Name: _____

MAUI OCEAN CENTER

THE HAWAIIAN AQUARIUM

Maui Ocean Center Learning Worksheet

Eight Grade

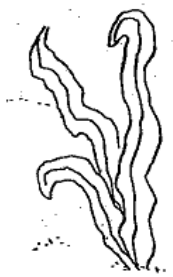
Our mission is to foster understanding,
wonder and respect for Hawai'i's Marine Life.

Based on benchmarks SC. 7.3.1, SC. 8.2.1, SC. 8.5.1, SC 8.8.7

CREATE A FOOD WEB

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

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



Why do all food webs begin with a plant?

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What is the role of Consumers in a food web?

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Why are Decomposers so important in a food web?

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How does energy move through food webs?

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INTERDEPENDENCE

We just examined food chains and how animals depend on each other to gain nutrients and energy. Keep in mind how animals interact with and depend on other organisms for their own survival.

Visit our Open Ocean Exhibit and observe some of the apex predators, like the sharks. Explain the importance of a predator in a biological community.

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Give an example of two animals you observed at Maui Ocean Center that benefit from one another. What were they doing to help each other survive?

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Describe a parasitic relationship and what makes it harmful to the host.

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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.

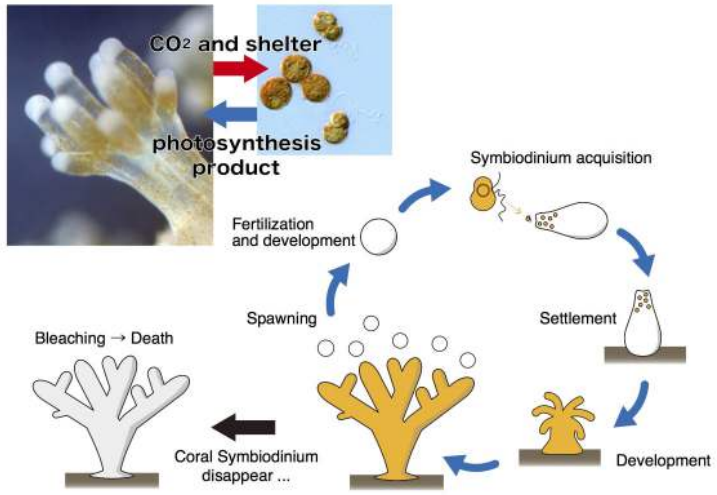

Figure 2. A symbiotic relationship between corals and Symbiodinium

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

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

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

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

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CORAL REEF DWELLERS

Find two animals living in different sections of The Living Reef - Surge Zone and Deep Reef. Draw these animals and write where you're likely to see them and why.

Animal 1

Animal 2

Marine animals live in different places, some prefer the surge zone with lots of waves, other the deep reef with very few waves.

PHYSICAL CHARACTERISTICS OF THE OCEAN!

When describing the physical characteristics of an object or substance you generally focus on features that are measurable. For example area, mass, volume, density, color, shape and state of matter. The ocean is made up of many physical characteristics including temperature, turbulence, light and salinity (amount of salt). The physical characteristics vary depending on geographic location. Answer the following questions regarding physical characteristics of the ocean.

Temperature

Temperature is a very important characteristic of the ocean. List some of the ways in which ocean temperatures effect the density of the ocean and the life forms which live in it.

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Salinity

Salt is by far the most common mineral found dissolved in sea water. There are two important factors that affect salinity in our oceans. List at least two factors that impact salinity levels in our oceans. *Hint: Think of the water cycle.

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PHYSICAL CHARACTERISTICS OF THE OCEAN!

A drastic change in physical characteristics in the ocean can potentially alter or change an ecosystem. Think about what you have learned about coral reefs and the important relationship coral colonies have with zooxanthellae. Sediment and pollutants are often introduced into the marine environment from terrestrial sources. What physical characteristics are being altered when sediment and pollutants are introduced?

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Name ways in which this affects the survival of coral and other organisms that rely on that ecosystem?

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Humpback Whale migrate to the Hawaiian Islands to breed and raise their young during the winter months but journey back to Alaskan waters to feed in the summer. What differences in physical characteristics between North Pacific and South Pacific ocean regions contributes to the whale's migration and feeding behaviors?

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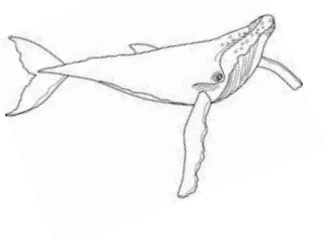

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ANCIENT HAWAIIANS & AHUPUA'A SYSTEM

Explore our Hawaiians and the Sea area and learn about the relationship between human cultures, science and even how they applied their use of technology to build successful systems, such as the ahupua'a system.

Describe what an Ahupua'a system was and how it was managed.

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Why is the Ahupua'a such a well-developed system and what was achieved by the ancient Hawaiians by implementing it?

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The ancient Hawaiians were very resourceful and developed many tools used for hunting within their land and sea divisions. Describe the he'e lure.

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To this day, ancient Hawaiians are referred to masters of aquaculture. They developed a unique system for stocking and harvesting fish in ponds called Loko I'a or fishponds. Describe how shoreline fish ponds were constructed. Describe why these ponds were so successful.

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SOCIETY, SCIENCE & TECHNOLOGY TODAY

Only a small fraction of our oceans have been explored as we continue to explore them. Advancements in technology has broaden our understanding and enabled us to discover regions of the ocean never seen before. Visit the Makali'i submersible located in the Open Ocean exhibit area. What kind of research has been done using the Makali'i submersible?

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Do some research on your own!

As our human population continues to grow, the need for regular food sources demonstrates the challenge of maintaining sustainable fisheries through limiting by-catch and using environmentally friendly fishing equipment and devices. Do some research on your own to determine why some fisheries are sustainable and how technology is making it possible. **Hint:** A good place to start is by looking at our Seafood Watch Cards located at the end of our Open Ocean exhibit.

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