

Dear Teacher:

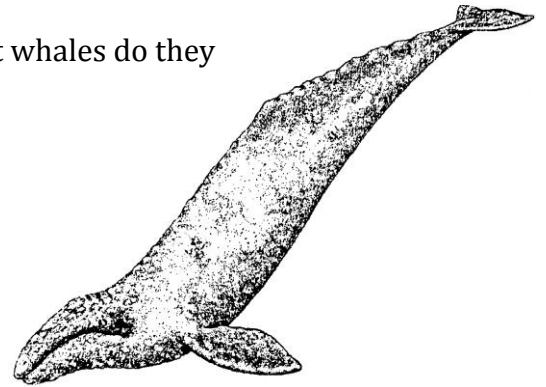
During the **Tales of Whales** assembly program one of our education staff members will focus on toothed and baleen whales and their adaptations for survival. After this program your students will understand the difference between toothed and baleen whales and be familiar with the characteristics of killer whales and gray whales. They will compare size, color and feeding adaptations as they compare themselves to these magnificent mammals using puppets, songs, a PowerPoint presentation, bones, blubber and two life-sized inflatable whales.

Before your assembly program:

- Ask students of their experiences with whales. What whales do they know or have they seen?
- Color the [Gray Whale](#) and [Orca coloring sheets](#).
- [What Makes a Mammal a Mammal](#) Activity
- [Where Do Whales Fit In?](#) Activity

After your assembly program:

- Review the differences between toothed and baleen whales using the [Gray Whale](#) and [Orca fact sheets](#).
- [Measuring Whales](#) Activity
- [Where Do Whales Fit In?](#) Activity



Participating in this program and using the pre and post curriculum will help your students meet Oregon science standards and Ocean Literacy Principles.

Tales of Whales Assembly: Grades K-2

Goal: To understand that whales are marine mammals and describe how they survive in the ocean.

Cognitive Objectives:

1. Explain what makes whales mammals.
2. Explain that marine mammals have adaptations that help them survive in the ocean environment.
3. Explain how whales breathe, move and stay warm.
4. Compare and contrast toothed whales and baleen whales.

Affective Objectives:

1. Students will value whales as worthy of protection and conservation.
2. Students will be inspired to learn more about whales.

Oregon Science Standards Correlations:

- K.2P.1 Examine the different ways things move.
- 1.1L.1 Compare and contrast characteristics among individuals within one plant or animal group.
- 1.2L.1 Describe the basic needs of living things.
- 2.1L.1 Compare and contrast characteristics and behaviors of plants and animals and the environments where they live.

Background Information

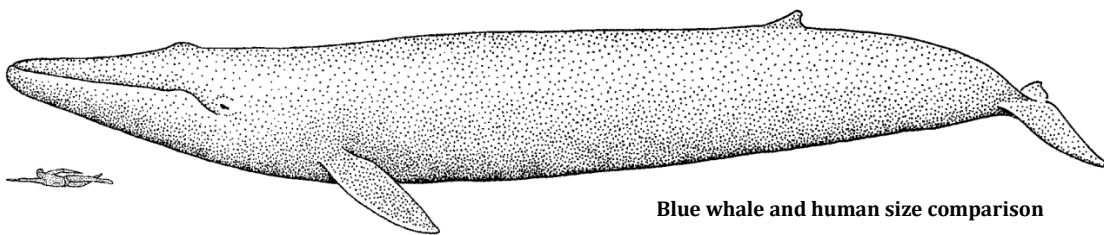
What is a marine mammal?

The colossal blue whale, active sea otter, barking sea lion, plant-eating manatee and even the polar bear are all marine mammals. They share a number of characteristics with their land-dwelling relatives: they are warm-blooded, give birth to live young, nurse their young, have hair at some time in their lives on some part of their bodies, and breath air.

But marine mammals differ from land mammals in that their livelihood depends upon the ocean. They have bodies that are particularly well suited to life at sea. Ears, limbs, mammary glands and sex organs have all been streamlined to reduce drag as these animals swim through the ocean. Except for sea otters, marine mammals have a thick layer of fat called **blubber** under their skin. This aids buoyancy, provides insulation and serves as a reserve energy source for most marine mammals. To keep themselves warm, they also have a specialized circulatory system with an adaptation called **countercurrent heat exchange**, in which blood cooled by exposure at the body's extremities is warmed as it flows next to warm blood moving out from the body's core.

The Cetaceans: whales, dolphins and porpoises

Whales, dolphins and porpoises are all marine mammals that belong to the scientific order Cetacea (*seh-TAY-shah*). The word "cetacean" is derived from the Greek word *cetus*, which means whale. Altogether, 75 species of cetaceans have been identified and divided into eleven families. They include the largest animal on earth, the blue whale which reaches lengths of 80-100 feet and weighs as much as 150 tons. A blue whale is so big, an African elephant, the largest land animal, could stand on its tongue! In contrast, the smallest whale is the Commerson's dolphin, which measures four to five feet and weighs only 100 pounds. Whales are able to reach these large sizes because the surrounding water provides them with support—giving them the potential to grow larger than a land mammal.



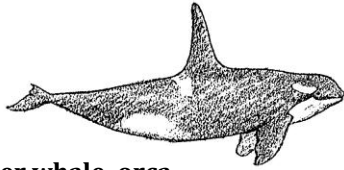
Blue whale and human size comparison

As a group, whales are unique among the mammals as they spend their entire lives in water. They have all the characteristics of mammals—they are warm blooded, give live birth, nurse their young, have traces of hair or fur, and must come to the surface to breathe air using lungs—yet they are distinctive in their appearance and survival strategies.

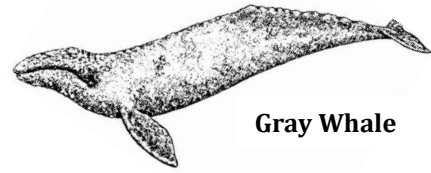
Whales live in all of the oceans of the world. Some species, such as the beluga whale, may travel into large rivers. Other species, such as the gray whale, migrate with the seasons; others remain year-round in the same habitats, where they find their preferred food.

