

Name _____

Date _____

The Bottom of the Food Chain

The ocean covers 71% of the earth's surface. With the vast biodiversity on land it's easy to assume that there are a multitude of marine organisms. In fact, new marine species are constantly being discovered as researchers use submersibles to explore the depths of the ocean. Just like on land, there are numerous different habitats in the ocean and marine creatures have adapted to fill the niches.

The smallest marine creatures are bacteria and, like on land, bacteria are everywhere in the ocean. Marine biologists estimate that there are 100 million bacteria in every gallon of seawater. Bacteria are also responsible for keeping the ocean clean by breaking down organic matter. Anaerobic bacteria break down oxygen containing compounds and release oxygen into the ocean.

Benthic Animals and Plants

Marine biologists estimate that there are 150,000 species of benthic animals in the ocean. Benthic animals live in or on the seafloor. Animals that live *in* the rocks and sediment at the bottom of the ocean, like worms, are called infauna while animals that live on the surface of the ocean floor are called epifauna. These creatures are all invertebrates; they do not have a backbone. Instead, many benthic animals, like crabs, starfish and snails, have a hard outer shell.

Some species of benthic animals are scavengers that clean the ocean floor. The remains of dead plants and animals sink to the ocean floor; benthic animals that eat these remains by ingesting sediment are called deposit feeders. Benthic animals that eat only decomposed plant material are called detritus feeders while filter feeders such as clams and scallops have sieves that filter food directly from the water.

There are benthic plants as well. Sea grasses are an example of benthic plants. They grow on the ocean floor in shallow water where they can get light for photosynthesis and provide a habitat for fish. Sea grasses are plants while seaweeds like kelp are not plants but are multi-celled algae. Seaweed attaches to the ocean floor and also provides an important habitat for fish and other marine creatures.

Plankton

Plankton is a critical food source for other marine creatures. Even though these microscopic plants and animals are composed of one or a just a few cells, they are the food source for some species of the largest marine mammals, whales. Most plankton float in the water without a means of locomotion but some have a limited locomotion capability. Marine animals that are filter feeders ingest plankton by sieving the water. Plant plankton or algae are called phytoplankton while tiny animal plankton is called zooplankton. Phytoplankton use photosynthesis to create nutrients and oxygen that enter the ocean water. Phytoplankton lives near the surface of the water where they can get sunlight needed for photosynthesis.

Diatoms are algae that form a major subgroup of single-celled phytoplankton. There are an estimated 100,000 species of diatoms. They are characterized by an outer wall made from silica. Examples of diatoms are golden algae, kelp and water molds. Diatoms exhibit a variety of intriguing shapes when magnified. Diatoms are a major food source for mollusks like clams and oysters.

Zooplankton that feed on phytoplankton are called primary consumers while zooplankton that feed on other species of zooplankton are called secondary consumers. The larval stages of some marine organisms are considered to be zooplankton due to their size. These larvae are an important part of the marine food chain because larger animals rely on all kinds of zooplankton as a food source. Environmentalists and marine biologists measure the amount of plankton in the water to assess how healthy an area of the ocean is.

Krill

Krill are a shrimp-like form of zooplankton that are an important food source for fish, sea birds and mammals, including seals and whales. Krill are crustaceans, that is, they have an exoskeleton or an outer shell. Krill occur in the ocean worldwide with many known species and most species grow to a length of about a half-inch. Krill occupy a spot near the bottom of the food chain because they feed on phytoplankton. Biomass is defined as the weight per unit of area of living organisms. Krill have the greatest biomass of all multicellular creatures on earth, estimated to be twice that of all humans.

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Circle True or False after analyzing each of the following statements.

1. True False The smallest marine creatures are phytoplankton and zooplankton.
2. True False Benthic animals are creatures that live in or on the seafloor.
3. True False Aerobic bacteria break down oxygen containing compounds and release oxygen into the ocean.
4. True False Benthic animals that eat only decomposed plant material are called detritus feeders.
5. True False Ocean creatures like crabs, starfish and snails are invertebrates.
6. True False Seaweed species are examples of benthic plants.
7. True False Phytoplankton use photosynthesis to create nutrients and oxygen that enter the ocean water.
8. True False Diatoms are a type of algae that are characterized by an outer wall made from silica.
9. True False Environmentalists and marine biologists measure the amount of seaweed in the water to assess how healthy an area of the ocean is.
10. True False Krill are a shrimp-like form of phytoplankton that are an important food source for fish, sea birds and mammals, including seals and whales.

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Answers

1. False
2. True
3. False
4. True
5. True
6. False
7. True
8. True
9. False
10. False