WHALES

Whales are among the world's largest mammals. These large marine mammals can be found in every ocean of the world. Whales are not easily studied. Because many whales live "over' the deepest, darkest parts of the ocean and occasionally dive into them, humans have had a difficult time gathering information about many aspects of their life at sea. Scientists have been able to study whales that are kept in aquariums. Studying whales in captivity has been invaluable to our understanding of them in the wild. We have learned much about whale physiology; gas absorption, heat exchange, vision and sonar, all of which could not have been obtained from the wild. This knowledge has been used hand in hand with wild studies and has allowed us to understand how whales accomplish the incredible things they do.

Whales can be divided into two groups: toothed whales and baleen whales. The toothed whales are comprised of 66 generally recognized species. Included in this group are dolphins, porpoises, giant sperm whales, and other whales of intermediate size. All toothed whales have teeth and a single external nostril, or blowhole. As the whales swim on the surface of the water they breathe in air through their blowholes. These whales use their teeth primarily to catch their prey. Most toothed whales swallow their prey whole, without chewing. Some scientists believe that many toothed whales "catch" their prey by making a sound that stuns them. Some whales are deep divers and feed on bottom-dwelling prey. Other whales living in open ocean waters feed on prey found living closer to the surface.

Toothed whales make clicking sounds that are produced by a special organ in their head. Scientists believe that this clicking sound is a form of communication between whales and also acts as a sonar-type device to find food. In addition to the clicking sounds, some toothed whales make other noises, one of which is a whistling sound. Orca and dolphins whistle and make stereotypic "calls." These calls are believed to be used for communication, not echolocation. Clicks seem to be used to find and evaluate prey and the environment.

The second group of whales is the baleen whale. Instead of teeth, these whales have baleen plates. These plates are like huge fringed brushes that hang down from the upper jaw inside the mouth. These baleen plates act as sieve-like food-gathering

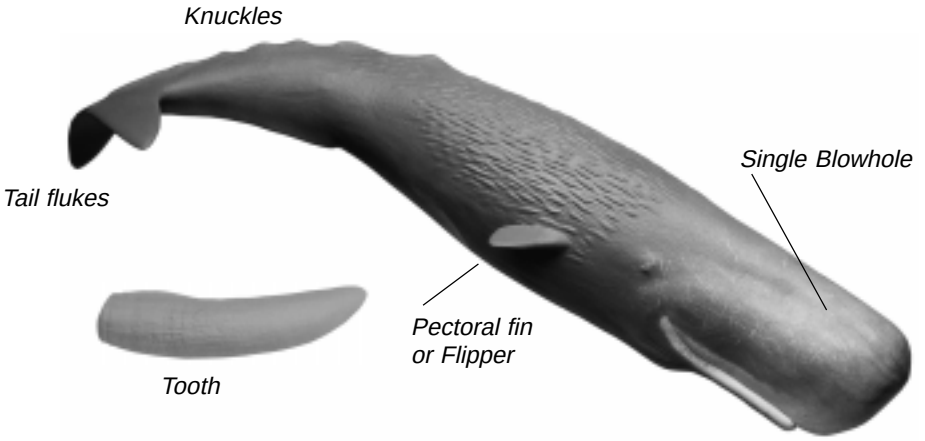
structures. Baleen whales take huge amounts of water into their mouths, bringing with it many small fish and other backboneless organisms called krill. Large baleen whales have a series of folds on the undersides of the throat. These stretchable pleats of skin expand to hold this enormous amount of water. The whale then uses its tongue to forcefully expel the water. The baleen plates act as a filter, keeping the small fish from flowing out of the mouth with the water.

Baleens consume enormous amounts of small prey with every mouthful. They migrate to and from feeding grounds or areas where there are huge schools of small fish and invertebrate organisms. Because these small organisms are present in the upper layers of the ocean, baleen whales tend to travel mainly in the top 300 feet of the water. These whales have two blowholes and most of them have a dorsal fin (the fin on top of the whale).

Unlike fish, whales cannot breathe under water. They must surface to breathe through their blowholes.