A few whales of our coast

Whales can be separated into two groups according to how they feed:



Killer whale, orca



Gray Whale

Toothed whales Examples: dolphins, orcas and sperm whales	Baleen whales Examples: gray, humpback and blue whales
Use teeth to rip and tear; swallow their food whole	Use baleen plates to strain out small animals for food
Have a single blow hole	Have two blow holes
Swim fast	Swim slowly
Relatively small whales	Relatively large whales
Form pods	Live alone or swim in small groups
Have a noticeable dorsal fin	Have a very small dorsal fin

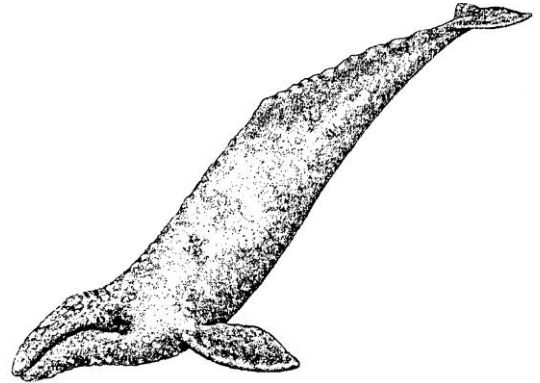
Gray whales are baleen whales that migrate past the Oregon coast twice a year. During late January and early February, female gray whales give birth to 15-foot calves in the shallow, warm lagoons of Baja California, Mexico. As March approaches, the gray whale population starts to migrate north to its summer feeding grounds off Alaska. A few spend the summer along the Oregon coast. Then in November and December, as the waters freeze over, gray whales start south again.

Killer whales, or orcas, are toothed whales found in all oceans of the world and are sighted off the Oregon coast periodically. The diet of orcas consists primarily of whatever kinds of fish are in the vicinity. They may also eat seals, sea lions, walruses, sea otters, dolphins, penguins and other sea birds, sea turtles, and other whales.

Gray Whale

What does gray whale look like?

- Gray whales have long football-shaped bodies.
- They are light to dark gray, however the white barnacles and orange whale lice that live on their skin make them look blotchy.
- Gray whales have 10-12 bumps on their backs, called dorsal knuckles.



How big are they?

- Females can grow up to 49 feet long.
- Males can grow up to 48 feet long. A full grown male will almost always be smaller than a full grown female.
- At birth, a gray whale calf is 15-17 feet long and weighs about 1,500 to 2,000 pounds.

Where do they live?

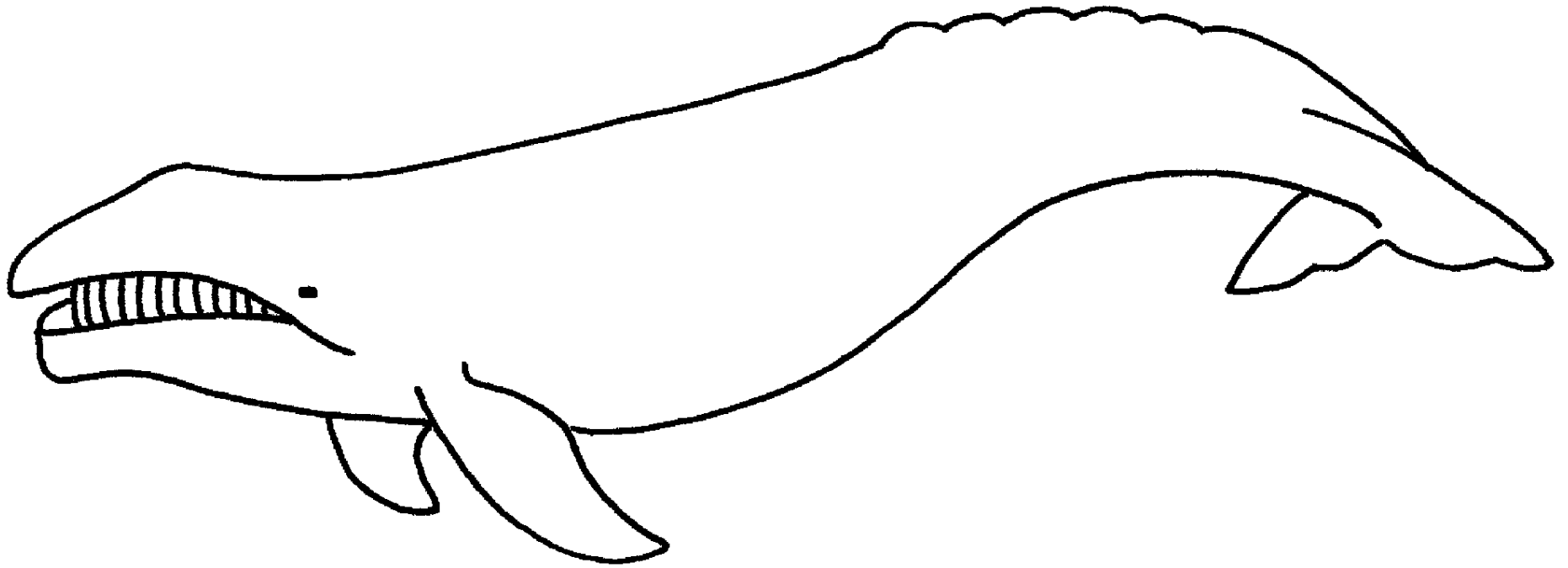
- Gray whales are found off the coast of western North America.
- Each year gray whales make up to a 12,000 mile round-trip from the cold waters of Alaska to the warm lagoons of Baja California, Mexico. This is the second longest migration of any mammal.

What do they eat?

- Gray whales scoop up mouthfuls of mud and sand from the ocean bottom, filtering out tiny shrimp-like animals called amphipods and various other invertebrates including worms.

