

## **Adaptation**

There are thousands of species of marine life, from tiny zooplankton to enormous whales. Each is adapted to the specific habitat it occupies.

Throughout the oceans, marine organisms must deal with several things that terrestrial life do not:

Regulating salt intake

Obtaining oxygen

Adapting to water pressure

Dealing with wind, waves and changing temperatures

Getting enough light

This article discusses some of the ways marine life survives in this environment that is so different from ours.

## **Salt Regulation:**

Fish can drink salt water, and eliminate the salt through their gills. Seabirds also drink salt water, and the excess salt is eliminated via the nasal, or "salt glands" into the nasal cavity, and then is shaken, or sneezed out by the bird. Whales don't drink salt water, instead getting the water they need from the organisms they eat.

## **Oxygen:**

Fish and other organisms that live underwater can take their oxygen from the water, either through their gills or their skin.

Marine mammals need to come to the water surface to breathe, which is why the deep-diving whales have blowholes on top of their heads, so they can surface to breathe while keeping most of their body underwater.

Whales can stay underwater without breathing for an hour or more because they make very efficient use of their lungs, exchanging up to 90% of their lung volume with each breath, and also store unusually high amounts of oxygen in their blood and muscles when diving.

## **Temperatures:**

Many ocean animals are cold-blooded (ectothermic) and their internal body temperature is the same as their surrounding environment.

Marine mammals, however, have special considerations because they are warm-blooded (endothermic), meaning they need to keep their internal body temperature constant no matter the water temperature.

Marine mammals have an insulating layer of blubber (made up of fat and connective tissue) under their skin. This blubber layer allows them to keep their internal body temperature about the same as ours, even in the cold ocean. The bowhead whale, an arctic species, has a blubber layer that is 2 feet thick (Source: [American Cetacean Society](#).)

## **Water Pressure:**

In the oceans, water pressure increases 15 pounds per square inch for every 33 feet of water. While some ocean animals do not change water depths very often, far-ranging animals such as whales sometimes travel from shallow waters to great depths several times in a single day.

Whales can dive deeply. The sperm whale is thought to be able to dive over 1 ½ miles below the ocean surface, and they can do that successfully because their lungs and rib cages collapse when diving to deep depths.

## **Wind and Waves:**

Animals in the intertidal zone do not have to deal with high water pressure, but need to withstand the high pressure of wind and waves. Many marine invertebrates and plants in this habitat have the ability to cling on to rocks or other substrates so they are not washed away, and have hard shells for protection.

## **Light:**

Organisms that need light, such as tropical coral reefs and their associated algae, are found in shallow, clear waters that can be easily penetrated by sunlight.

Since underwater visibility and light levels can change, whales do not rely on sight to find their food. Instead, they locate prey using echolocation and their hearing.

In the depths of the ocean abyss, some fish have lost their eyes or pigmentation because they are just not necessary. Other organisms are bioluminescent, using light-giving bacteria or their own light-producing organs to attract prey or mates.

