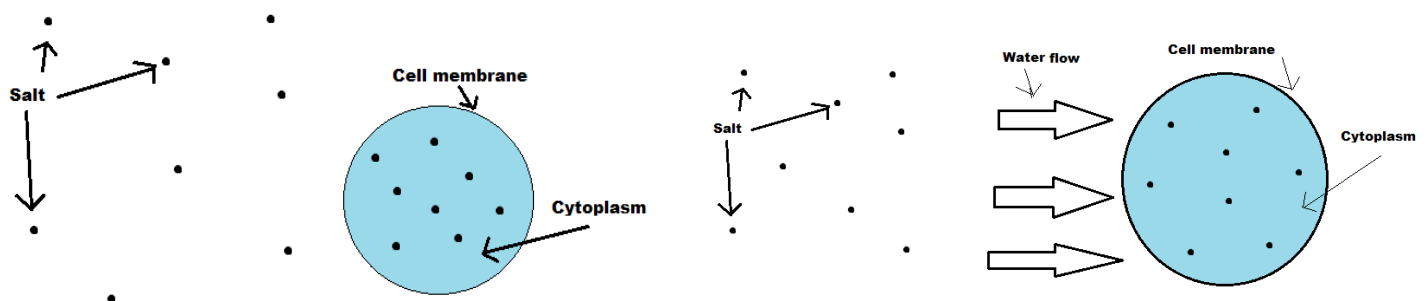
There are two types of fish: freshwater and saltwater fish. Generally, saltwater fish cannot live in freshwater and freshwater fish cannot live in saltwater. How is it that saltwater fish are able to survive in an environment with such a high concentration of salt? The key factor behind this is a process called osmosis. To explain osmosis, we will take a look at the cells, the building block of all living things.

There are two main parts of the cell on which we will focus; the cell membrane and the cytoplasm. Think of the cell membrane as a “skin” that surrounds the cell and the cytoplasm as the gel-like substance that fills the cell and surrounds its contents. The job of the cell membrane is to keep everything inside safe, and to keep a balance between the levels of chemicals (mostly salts) in the cell and in the surrounding environment. Cells work to keep the levels (or concentrations) of chemicals on the inside the same as those on the outside. This is accomplished because the cell membrane allows water to pass in and out of the cell.

What does this all mean?...

If a cell that was previously surrounded by freshwater is suddenly exposed to saltwater, the cell membrane will allow most of the water inside the cell to leave. This makes the cell shrink, and increases the concentration of salt in the cytoplasm so that the concentration inside the cell becomes equal to the concentration outside the cell again. So the cell membrane lets water move through it from areas of low concentration (less salt, more water) to areas of high concentration (more salt, less water). The process is called osmosis. This helps to keep the concentration of chemicals the same inside and outside of the cell.

In the example below, you can see how the water moves into the cell from an area of low concentration to an area of high concentration. The cell gets larger because it filled with water.



Just like humans, fish need salt in their bodies to keep them alive, but too much or too little is not a good thing. Fish found in saltwater use their kidneys to filter out the extra salt and get rid of it through waste, just like in people. By getting rid of all that extra salt water they are able to maintain a healthy level of salt in their body and stay hydrated.



SALTWATER FISH VS. FRESHWATER FISH

Using what you have learned about osmosis, predict what would happen to the cell of a saltwater fish if it swam into freshwater (where the salt concentration is extremely low) and what would happen to the cell of a freshwater fish if it swam into saltwater (where the salt concentration is extremely high).

Saltwater fish in freshwater:

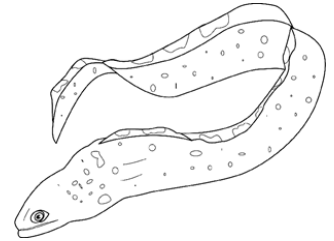
Freshwater fish in saltwater:



CORAL REEF DWELLERS

Find two animals that live in different sections of the reef. Draw these animals and write where on the coral reef you found them (shallow, mid, deep). Explain why you are likely to see them in these different parts of the reef.

Animal #1



Animal #2



OCEAN DRIFTERS



Plankton are animals that drift with the ocean currents. Watch the plankton video in the Open Ocean building and answer the following questions.

1. How big are most of the plankton shown on the video?

- Less than 1 inch
- 2-5 inches
- 6-12 inches

2. Draw a jellyfish and label the tentacles.

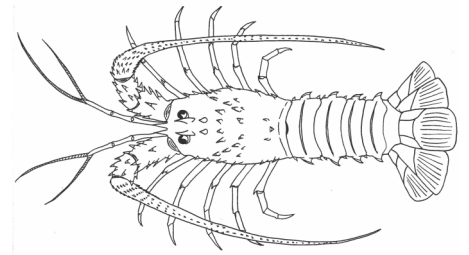
3. Are jellyfish a type of plankton? Why?

4. A mutualistic relationship is when two animals are beneficial to one another. The upside jellyfish displays a unique relationship with a type of plant. Describe this symbiotic relationship and the type of plant it benefits from. How did this sea jelly get its name?



SCAVENGER HUNT

Can you find all of the different animals listed in the chart below? Challenge yourself to find each one and answer the questions .



Animal Name	Name a unique characteristic (color, shape, abilities, where it lives)	What kind of an animal is it? (fish, crustacean, mollusk)
Convict tang		
Knobby sea star		
Tiger cowry		
Cardinal fish		
Whitemouth moray		
Milletseed butterflyfish		
Banded coral shrimp		
Green sea turtle		
Scalloped hammerhead		
Moon jellyfish		
Mushroom coral		
Hawaiian Squirrelfish		