Did you know?

A gray whale eats about 67 tons of food during the five months it spends in chilly northern waters. Sixty-seven tons would be equal about 33,500 quarter-pound hamburgers

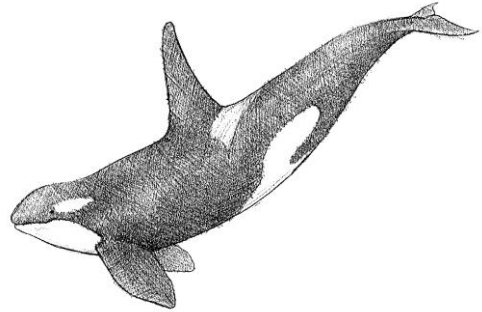


Gray Whale

Killer Whale (Orca)

What does a killer whale look like?

- Killer whales have long, torpedo-shaped bodies.
- They are black, with a white patch behind each of their eyes.
- They have a gray patch, called a saddle patch, behind the dorsal fin.
- A killer whale's belly, lower jaw and the undersides of their tail flukes are white.



How big are they?

- Females can grow up to 25.5 feet long.
- Males can grow up to 29.5 feet long.
- A killer whale calf is about eight feet long, and weighs between 300 and 400 pounds when it is born.

Where do they live?

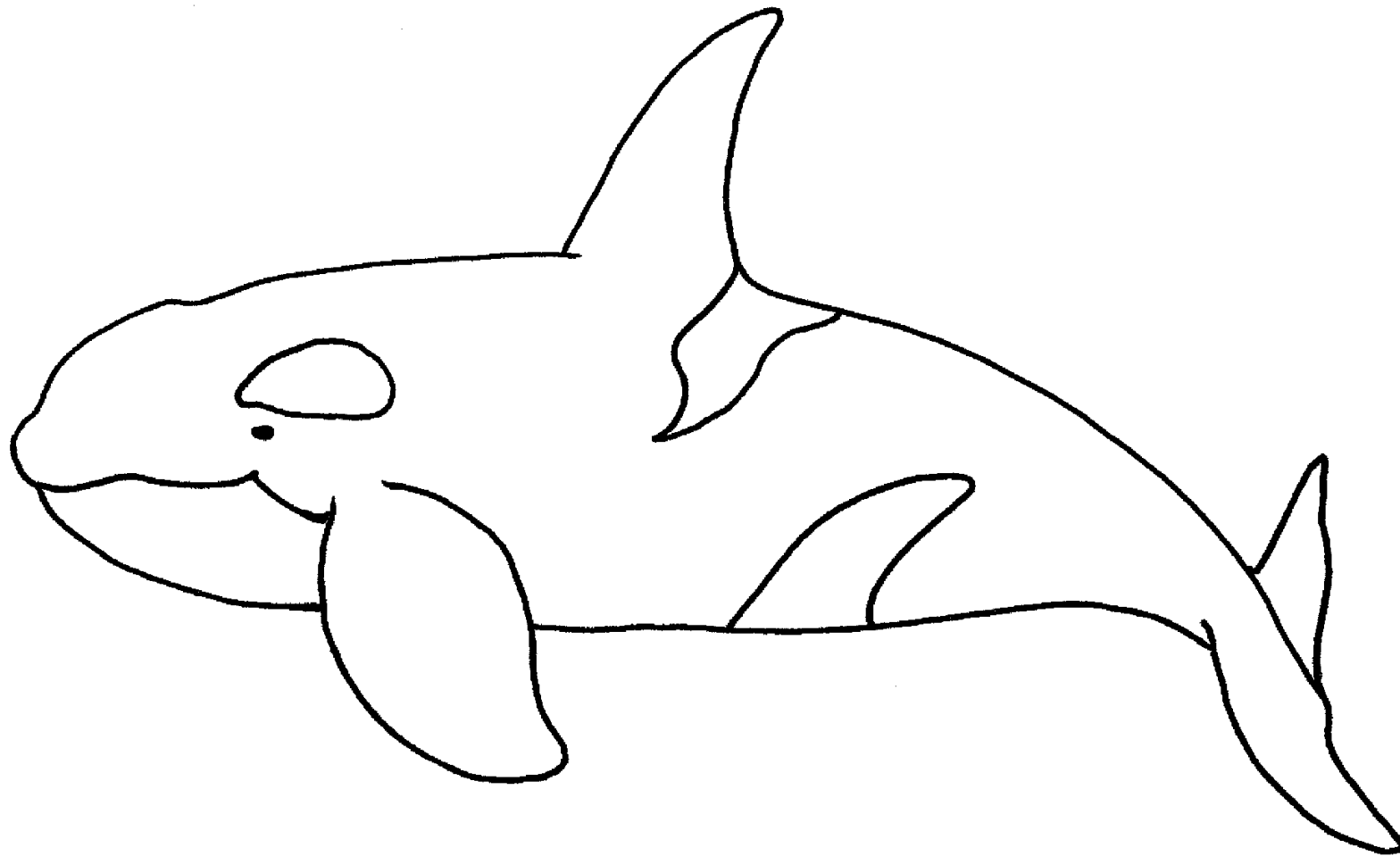
- Killer whales live in all oceans of the world but are most commonly found in cold water where there is a lot of food for them to eat.

What do they eat?

- Most killer whales eat a wide variety of fishes and squid, but the diet of some killer whales includes seals, sea lions, walruses, sea otters, dolphins, penguins, seabirds, sea turtles and other whales.

Did you know?

- The scientific name for killer whales is *Orcinus orca*, which is why many people call them "orcas."
- Killer whales are the largest member of the dolphin family.



Killer Whale (Orca)

What Makes A Mammal A Mammal?