Both groups of these giant marine mammals must maintain their warm body temperature in the frigid waters of the seas. The whales have developed an insulating layer of blubber. In some whales the blubber can be a foot or more thick. These enormous mammals have a surprisingly lightweight skeletal system. The bones are soft and filled with oil. Because the water supports much of the weight of the whale, its skeleton is not needed to support its weight. The skeleton acts more like a frame for the muscles.

SPERM WHALE



The Sperm whale is a magnificent whale! The first thing one notices about this gigantic whale is the huge boxlike head. This rectangular-shaped head is 1/3 the size of the body. This whale has one of the largest brains of any creature on earth. Its forehead contains an unusual organ called a spermaceti organ, a complex mass of oil-filled connective tissue and sacs. Scientists are not certain what purpose it serves. Some experts believe the sac in the head of sperm whales is used to control buoyancy and is therefore used in diving. Some think the sperm whale may also use the spermaceti organ to produce the clicking sound used to echolocate (process of determining location by echos of sonar waves) and communicate with other whales. No one has been able to devise a safe method of testing these whales to learn the purpose of this unusual organ.

The average sperm whale is about 50 feet (15 meters) long and can weigh up to 58 tons! The lower jaw of the sperm whale reaches 15 feet (4.5 meters) in length. The sperm whale is an *Odonticeti* or toothed whale. Its mouth contains about 25 conical teeth on each side of the lower jaw. These teeth fit into corresponding sockets in the upper jaw. There are no visible teeth in the upper jaw. A sperm whale's diet consists primarily of squid.

The sperm whale breathes through a single blowhole located near the left front of the head. These whales can be identified by the unique spout that shoots from the blowhole. The sperm

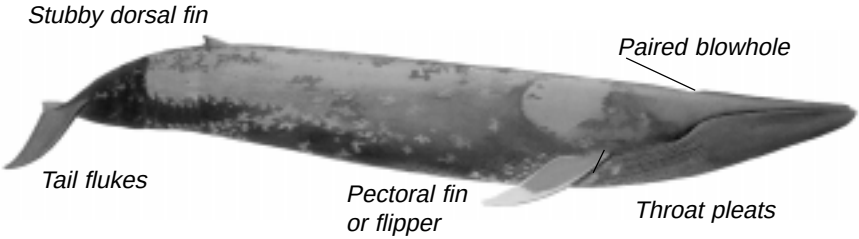
whales spout blows forward into the air at a 45-degree angle.

The skin is dark brown to dark gray on the top portion of the Sperm whales body. The belly area and underside of the mouth is often light gray to white. The skin is rippled over much of its body. Sperm whales have no dorsal fin. They have an angular hump on the back, followed by a series of large, low knuckles extending down toward the tail. The flippers, located behind the head on both sides of the body, are oval shaped and relatively small compared to their gigantic body. The tail of the sperm whale is thick, broad and triangular in shape. It has a notch in the center. In a large sperm whale, the width of the two flukes, or tail fins, could measure as large as 13 feet (4 meters).

Sperm whales can dive to depths of over 3,000 ft (909 meters) and remain under water for over an hour. Before a lengthy dive, a sperm whale will remain on the surface for about 10 minutes, blowing every 10 to 30 seconds, then raising its flukes high out of the water to begin another dive. Sperm whales attack, catch, and eat the largest of all deep-sea invertebrate creatures, the giant squid. Giant squid reach 58 feet (17.5 meters) in length.

Sperm whales are found in all oceans except the polar ice fields. It has been suggested that their migrations are determined by the water temperature and the abundance of squid.

BLUE WHALE



The blue whale is, as its name implies, blue-grey in color, with gray mottling. It is believed to be the largest animal to have ever lived. The average blue whale grows 70 to 85 feet (21.2 to 25.7 meters) long and can weigh from 90 to 125 tons! The body of a blue whale is long and cylindrical. For such a large whale, it has a small dorsal fin, about 13 inches high. The fin is located three-quarters of the way back from the head. The flippers are narrow, long and slender; they can be 10 feet (3 meters) long. The tail is

relatively small for the huge body; it can be 15 feet (4.5 meters) from tip to tip.

