

## Ocean Ecosystem Descriptions

Read the passage about your assigned ocean ecosystem. Look at the illustration of your assigned ecosystem and label all of the abiotic factors you see. Then list other abiotic factors that are not seen in the illustration. Use your ecosystem descriptions and illustrations to complete the Ocean Abiotic Factors Chart.

- **Coral Reefs** primarily occur throughout the warm tropical and subtropical regions of the ocean. These areas are at latitudes between the Tropic of Capricorn and Tropic of Cancer. Some corals can live in colder, deeper waters. Corals can be classified as hard (stony), flexible or soft, and are made up of tiny animals, called polyps. Some corals contain a single polyp but most are colonial. Colonial corals contain thousands of polyps. Examples of flexible corals include the sea fans, sea whips, and sea plumes. True soft corals include black, mushroom, and tree corals. Stony, or reef-building, corals produce calcium carbonate skeletons and are responsible for creating the structure of the reef. Common types of stony corals include brain corals, pillar corals, plate corals, and branching corals like elkhorn and staghorn. Reef-building coral polyps divide as they grow, forming layer upon layer. Symbiotic algae (zooxanthellae) live within the tissues of reef-building corals. Some coral reefs are thousands of years old. Coral reefs are one of the most biologically diverse ecosystems in the world and are home to everything from sponges and jellies to octopus, manta rays, and sharks. They also provide spawning, nursery, refuge, and feeding areas for many marine organisms. The world's reefs contain over 4,000 different fish species and hundreds of coral species. Corals are fragile systems and their health or growth can be impacted by several factors. These factors include increased temperatures and nutrient runoff, decreased water clarity, and wave action from storms.
- **Open Ocean** is the largest marine ecosystem. It contains approximately 65 percent of the volume of the world ocean. It extends from the edge of the continental shelf outward and encompasses the entire water column. The open ocean zone generally refers to the upper 200 meters (656 feet) of water. This distinguishes it from the deep sea ecosystem below. It is a highly diverse and dynamic ecosystem that contains a wide variety of life. The diversity of open ocean organisms ranges from megafauna, or large animals like sharks, whales, dolphin, and sea turtles, to microscopic plankton and small schooling fish. Sea birds and large migratory fish also play an important part in this ecosystem. Although the megafauna are large and seem to dominate, invertebrate species actually make up over 95 percent of the animal species found in the open ocean. Large populations of plankton drift along on ocean currents and form the base of the open ocean food web. Open ocean currents carry nutrients to different parts of the ocean. Currents also help some animals migrate and allow

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others to distribute their eggs throughout the ocean. Even though the abiotic conditions like light, temperature, salinity, circulation of the open ocean are fairly consistent, there are areas where life is both abundant and sparse.

- **Rocky Shore** ecosystems are coastal areas with solid rock substrate or foundation. Strong tidal influences create distinct tidal zones. Changing tides cause rocky shore areas to be completely covered with water at certain times of the day. At other times, these same areas can be completely exposed to the air (aerial exposure) and sunlight. These abiotic factors make the rocky shore one of the most physically stressful marine ecosystems. Organisms that live along the rocky shore must be able to tolerate extreme changes in temperature, salinity, moisture, and wave action. Sometimes these changes occur more than two times a day. Tidepools and rocky shores are highly complex and biologically diverse. Numerous marine invertebrates like urchins, crabs, mussels, barnacles, anemones, sea stars, and sea hares are well-adapted to the extreme conditions of the rocky shore ecosystem. Organisms of the rocky shore face some other threats. They must also protect themselves from terrestrial species like humans, birds, cats, rodents, that have access to the rocky shore.

Name \_\_\_\_\_ Date \_\_\_\_\_

## Ocean Abiotic Factors Chart

Use your assigned marine ecosystem description and illustration to decide which abiotic factors are impacting the organisms in your ecosystem. Place check marks next to those factors in the chart below. Then write one or more examples of how that factor is impacting organisms in the ecosystem.

	Rocky Shore		Coral Reef		Open Ocean	
	Abiotic Factor	Examples	Abiotic Factor	Examples	Abiotic Factor	Examples
Temperature						
Salinity						
Nutrients						
Oxygen						
Solar energy						
Water clarity						
Tides						
Waves						
Substrate						
Aerial exposure						
Currents						