Lesson at a glance:

This activity will allow students to discover that mammals are a class (group) of animals, that mammals have certain characteristics that distinguish them from other classes of animals and that there are many different kinds of mammals. They will also understand that all mammals share two characteristics that make them unique from other animal groups: they have hair and feed their babies milk. They will also understand that mammals also share most of these other characteristics: breathe air, are warm blooded, give live birth, have a backbone, and have four limbs (arms, legs, flippers, paws).

Oregon Content Standards:

SCIENCE

- **First Grade:** 1.1L.1 Compare and contrast characteristics among individuals within one plant or animal group.
- **Second Grade:** 1.1 Structure and Function: Living and non-living things have characteristics and properties.
- **Third Grade:** 3.1 Structure and Function: Living and non-living things vary in their characteristics and properties.

Ocean Literacy: Essential Principles and Fundamental Concepts

5. THE OCEAN SUPPORTS A GREAT DIVERSITY OF LIFE AND ECOSYSTEMS.

Materials:

- ❑ A pen or pencil for each group of 4-5 students
- ❑ Sets of four pictures of different kinds of mammals labeled 1-4 (one set per group)
- ❑ A copy of **What Makes A Mammal?** worksheet for each group of 4-5 students
- ❑ A copy of the work sheet, **Who Are the Mammals?** for each student

Background:

This activity will allow the students to begin thinking about the characteristics of mammals. Explain to the students that scientists divide animals into classes or groups based on the traits or characteristics they share. Mention that these classes might include birds, reptiles, fish, mammals and amphibians. For the next few minutes they will imagine that they are scientists looking at pictures of previously undiscovered animals. Their job is to try and decide what characteristics these animals share in common.

Activity:

Preparation:

1. Using magazines or old calendars make a set of four mammal pictures for each group of 4-5 students.
2. Label each picture Animal One, Animal Two, Animal Three or Animal Four.

Activity:

1. Divide the class into cooperative-learning groups of 4-5 students.
2. Give each group a pencil and a **What Makes A Mammal?** worksheet.*
3. Have the group designate a recorder.
4. Hand out the sets of mammal pictures.
5. Give the students 15 minutes to answer the questions on the worksheet about each mammal.
6. Have each group designate a presenter.
7. Have each group share what they discovered about the traits of mammals.

* For younger students, unable to read/write, do this activity as a larger teacher-directed group.

Summary:

1. Review what the students found out about the animals on their pictures.
2. As a group, decide which characteristics make these animals mammals.
3. Now, have the students fill out the worksheet: **Who Are the Mammls?**
4. Discuss their results. How did the students decide which animal was a mammal? Which characteristics did they look for?

What Makes A Mammal? Worksheet

Animal One

1. How does this animal stay warm? _____
2. How does this animal move? _____
3. How does this animal give birth? _____
4. What does this animal feed its baby? _____
5. How does this animal get oxygen? _____

Animal Two

1. How does this animal stay warm? _____
2. How does this animal move? _____
3. How does this animal give birth? _____
4. What does this animal feed its baby? _____
5. How does this animal get oxygen? _____

Animal Three

1. How does this animal stay warm? _____
2. How does this animal move? _____
3. How does this animal give birth? _____
4. What does this animal feed its baby? _____
5. How does this animal get oxygen? _____

Animal Four

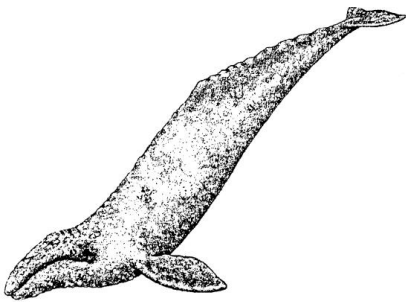
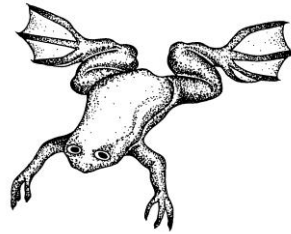
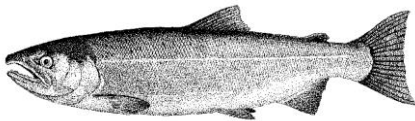
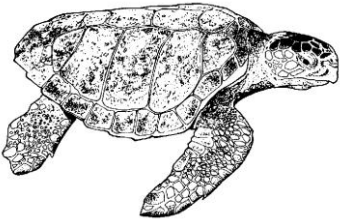
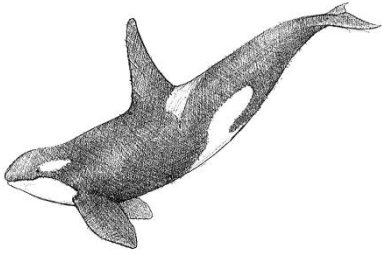
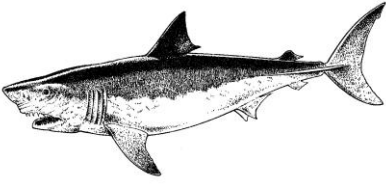
1. How does this animal stay warm? _____
2. How does this animal move? _____
3. How does this animal give birth? _____
4. What does this animal feed its baby? _____
5. How does this animal get oxygen? _____

List four things that these four animals have in common:

1. _____
2. _____
3. _____
4. _____

Who Are the Mammals?

Circle the mammals.



Measuring Whales

Lesson at a Glance:

Students will measure the lengths of a group of whales and compare each animal's size.

Oregon Content Standards:

SCIENCE

- **First Grade:** 1.1L.1 Compare and contrast characteristics among individuals within one plant or animal group.
- **Second Grade:** 1.1 Structure and Function: Living and non-living things have characteristics and properties.
- **Third Grade:** 3.1 Structure and Function: Living and non-living things vary in their characteristics and properties.

MATH

- **Kindergarden:** K.1.2 Connect numbers, including written numerals, to the quantities they represent, using various physical models and representations.
- **Second Grade:** Use rulers and other measurement tools to estimate and measure length in common units.

