Name: _____

MAUI OCEAN CENTER

THE HAWAIIAN AQUARIUM

Maui Ocean Center Learning Worksheet

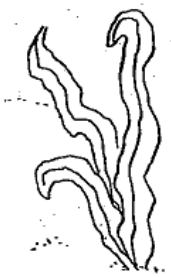
Sixth Grade

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

Based on benchmarks SC.5.5.1, SC. 5.3.1, SC. 6.2.1, SC. 6.3.1

CREATE A FOOD CHAIN

Create a marine food chain. 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 your food chain.

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

_____

_____

What is the role of Consumers in a food chain or food web?

_____

_____

Why are Decomposers so important in a food chain or food web?

_____

_____

SYMBIOTIC RELATIONSHIPS & ENERGY TRANSFER

Coral reefs play an important role in Hawaii's marine ecosystem. A diverse number of organisms rely on coral reefs for food as well as shelter. Symbiotic relationships are observed in many marine organisms. Figure 2. illustrates the relationship between coral organisms and zooxanthellae algae. Explore our Living Reef building and answer the following questions about energy transfer between these two organisms.

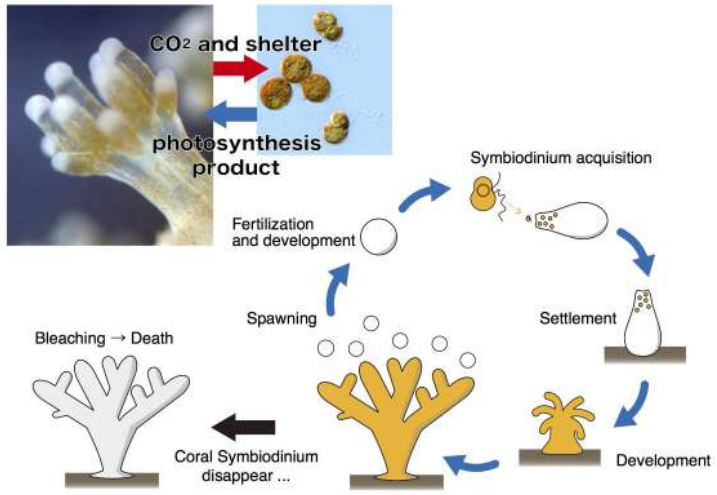


Figure 2. A symbiotic relationship between corals and Symbiodinium

1. Describe how each organism benefits from this symbiotic relationship between coral and the algae?

_____

_____

_____.

2. What source of energy does the symbiotic algae use to produce the food and oxygen for the polyp?

_____.

3. Roughly what % of food does the zooxanthellae provide to coral? _____.

4. Coral secretes a hard skeleton made out of limestone or calcium carbonate. What contributes to the formation of this structure?

_____

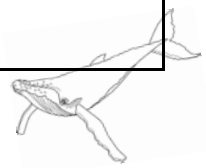
_____

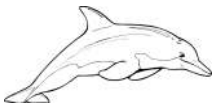
_____.

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 correct 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		





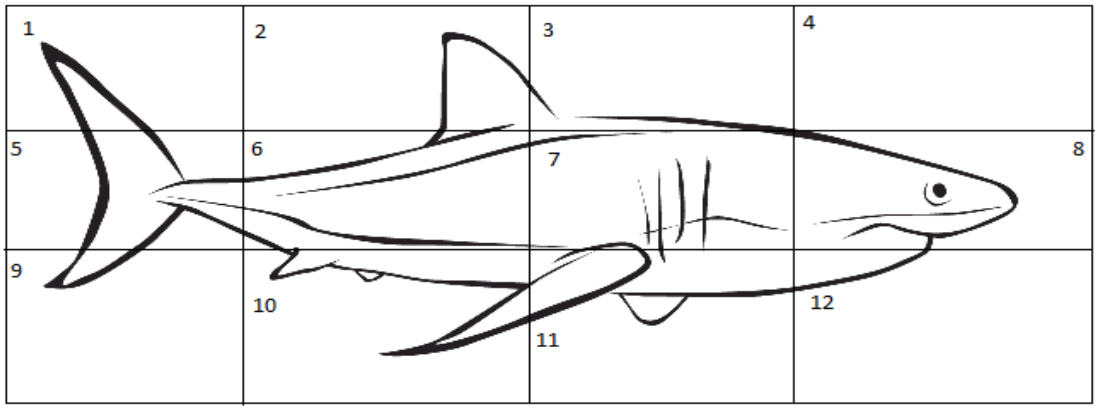
Look at your chart. What can you conclude about the differences between fish and marine mammals regarding their brains?

