



LESSON 2

Marine Mammals

Grades 4 to 7

This lesson addresses the learning outcome from the science IRP: Relate structure and behaviour of local organisms to their survival.

Objectives

- Describe what a mammal is.
- Identify an orca and a porpoise, label the parts of a toothed whale and describe what and how it eats.
- Identify a baleen whale and describe what and how it eats.
- Demonstrate how a baleen whale eats.
- Differentiate between seals and sea lions.
- Learn different orca behavior.

Materials

Mammal, Bird and Invertebrate Cards from *Ocean Animal Clue Cards in Beach Explorations* by Gloria Snively, Kingfisher Press

Pictures of baleen and toothed whales (from books *Whales* by Melvin and Gilda Berger and *Whales, Dolphins and Porpoises of British Columbia, Canada* by Fisheries and Oceans Canada and *Zoobooks: Whales* by John Bonett Wexo)

Station 1. Orca model or picture (Use a post card, picture or rubber model that can be found at the Vancouver aquarium) with cards labelled: dorsal fin, tail flukes, blowhole, pectoral fins or flippers

Station 2. Pictures of seals and sea lions (Book: *Seas and Sea Lions: An Affectionate Portrait* by Vicki Leon has some good photos; Fisheries and Oceans has a seals and sea lions poster that is also good)

Station 3. Orca puppet; Pictures of orcas showing different behaviours

Station 4. Whale baleen, container, spice (oregano), and fine-toothed comb; Cards to make a food chain: sun, phytoplankton, zooplankton, herring, salmon, orca and humpback whale.

Station 5. Tuning fork; Puffin Porpoise Discovery Box (from Haida Gwaii Museum)

Concepts

- All mammals have 4 defining characteristics.
- Marine mammals have different adaptations to live in the ocean.
- Fish and whales have many differences.
- How echolocation works.
- What and how baleen and toothed whales eat.

Activities

1. Introduction

Use *Ocean Animal Clue Cards* and pictures to show different mammals as you discuss them.

What are the 4 characteristics that define a mammal?

A. Born live, drinks milk from its mother, has hair, is warm-blooded

What are some examples of mammals that live on Haida Gwaii?

A. Mouse, bear, deer, beaver, ermine, etc.

What is a marine mammal? Think of some examples of marine mammals.

A. A marine mammal is a mammal that spends most of its life in the ocean. Examples include humpback whales, seals, sea lions, etc.

Do you know any marine mammals that live here around Haida Gwaii?

A: gray whales, seals, sea lions, humpback whales, orcas, sea otters used to. (Learn more about sea otters in the kelp forest lesson.)

How do marine animals keep warm?

A. They can have a thick layer of fat called blubber and/or lots of fur.

Which marine mammals have fur? Blubber? Both?

A. Sea otters only have very thick fur. Whales have blubber and almost no hair. Sea lions and seals have both fur and blubber.

What are differences between seals and sea lions? Show pictures of both.

A. Seals have small flippers and they are very awkward on land. Seals move by wiggling along on their bellies. Seals also have no external ear flaps. Sea lions have longer flippers and walk more easily on land using all four flippers. Sea lions also have external ears flaps.

How do whales eat?

A. Whales are either toothed or baleen whales, describing what tools they have to eat with. Toothed whales have teeth to catch and eat prey. Instead of teeth, baleen whales have a comb-like structure called baleen in their mouths. They scoop up mouthfuls of water or mud and sift small food items (plankton and small creatures etc) out from the water or mud.

Activity Stations

Station 1. Fish versus Whale

Have pictures or drawings of an orca and a fish. Compare an orca to a fish. How are they different?

- Orca tail is horizontal and fish tail is vertical. They move differently too.
- The fish has gills and must stay in water and the orca breathes air with lungs.
- Orcas don't have anal fins like fish have.
- Orcas have a large dorsal fin and fish have a small fin on their back.
- Orcas are mammals and fish are not.

Place the labels on the model or diagram to name the parts of an orca. Discuss what each part is for:

- Blowhole – for breathing, on top of head to make breathing easier
- Flippers or Pectoral Fins – for steering and turning
- Dorsal fin – for balance, makes whale more hydrodynamic
- Tail Fluke – “motor” for forward momentum and power

Station 2. Seals and Sea Lions

Look at the picture of a seal and a sea lion. How are they alike? How are they different from each other?

- They are both marine mammals with fur and blubber, and they both like to eat fish.
- Seals have smaller flippers than sea lions.
- Sea lions have external ear flaps and seals do not have them.