Ocean Literacy: Essential Principles and Fundamental Concepts

5. THE OCEAN SUPPORTS A GREAT DIVERSITY OF LIFE AND ECOSYSTEMS.

- 5.a. Ocean life ranges in size from the smallest virus to the largest animal that has lived on Earth, the blue whale.

Materials:

- ❑ One 100-foot length of clothesline or rope
- ❑ Cable ties
- ❑ Single hole punch for each group
- ❑ Permanent marker for each group
- ❑ Measuring tape for each group
- ❑ Laminating materials (optional, but recommended)

Background information:

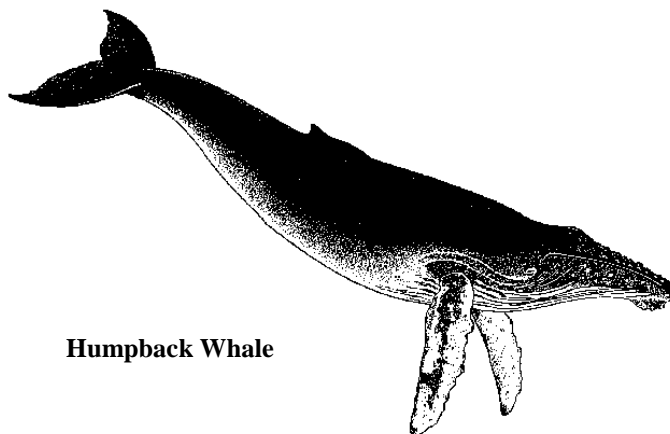
The lengths used for this activity come from a variety of resources and are currently accepted record lengths for these animals. If your students choose to pursue further research on these animals they may find resources with slightly different information.

In many groups of animals, one sex is different from the other; for instance, hens and roosters are different in size and plumage. This is called sexual dimorphism. With toothed whales (such as dolphins, porpoises and sperm whales), the males are typically larger. With baleen whales (such as gray and blue whales), the females are typically larger.

Here are the lengths of the animals included in this activity (on the cards provided in this kit), plus some additional lengths (in *Italics*) that you may choose to add on your own. We have provided the lengths for males and females when that information was available.

Whales	Accepted maximum lengths
<i>Vaquita (male)</i>	5 feet
*Harbor porpoise	6 feet
*Pacific White-sided dolphin	8 feet
<i>Boto (river dolphin)</i>	9 feet
<i>Bottlenose dolphin (female)</i>	12 feet
Bottlenose dolphin (male)	12.5 feet
<i>Beluga whale (female)</i>	13.5 feet
<i>Narwhal (female)</i>	16.5 feet
Beluga whale (male)	18 feet
<i>*Short-finned pilot whale (female)</i>	18 feet
<i>*False killer whale (male)</i>	19.5 feet
Narwhal (male, not including tusk)	20.5 feet (tusk – up to 10 feet)
*Short-finned pilot whale (male)	22 feet
<i>*Killer whale (female)</i>	25.5 feet
*Killer whale (male)	29.5 feet
<i>*Minke whale (female)</i>	35 feet
<i>*Baird's beaked whale (female)</i>	42 feet
<i>*Sperm whale (female)</i>	56 feet
<i>*Gray whale (male)</i>	48 feet
*Gray whale (female)	49 feet
<i>*Northern right whale (male)</i>	54 feet
<i>*Humpback whale (male)</i>	57.5 feet
*Northern right whale (female)	60 feet
*Humpback whale (female)	62.5 feet
*Sperm whale (male)	65.5 feet
<i>*Fin whale (female)</i>	88.5 feet
*Blue whale (male)	101.5 feet
<i>*Blue whale (female)</i>	110 feet (record length, rare)

* Found off of our coast.



Humpback Whale

Activity:

1. Before class, cut out the pictures, laminate them (to prevent from tearing when attached to rope), and punch a hole near the top for the cable tie.
2. Divide students into as many groups as there are animals to measure out OR have your class make three of the same rope and then compare the measuring accuracy of each finished rope.

Group instructions:

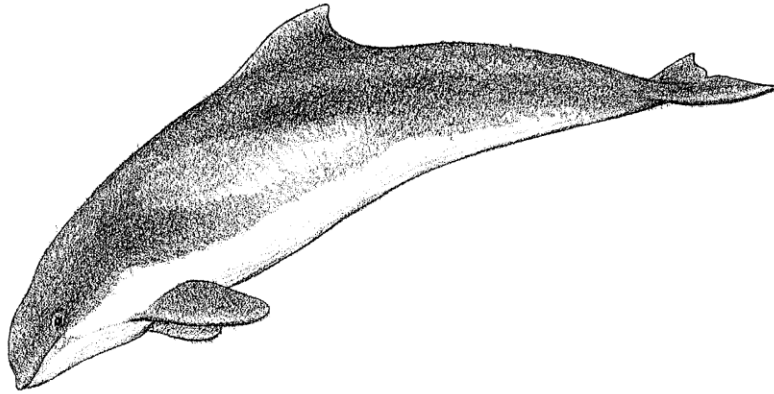
1. Have students unravel their rope, preferably in a hallway or gymnasium.
2. Have students take turns using the measuring tape, marking the measurement and attaching the length cards with the cable ties.
3. Make sure that they tie the knot loops for their cable ties as they go. If they wait until all the marks are made, their final lengths on the rope won't be accurate, since they will have shortened the rope as they tie each knot.
4. Explain that they will begin to measure the length of each whale from the end of the rope. The end of the rope is every whale's tail and the mark on the rope (where the tag is hung) is the tip of the whale's face.

