



NATIONAL AQUARIUM IN BALTIMORE.

Conservation Education Department
Pier 3, 501 East Pratt Street
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Fast Facts

- ❑ The baleen whales are among the largest animals to ever live.
- ❑ Sperm whales dive for up to an hour to depths of 1000 meters or more.
- ❑ Cetaceans can see in air as well as in water.

Key Terms

Baleen - Instead of teeth, some kinds of whales filter food out of the water using flexible, fringed plates in their mouth called baleen.

Cetaceans - toothed and baleen whales.

Ask the Aquarium

*Fact Sheets from the
Conservation Education Department*

Whales

"Smiling" dolphins, "mysterious" blue whales, "playful" killer whales - whales capture our imagination. Like all mammals, they breathe air with lungs, have hair, bear live young, nurse with milk from mammary glands, and maintain a constant, warm internal body temperature. The cetaceans - toothed and baleen whales - evolved from land mammals millions of years ago and have unique solutions to the problems of mammals living in the sea.

Cetaceans are generally found in the ocean. The larger whales may venture into cold polar waters, while most dolphins and porpoises frequent warmer waters. Four dolphin species live in fresh water in large tropical rivers, such as the Amazon.

Feeding

Whales are carnivores (meat-eaters) that eat smaller animals. The toothed whales include the dolphins and porpoises, beaked whales, pilot whales, beluga whales, narwhals, orcas, and the sperm whale. Most feed on schooling fish and squid they catch with sharp, cone-shaped teeth. The orca, or killer whale, eats larger fish and occasionally small marine mammals such as seals. Another small whale, the beluga, catches crustaceans and molluscs. Whales use their teeth mainly for gripping their prey rather than chewing it. In fact, some of these whales have very worn down teeth or no teeth at all and are still able to feed.

The baleen whales are among the largest animals ever to live, yet they



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feed on small prey they capture in great quantities with a unique feeding structure called baleen. Baleen is a flexible, fringed comb made of the protein keratin. Hair, whiskers, claws, and hooves are also made of keratin. Hundreds of baleen plates hang in rows from the whale's upper jaw with a hard edge facing out and a fringed side facing in.

Baleen is used in three different ways. Bowhead and right whales swim constantly with their mouths open. Tiny animals called zooplankton are caught on the baleen hairs as the water flows between the sheets and out the corners of the jaw. These animals function as giant plankton nets. They can be recognized by their "upside down smile".

The second group of baleen whales captures larger zooplankton, including shrimp-like krill and small schooling fish, by engulfing a great mouthful of water and straining out the food, again trapping their prey on the hairs of the baleen. The hairs are more coarse because the prey is larger. The great blue whale,

the fin whale, and the humpback are all members of this group. They have "pleats" on their throat that allow it to balloon when they engulf a mouthful of water and prey.

A third strategy using baleen is employed by the gray whale, which swims on its side, along the bottom, scooping up and straining out animals living on or near the bottom. It has short, very coarse baleen.

Insulation

It is hard to maintain a warm internal temperature while living in cooling water. Whales have a heavy insulating layer of fat below the skin called blubber, and must eat large amounts of food to maintain the thick blubber and for energy. Blubber is also useful as stored food energy. Whales can store energy in the form of fat when food is plentiful and live off their blubber when food is scarce.

Breathing

Although all whales must surface to breathe air, some can dive deeper and stay down longer than others. For example, while dolphins stay near the surface, sperm whales dive up to an hour to depths of 1000 meters or more. While diving, a reflex response causes the heart rate to slow and shuts off blood flow to the muscles, saving oxygen-rich blood for the brain and heart. While underwater, whales may build up an "oxygen debt" by producing energy in their muscles without using oxygen. When they come up, they remain at the surface for a bit to repay this debt.

Baleen whales have two "nostrils" in their blowhole. Toothed whales have only one opening in their blowhole. Unlike people, whales are voluntary breathers; the blowhole stays closed unless the whale actively opens it.

Swimming

Dolphins, porpoises, and whales have lost their hind limbs and have tail fins called flukes that are horizontally flattened. As their tail moves up and down, the animals are pushed through the water. Their flippers steer and stabilize. A streamlined shape helps them slip through the water.

Hearing

In the darkness of the sea, sound is also used for communication with other members of the same species. Humpback whales' songs, blue whales' low-pitched booms, belugas' chirps and trills, and dolphins' whistles are all means of cetacean communication. The very low-pitched sounds of the blue whales may travel for hundreds of miles through the water.

Seeing

Cetaceans can see in air as well as in water. Many whales stick their heads out of water and appear to be taking a look around. The behavior is called spyhopping.

Reproducing

Whales normally have one offspring per year or every other year. They bear their young in the water. Many whales migrate from cold feeding grounds to warmer seas so their offspring can start life in warm water. Newborn calves lack thick blubber layers and cannot keep warm as easily as adults.

Whale calves nurse on very rich milk squirted from nipples hidden within a slit in the mother's belly. The rich milk helps develop an insulating layer of blubber. Because sharks or killer whales may attack the babies, many whales appear to cooperate in the protection of young. Some live in a small group called a pod.

PLAY! The New Dolphin Show

The Aquarium's new dolphin show will bring you into the dolphins' world – a world of learning, interaction, and play. You'll learn how dolphins learn the skills they need to survive as they chase, leap, splash, and tumble with one another and with our trainers. We hope the program will give you a new understanding of how dolphins learn and develop.

Most of all, we want you to experience what it's like to work with these magnificent animals!

Check out our interactive Web site at www.aqua.org/play to:

- Meet the Dolphins
- Watch video of our dolphins in action.
- Become a dolphin trainer online.