_____

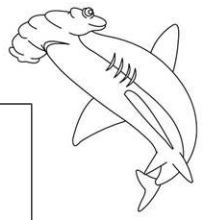
_____.

ANATOMY OF A SHARK

Visit our Open Ocean exhibit and observe some of the species of sharks swimming by. Now draw a shark! Each square is numbered. If you copy the section of shark in each square, your drawing should look like the picture.



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. Describe the importance and role of sharks in our marine ecosystems?

_____

_____

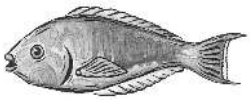
_____.

FISH AND THEIR SHAPES!

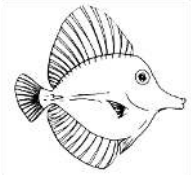
Fish come in many different shapes, sizes and colors. For part of this worksheet you will be asked to observe and make predictions about fish based on their shapes. Here is some helpful information about common fish shapes:

Body Forms-directly related to the lifestyle of the fish

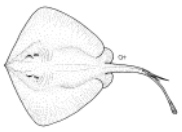
(1) **Streamlined (or Fusiform):** Helps to lower frictional resistance, fast swimmers and can swim for long distances. Usually found in the open ocean. **Example:** Jacks (Ulua), Barracuda, and Wrasse.



(2) **Laterally compressed:** Tall, thin shape helps to enter vertical crevices, also good for leisurely swimming, but still efficient enough to allow for burst speed. Allows for quick harp turns and very maneuverable; when viewed from head on, they seem to disappear. **Example:** Yellow Tangs, Angel fish, and Unicorn fish

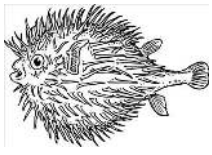


(3) **Broad and flat** (Dorsoventrally-Compressed): Bottom dwellers, adapted to lying on or below surface of sand. **Example**: Stingrays and Flounders



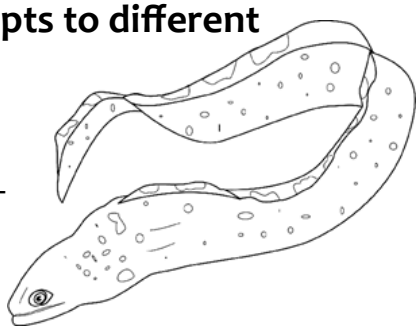
(4) **Elongated** (eel-like): able to move in crevasses, often live in narrow spaces in rocks or coral reefs. **Example:** Eels and Pipefish

(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



CORAL REEF DWELLERS

Find two animals who live in different sections of the reef. Draw these animals, write where on the coral reef you found them (shallow, mid, deep) and explain why you are likely to see them in these different parts of the coral. Apply what you have learned about fish shapes and how each animal adapts to different environments.



Animal #1: _____

Animal #2: _____

Marine animals live in different places, some prefer the surge zone with lots of waves, others the calmer deep .

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.

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

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

Draw a sea jelly and label the tentacles

Are sea jellies a type of plankton? Why?

_____

A mutualistic relationship is when two animals benefit and help each other survive. The upside jellyfish displays a unique relationship with a species of algae. Describe the relationship and explain the orientation of this species of jellyfish.

_____
_____
_____
_____

TECHNOLOGY AND SCIENCE

The Makali'i in the Open Ocean exhibit was Hawaii's first research submersible used to explore the deep sea around the Hawaiian Islands. New technology today has drastically influenced ocean exploration. Give three examples of newer technology (within the last 50 years) and describe how it has helped us in science and impacted or assisted our society. Provide examples that are relevant to the ocean.

Example #1

_____

_____

_____

Example #2

_____

_____

_____

Example #3

_____

_____

_____