Conclusion:

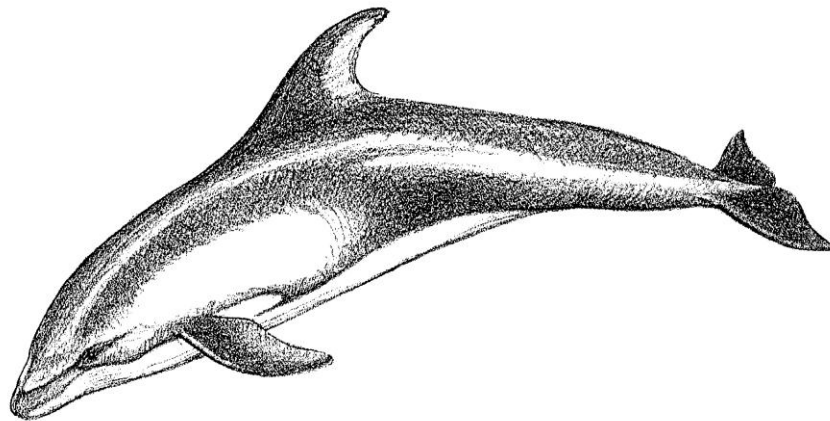
Have each group share their rope with the rest of the class, by having one student stand at each whale tag as they hold up the rope.

Extension:

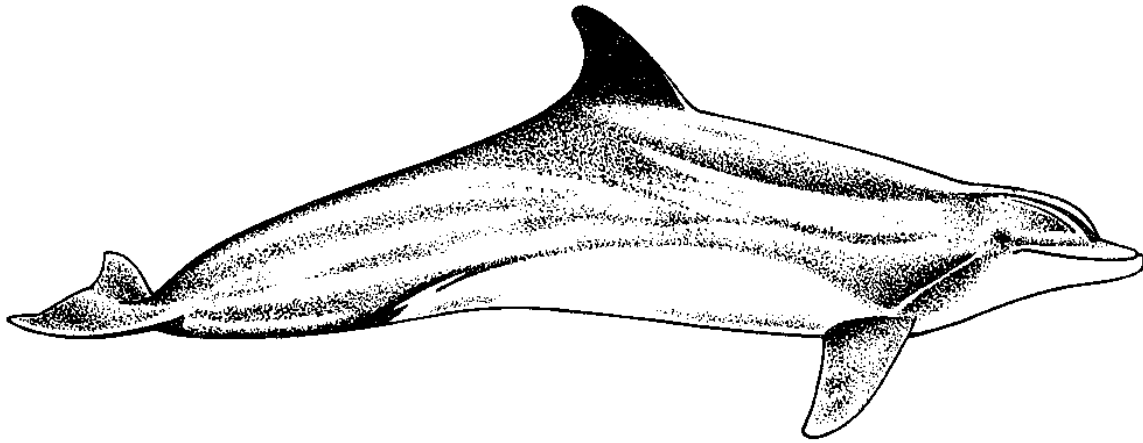
1. Have students convert the lengths in feet into inches, yards, meters, centimeters.
2. Add the shorter male and female lengths to the rope. Discuss sexual dimorphism.
3. Have students look up the lengths of other animals or things they are familiar with and add them to the rope. For example, find the length of a school bus or the average height of a fourth grader.
4. Have students use the library and the Internet to find the weights of the whales on their rope.
5. Have students calculate how many of each whale (nose to tail) it would take to reach one end of the hallway or gymnasium to the other.



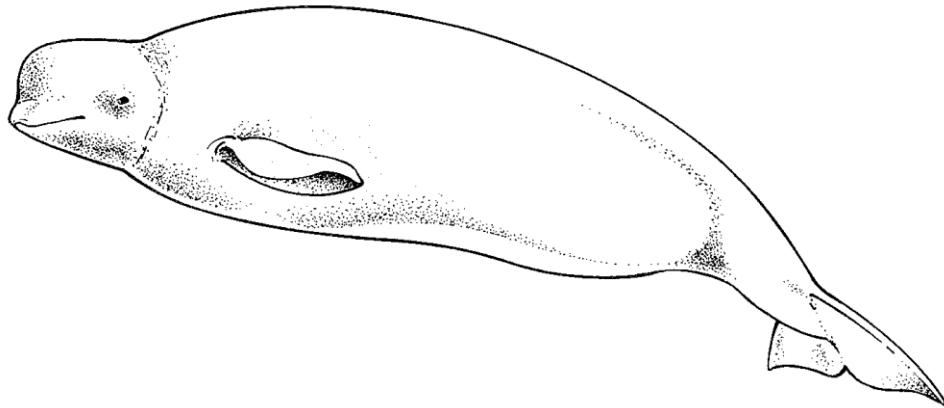
Harbor porpoise
Up to 6 feet



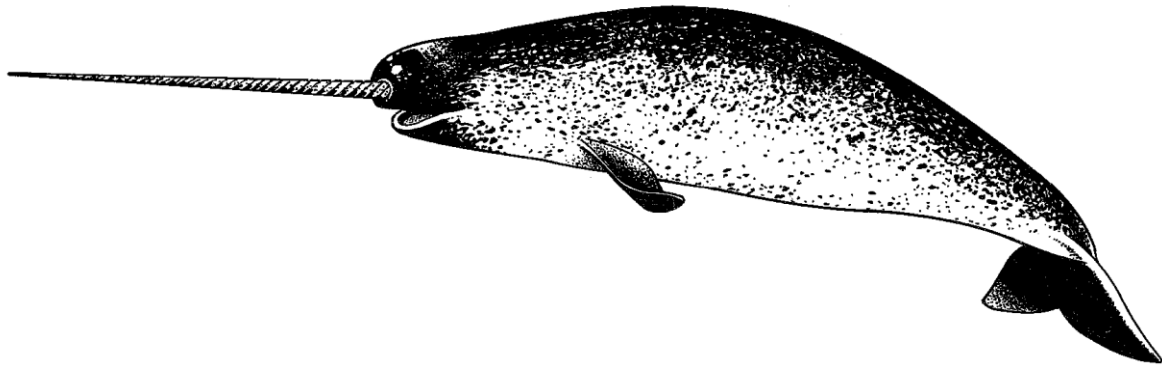
Pacific white-sided dolphin
Up to 8 feet



