BODACIOUS dream EXPEDITIONS

EXPEDITION EXPLORER GUIDE

THE ABUNDANT VARIETY OF **SEA LIFE**

Life began in the sea, and scientists think it first appeared about 3.8 billion years ago. The first inhabitants were neither plants nor animals. They were mostly likely bacteria that evolved to use the sun's energy or the heat from deep-sea vents to make oxygen.

The Cradle of Life

An abundance of oxygen allowed life to flourish in the oceans. Sponges, jellyfish, worms and starfish were among the earliest creatures to appear. Fish arrived millions of years later. Some of these fish grew lungs as well as legs, gradually evolving into the first amphibians. From amphibians, the lines continue to reptiles, birds and mammals. Today the oceans are home to innumerable living things… from microscopic plants and animals like plankton all the way up to giant whales. It is estimated 80% of the animals on Earth live in the water.

The Chain of Life

In the upper layers of the sea where light is plentiful, billions of microscopic plants and animals live. The most common of these organisms are drifting *plankton* that depend on water movement to wash them around. The sea's chain of life is largely dependent on these plankton, which convert sunlight into food.

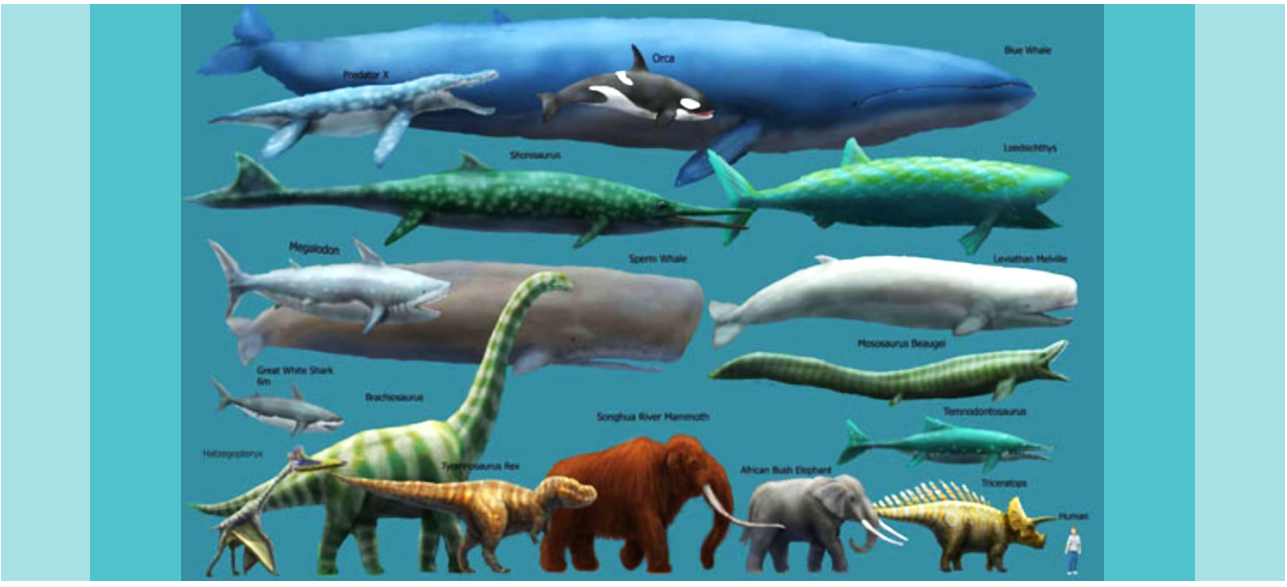
Plankton, Magnified 250 X

They are eaten by small creatures that are then eaten by larger creatures and so on up the food chain. Small creatures survive on plankton, but even humpback whales dine on them. Every plant and animal, no matter where they are in the food chain, is an essential part of a complex and fragile network in which each species depends on other species for its survival.

Some sea animals also use amazing adaptations to catch prey, hide from predators, or to attract potential mates. For example; Certain creatures who live in the dark make a special chemical that produces a blue bioluminescent light that can be used to attract mates or catch prey.