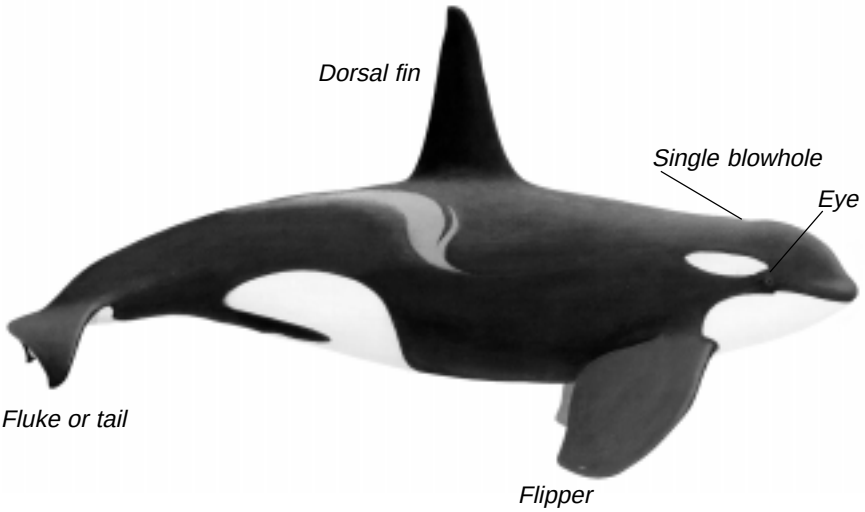
The blue whale has a giant heart about the size of a small car. Its stomach is large enough to hold over 2 tons of krill (shrimp-like crustaceans). A full-size blue whale must eat 2 tons of food a day to maintain its weight. Blue whales can dive to at least 350 feet (106 meters) to find food.

The blue whale is a baleen whale. It has 300 baleen plates on each side of the upper jaw. The plates are usually black. It has more than 40 pleats in the underside of its throat. Like all baleen whales, the blue whale has two blowholes.

Blue whales live in all oceans of the world. Blue whales living above the equator migrate north to feed in the summer, and south in the winter. Whales that live south of the equator migrate south in the summer and north in the winter.

Through complete protection over the last 22 years, the blue whale's population now appears to be increasing.

KILLER WHALE



Killer or orca whales are the largest of the dolphin-like whales and are probably the best known of all whales. There are quite a few orcas in captivity. They can be seen performing in

aquatic theme parks around the country. They can be trained to do acrobatic tricks, but it is rare to see them do the things they are trained to do in captivity out in the wild.

Killer whales have large, powerful bodies. The average male can grow 25 to 29 feet (7.5 to 8.7 meters) long from snout to tail and can weigh up to 14 tons. Its head has a single blowhole and a broad, rounded snout and is relatively small for its body. It has an amazingly large dorsal fin for its body; about 6 feet (1.8 meters) high. Orcas have large, paddle-like flippers sometimes measuring 6 feet (1.8 meters) long and 4 feet (1.2 meters) wide. The tail is large and thick; notched at its center.

These unique whales are black with a large white area that extends along the lower side, from chin to tail. There is a distinctive white spot located behind and above the eyes. Killer whales also have a light gray to white “saddle patch” on their backs behind the dorsal fin. This saddle patch is often used in orca research to identify individual whales.

The orca is a toothed whale with 10 to 13 conical teeth on each side of each jaw. Its diet includes other large whales, dolphins, seals, sea lions, walruses, sea otters, sea birds, turtles, and a wide variety of fish. The killer whales have not been known to attack humans.

The orca travels in groups called pods which are permanent, close-knit families of males, females, and young. Orca scientists have discovered that orca tend to stay with the family or clan into which they were born. Often the oldest member of the clan is a female. Orca pods appear to be matrilineal - with old females as pod leaders. Long-term observation confirms a regularity of habits and feeding patterns. Killer whales have been known to hunt in packs in order to kill whales larger than themselves.

Killer whales can be found in all oceans. They appear to stay within 500 miles (833.3 kilometers) of the shoreline and will enter inland seas, bays, and estuaries.

Sperm Whale Color Suggestion

Dark brown to dark gray. Belly and underside of mouth are often light gray to white.