Station 3. Orca Behaviour

Orca behavior – Try out some of the following orca behaviors with the orca puppet:

- Breaching – The whale rises out of the water and splashes back in.
- Fluking – Whales often raise their flukes above the water before they dive.
- Spy hopping – Some whales spy hop. They raise their heads vertically out of the water to get a better look around. They rise until their eyes are just out of the water.
- Logging – Whales “log” at the surface to rest. When a few whales log together they face the same direction and stay in a close group. Whales have to stay semi-conscious to breathe.
- Tail-Lobbing – The whale slaps its tail fluke on the surface of the water while the rest of its body is under the water.

Station 4. Baleen versus Toothed Whales

Try picking up the spice (oregano) with the comb. This is how baleen works. Look at the pictures of baleen whales. Think about how baleen whales are different from toothed whales. What do they eat and how do they eat?

Resident Orca food chain

Draw arrows showing the direction the energy moves. It starts with the sun. Phytoplankton makes food using the sun's energy. The zooplankton eats the phytoplankton. The herring eats the zooplankton. The salmon eats the herring. The orca eats the salmon.



Baleen Whale food chain

Draw arrows showing the direction the energy moves. It starts with the sun to phytoplankton to zooplankton (especially krill) to humpback whale. Make sure the arrow follows the direction the energy goes.

Station 5. Echolocation & Porpoise Teeth

Look at the porpoise jaw and teeth in the Puffin Porpoise Discovery Box (from the Haida Gwaii Museum). What do they use their teeth for?

A: Porpoise use their teeth to catch and hold fish. They swallow their prey whole. They don't use their teeth for chewing. Neither do other toothed whales.

Look at the different prey. What does a porpoise eat?

A: Herring, shrimp, squid, sardines.

What creatures are not porpoise prey items?

A: Jellyfish, razor clam, snail.

Why don't porpoises eat them?

A: Because they swallow their prey whole a razor clam could cut, a jelly could sting and a moon snail may be too big to swallow.

Notice the location of the blowhole in the skull. Why would they breathe from a hole on top of their heads rather than in the front?

A: It takes less energy to move the top of their heads slightly out of the water to breathe rather than lifting the whole head up.

What is echolocation? What animals use it?

A: Echolocation means using sound to locate things. Porpoises and bats are two animals that use echolocation. Porpoises make clicks through their blowholes and the sound waves from the clicks hit the prey and bounce back to the porpoise. From these sound signals, the porpoise can tell the size, shape and distance of the prey and the direction it is moving.

Try hitting the tuning fork and placing it gently on your jaw bone. Feel the vibrations. A porpoise's jawbone is used to transmit sound to their ear. What do you think porpoises need to use echolocation for?

A: For communication and locating food.

Conclusion

- Review the answers for each Station.
- Students or the teacher may want to demonstrate some whale behaviours.
- Students can describe the difference between seals and sea lions.



Marine Matters Curriculum 3
Lesson 2 • Marine Mammals • Grades 4 – 7

Activity Station Worksheet

Station 1. Fish versus Whale

Animals are classified into different groups according to different characteristics. Fish and whale have different adaptations to live in water. Name at least 5 differences between fish and whales.

- 1.
- 2.
- 3.
- 4.
- 5.

Label the parts of an orca (whale) on the model or diagram.

Station 2. Seal and Sea Lion

What are some differences between seals and sea lions? Look at the different body shapes and adaptations. Look at pictures of seals and sea lions for clues.

- 1.
- 2.
- 3.

Station 3. Orca Behaviour

Read about the orca behaviours and list 4 here. Be prepared to demonstrate orca behaviours using the puppet.

- 1.
- 2.
- 3.
- 4.



Marine Matters Curriculum 3
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Activity Station Worksheet

Station 4. Baleen versus Toothed Whales

Try picking up the spices (oregano) with the fine-toothed comb. This is how baleen works.

Look at the pictures of baleen whales. What do they eat?

How are baleen whales different from toothed whales?

Make a **Humpback Whale Food Chain** and an **Orca Food Chain** using the items on the cards. Draw arrows between the items showing the direction that the energy moves.

Station 5. Porpoise Teeth and Echolocation

Look at the porpoise jaw and teeth. What do they use their teeth for?

Look at the different prey. What do porpoise eat?

Try hitting the tuning fork and placing it gently on your jaw bone. Feel the vibrations. A porpoise's jawbone is used to transmit sound to their ear. What do you think porpoises need to use echolocation for? How do they echolocate? Why do they echolocate?