

OIMB GK12 Curriculum

5th grade

60 minutes

CETACEAN INTRODUCTION AND FEEDING (BALEEN)

Oregon Science Content Standards:

- 5.1L.1. Explain that organisms are composed of parts that function together to form a living system
- 5.2L.1. Explain the interdependence of plants, animals, and the environment, and how adaptation influences survival

Ocean Literacy Principles:

- 5. The Ocean supports a great diversity of life and ecosystems

Goals:

- Introduce students to cetaceans and some of the many different kinds
- Learn how baleen whales feed

Concepts:

- Cetaceans are a group of marine mammals including whales, dolphins, and porpoises.
- There is a great diversity of cetaceans.
- Many whales feed by using baleen.

Materials:

- PowerPoint about whales
- Baleen (available from OIMB)
- Videos of whales feeding
<http://www.youtube.com/watch?v=vJvfjiCTvq4>
<http://www.arkive.org/humpback-whale/megaptera-novaeangliae/video-08a.html>
- Shallow pans of water (enough for one per group of students)
- Ground pepper to sprinkle over pans of water
- One comb per group of students

Background:

Cetaceans are mammals including whales, dolphins, and porpoises. Dolphins and porpoises are actually small whales. Cetaceans have several adaptations to living in the ocean, including streamlined bodies, reduced hair, and a tail adapted as a fluke for propulsion. They also have fused bones in the front “hands” that make great flippers for swimming, and they have a layer of blubber for insulation and an energy reserve. They breathe through blowholes on the top of their heads, so they can stay submerged (baleen whales have two blowholes, toothed whales have

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one). Since they are mammals, all cetaceans have live birth, feed their young milk, are warm-blooded, breathe air, and have some hair (very little).

There are two main groups of cetaceans: toothed whales and baleen whales. Toothed whales include dolphins, porpoises, killer whales, sperm whales, pilot whales, and more. Baleen whales include blue whales, gray whales, humpback whales, right whales, minke whales, and more. Toothed whales eat things like fish, squid (sperm whales eat giant squid), seals, or sea lions. Baleen whales use the baleen (a comb-like fringe that hangs from the upper jaw, made out of keratin, same as our fingernails) to filter out and eat small fish, shrimp, krill, and zooplankton.

There are 2 general baleen feeding strategies: skimmers and gulpers.

Skimmers: Right whales are an example of skimmers. Right whales have 2 rows of long (~8 ft) baleen hanging from their top jaw. They swim through a patch of zooplankton with their mouths open and use the baleen to skim their prey from the water. They periodically sweep their tongue along the backs of the baleen, and then swallow the captured prey.

Gulpers: Humpback whales exhibit gulper feeding. They have short baleen (~2 ft). They open their mouths wide, taking in a huge gulp of water. They then close their mouths, sieving out the water and retaining their prey. Gulpers have pleated throats that expand like an accordion to take in huge volumes of water. A special gulping tactic is to excavate: Excavators, such as gray whales, dive to the bottom, turn on their side and suck in a gulp of bottom sediment. They use their short baleen plates to filter the sediment and water to capture prey such as amphipods and tube worms living in the bottom sediment.

Toothed whales use their teeth to help capture prey, but generally swallow their prey whole (fish and squid). Because prey of toothed whales is often larger and more mobile, their feeding often requires more co-operation and learning. This might be one reason why the young of many toothed whale species stay with their mothers longer than young of baleen whales.

Lesson Plan:

1. Start by having the students work in pairs or as a class to describe what they know about whales.
2. Discuss the descriptions the students give. Go over information from the background section.
3. View provided PowerPoint of feeding, anatomy, and diversity of cetaceans.
4. Discuss the differences between toothed whale feeding and baleen whale feeding.
5. Show the students pieces of baleen (available from OIMB).
6. Talk about the differences between 'skimmer filter' feeding in Right Whales and 'gulp and sieve' feeding in humpback whales.
7. Show video(s) of humpback whales hunting and feeding. Groups of humpback are known to sometimes corral schools of fish with net bubbles.

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<http://www.youtube.com/watch?v=vJvfjiCTvq4>

<http://www.arkive.org/humpback-whale/megaptera-novaeangliae/video-08a.html>

8. Have students act out skimmer feeding. Set out shallow containers of water with pepper sprinkled on the top. Have students first run their fingers through the water. Very little pepper will be “captured”. Next have students run a comb through the water, representing baleen. A lot of the pepper should be “captured”.

Assessment: Have students write down whale adaptations and methods of feeding. If you would like to turn the introduction to cetaceans into a project, have pairs or small groups of students pick a type of whale and research some basic information, such as how and what it eats, where it is found, how large it is, etc. Students can write a report or make a poster, and the groups can present the information about their whale to the class.

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