Bottlenose dolphin
Up to 12.5 feet



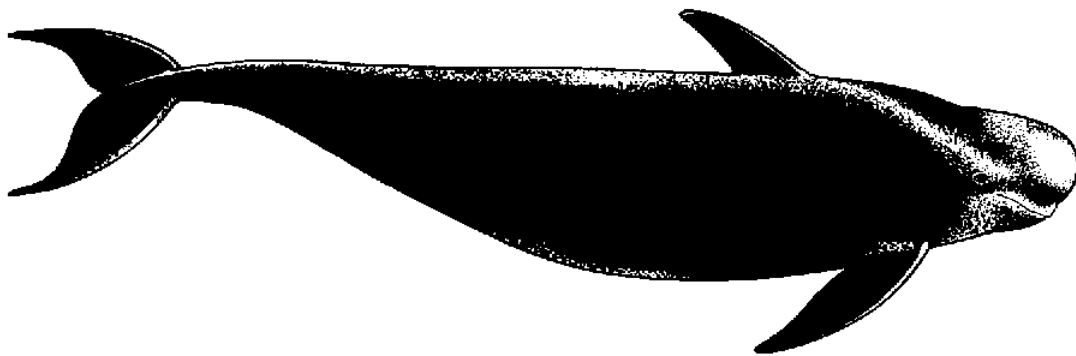
Beluga whale
Up to 18 feet



Narwhal

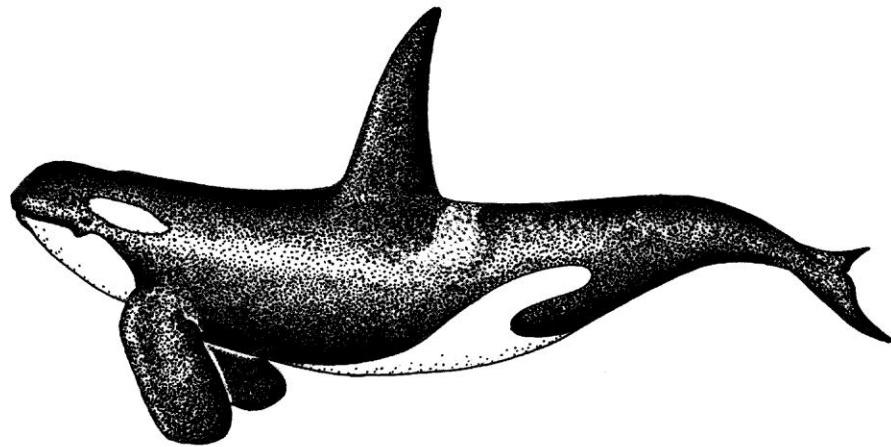
Up to 25.5 feet (not including tusk)

Tusk may grow up to 10 feet.