What is the largest animal in the ocean?

The Blue Whale is not only the largest animal in the ocean, but also the largest animal on earth. It weighs 150 tons (**that's as much as 21 elephants**) and twice the size of the largest known dinosaur. It's length can measure 100 feet!



The fastest animal in the sea is the swordfish that can reach speeds up to 68 mph!

The Principal Marine Groups

Draw a line to match the picture to its group

Sponges
Very simple, porous creatures, unable to move about, they absorb oxygen and food from water that passes through them.

Worms
Have no skeletons or feet, some have heads and a hard casing.

Cnidarians
Group that includes jellyfish, anemones and corals.

Echinoderms
Animals with spiny skins like starfish and urchins. Their bodies have five identical parts that branch out like the spokes of a wheel.

Mollusks
Includes mussels, oysters, octopuses, and squids. They have no shells, but some have tentacles.

Crustaceans
Includes crabs, shrimp and lobsters. They are protected by a hard shell and have antennas and jointed legs. Some have pincers or claws for defense.

Fish
The first animals to have a skeleton INSIDE the body. They have scales to protect themselves, fins to help them move about, and gills to filter water and absorb oxygen.

Reptiles
Covered in scales like fish, but do not have gills – so they take in oxygen from the air above water. Most of the species are sea turtles, and a few kinds of snakes and lizards

Mammals
Includes whales and dolphins. They too must breathe the air above water. Millions of years ago, their ancestors lived on the land. To adapt to the ocean that sustained them, they gradually grew longer and their feet turned to flippers.

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Today, more than 200,000 different sea organisms have been identified, but scientists believe as many as 2,000,000 kinds of organisms make the ocean their home. There is so much still to be discovered, and yet at the same time we are also at risk of losing a great number of ocean species.

What are the most plentiful creatures in the sea?

It is the **Krill.** They are small crustaceans 2-3 inches long. In the cold waters of the Southern Ocean, krill live in gigantic groups that look like huge carpets on the ocean's surface. There are an estimated 600,000 billion of these creatures, making them the most populous animals in the world. Our big friend the Blue Whale considers them a delicacy and can eat as many as 40 million krill in one day!

Endangered Marine Species

Fishing has moved farther off-shore and new technologies have enabled fishermen to plumb deeper waters to the detriment of many larger species who are facing extinction. These animals include the manatee, seals, sea lions, turtles, and whales. Drift net fishing can also inadvertently kill dolphins, albatrosses, and other seabirds while hastening the fish stock decline and contributing to international disputes. While overfishing has depleted the once abundant varieties of sea life, human actions have also taken their toll on the quality of our ocean waters.

Ocean Pollution

Ocean Acidification is caused by fundamental changes in seawater chemistry occurring throughout the world's oceans. Since the beginning of the industrial revolution, the release of carbon dioxide (CO_2) from industrial and agricultural activities has increased the amount of CO_2 in the atmosphere. The ocean absorbs about a quarter of the CO_2 we release into the atmosphere every year. As atmospheric CO_2 levels increase, so do the levels in the ocean. Initially, many scientists focused on the benefits of the ocean removing this greenhouse gas from the atmosphere. However, decades of ocean observations now show that there is also a downside — the CO_2 absorbed by the ocean is changing the chemistry of the seawater, resulting in this process called "ocean acidification."

As a species, humans need the oceans to survive. But more and more the oceans will need humans to keep the oceans alive. A dying ocean would mean a dying planet no longer hospitable to living things.

Q: How many krill can a blue whale eat in a single day?

Q: Whales often dine on another small organism, what are they called?

We hear that dolphins sleep like Dave Rearick. Any truth to that?

Indeed there is. Dolphins must return to the surface to breathe. Falling fully asleep could cause them to drown. They deal with this by allowing only one-half their brains to go to sleep at a time. The other half remains awake so the dolphin can go up for air and watch out for predators.

Other Resources:

http://games.noaa.gov/oscar/media/ocean_literacy.pdf
http://www.noaa.gov/ocean.html