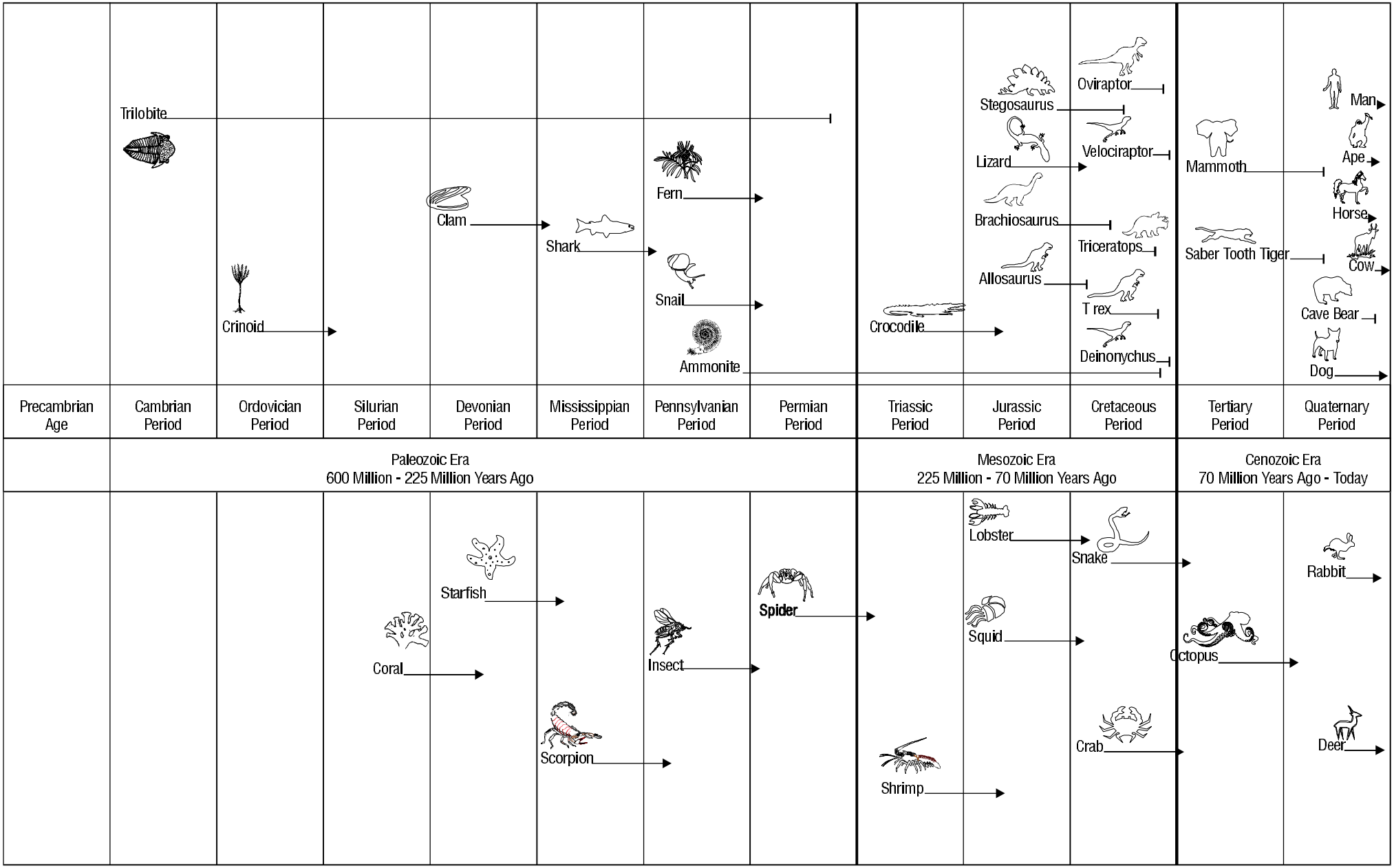
Blue Whale Color Suggestion

Blue gray with gray mottling.

Killer (Orca) Whale Color Suggestion

Black with large white areas that extend along the lower side from chin to tail. White spot located behind and above the eyes. Light gray to white saddle patch on back behind dorsal fin.

Time Line



Still Exists

Extinct

Origin and extinction dates are approximate and should only be used for general estimates.

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