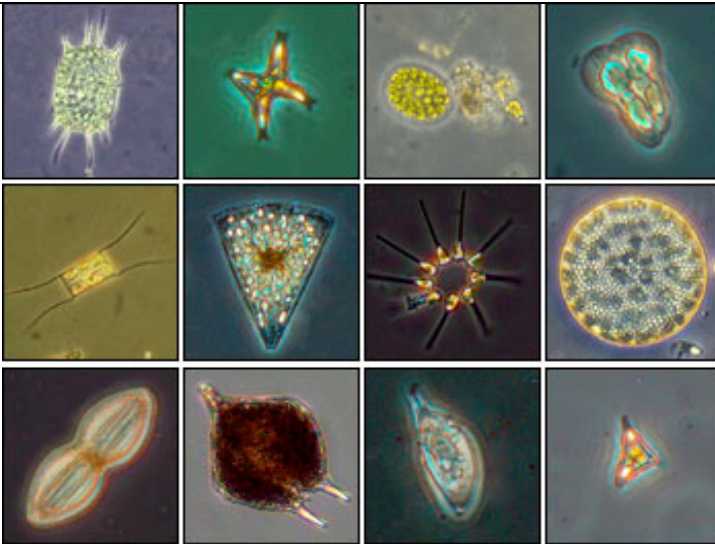




Mytilus californianus - this mussel is a filter feeder, feeding on plankton. They are the main source of food for both the Ochre Sea Star (*Pisaster Ochracus*) and the rock whelk (*Nucella emarginata*). They attach themselves to rock substrates with adhesive bistle fibers that are strong enough to endure the pounding force of countless waves. Due to their ability to secure themselves to rocky substrates and each other, these mussels are an important species in the tide pools, providing habitat for marine snails, algae, barnacles, limpets, and others.



Phytoplankton – these tiny algae, are a group of diverse photosynthetic protists (autotrophs) that create their own food using the energy from the sun to synthesize carbohydrates. “Phyto” means plant-like and “plankton” refers to an organism that floats freely in the water, not controlling its movement. They are the main producers in the tide pool ecosystem and serve as a food source for filter feeders like clams, mussels, barnacles and sponges.



Giant Green Sea Anemone – The green color of this anemone, a heterotroph, results from photosynthesis algae living inside the cells of the tentacles. This symbiotic relationship is an example of mutualism in which both organisms benefit from their close association. In this case, the algae get a constant source of carbon dioxide and protection from the anemone and the anemone gets extra glucose and oxygen that it needs for cellular respiration.



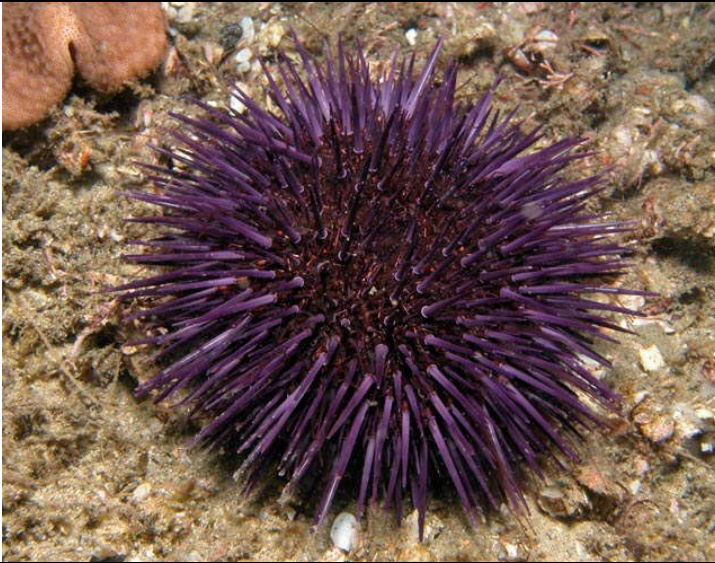
Zooplankton – this diverse group of tiny animals feeds on phytoplankton and spend their lives floating freely in the oceans currents and tides. Many organisms found in tide pools including anemones, sea stars, sea urchins, mussels, and barnacles spend a portion of their life cycle as plankton while they are fertilized eggs or during their early development as larvae.



Shore Crab – These crabs main food is the film of algae and diatoms growing on the rocks in higher pools and crevices, which the crab scrapes off with their claws. Shore crabs also eat dead animals they find. They will sometimes feed on limpets, snails, or other species of crabs making them omnivores that eat both producers and other consumers. In turn, these crabs are eaten by sea gulls or other land animals. Older crabs are sometimes seen encrusted with bryozoans and barnacles, suggesting that they may have ceased to molt and thereby serving as habitat for other species.



Ochre Sea Star - These carnivores are the principle predator of the Pacific Coast intertidal. The preferred food source of the ochre star is the California Mussel (*Mytilus californianus*). It eats by wrapping its arms around the mussel and prying its shell open. Once the shell is slightly opened, it expels its stomach inside the shell and begins digesting its prey. Where mussels cannot be found, the ochre star will feed on barnacles, snails, and small crabs. Because of its predation, the ochre star is considered a keystone species in the regulation of the *M. californianus*. It limits both their size and distribution. If not for its predation, *M. californianus* would quickly take over the lower intertidal zone keeping other sessile organisms from colonizing and inhabiting the area. Its only known predators are sea gulls, which eat very few sea stars, and sea otters. However, otters do not eat the entire sea star. They eat only the tips of the rays leaving it alive and able to regenerate back its arms.



Purple Sea Urchin - Sea urchins play an important ecological role as grazers of marine algae, kelp. When their predators such as sea otters are absent, urchins can become very numerous. When this happens, the seabed is stripped bare of kelp forests creating what is known as urchin barrens. These urchins are nocturnal and do most of their grazing at night. During the day they will usually stay stationary or in hiding spots in rocks.



Kelp – this marine alga and primary producer serves as an important shelter and habitat for many fishes and marine invertebrates. It is also the favorite food of sea urchins.



Rock Whelk – This carnivorous marine snail can be found nestled in the tightly packed mussel beds of the rocky intertidal community. They excrete enzymes that dissolve a way the hard calcium carbonate shell of the mussels and drill a tiny hole with their radula, a raspy tongue like structure. Once the hole is complete, they release digestive enzymes into the mussels shell and vacuum out the mussels soft body parts for a meal. These whelks also serve as food for the king of the intertidal, the sea star.



Gooseneck Barnacle – Barnacles are crustaceans that have jointed legs and shells of connected overlapping plates. Instead of crawling after food, they glue themselves to rocks, ships, pillings, abalones, and maybe even whales and wait for food to wash by. When barnacles are under water or when a wave washes over them, they reach out little feathery legs to strain out plankton and absorb oxygen. The barnacle's enemies are worms, snails, sea stars, fish like sheephead, certain shorebirds, and oil spills. Some are parasites inside crabs or in other animals.



Tide pool sculpin - They eat crabs, shrimp, fish eggs, and small shrimp.
The animal was in the high tide zone and was swimming very fast! Some tidepool sculpins are camouflaged. The one in the picture is the same color as the bottom of the tide pool. They hide under rocks and coralline algae.



Black Turban Snail - This species is an algal grazer, preferring soft algae. It can be very abundant and conspicuous in the mid-intertidal zone. The species is found more abundantly in open rocky areas than in areas heavily covered with algae. Large individuals may be 20-30 years old. They are eaten by sea otters, red rock crab (*Cancer antennarius*), *Pisaster ochraceous*, and some predatory snails. Their empty shells are a favorite of hermit crabs.