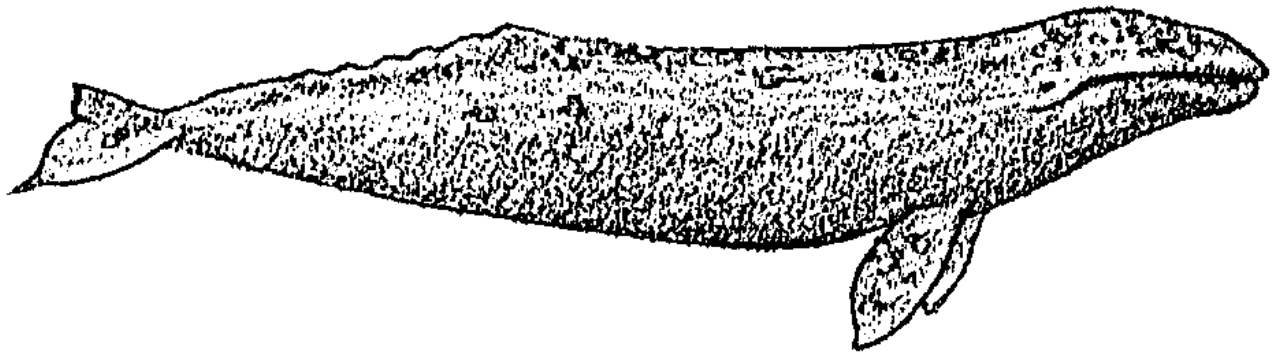


Short-finned pilot whale

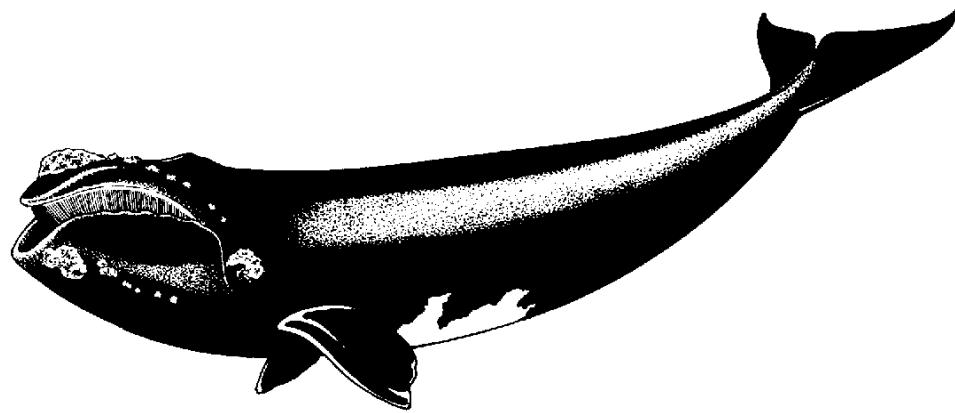
Up to 22 feet



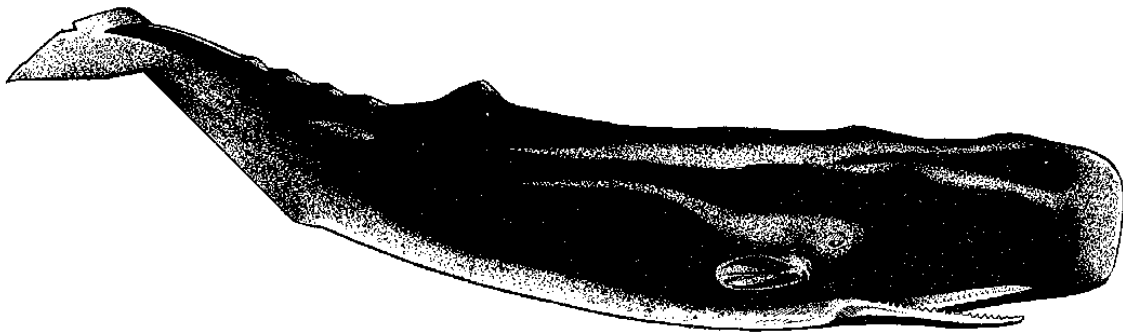
Killer whale (Orca)
Up to 29.5 feet



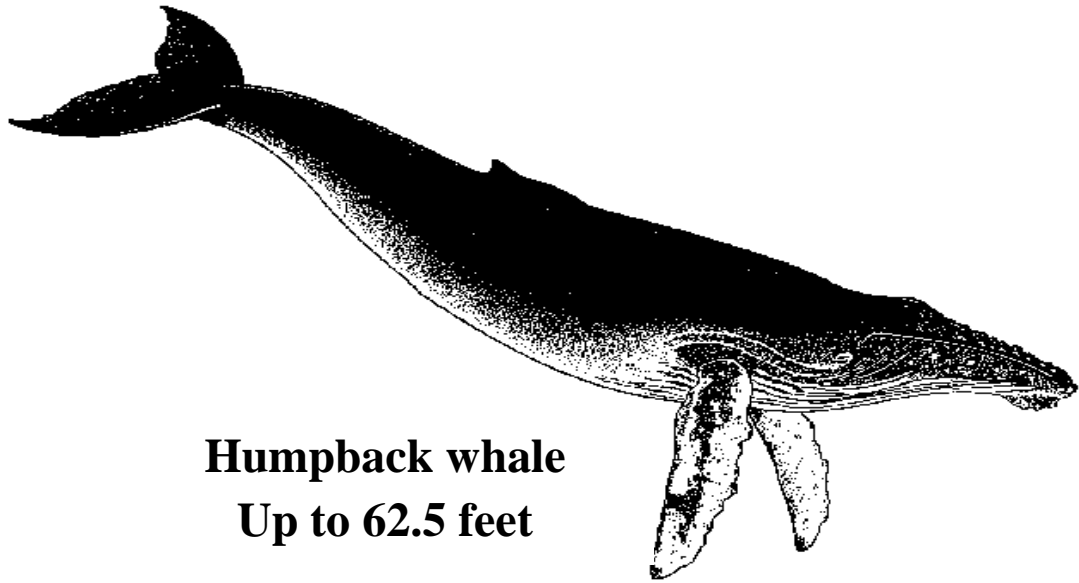
Gray whale
Up to 49 feet



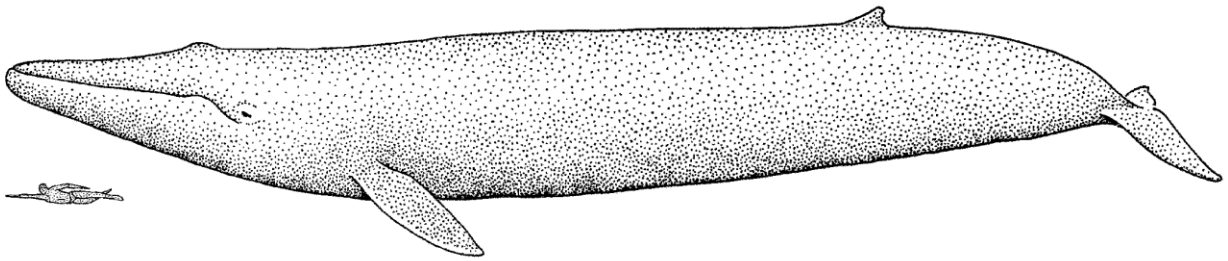
Northern right whale
Up to 60 feet



Sperm whale
Up to 65.5 feet



Humpback whale
Up to 62.5 feet



Blue whale
Up to about 100 feet
(Record – 110 feet!)

Where Do Whales Fit In?

Lesson At a glance:

Students will be able to recognize that humans and whales are both mammals and that they share common characteristics but they are adapted to live in different habitats.

Oregon Content Standards:

SCIENCE

- **First Grade:** 1.1L.1 Compare and contrast characteristics among individuals within one plant or animal group.
- **Second Grade:** 2.1L.1 Compare and contrast characteristics and behaviors of plants and animals and the environments where they live.

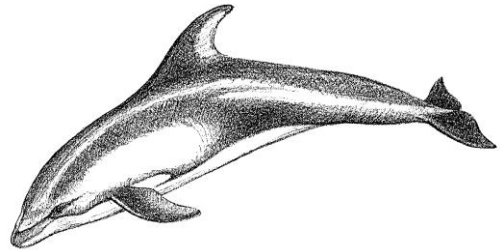
Ocean Literacy: Essential Principles and Fundamental Concepts

5. THE OCEAN SUPPORTS A GREAT DIVERSITY OF LIFE AND ECOSYSTEMS.

- 5.d. Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.

Materials:

- ❑ A **Where Do Whales Fit In?** worksheet for each group of 4-5 students
- ❑ A pen or pencil for each group of 4-5 students
- ❑ White board
- ❑ An erasable marker



Background:

Plants and animals are arranged into groups based on their characteristics. There are many ways plants and animals can be classified. For example, they might be grouped as land or aquatic plants or animals, active by day or by night, useful or nuisance, etc.

However, taxonomy, the study of scientific classification, attempts to classify animals based on their actual relationships and shared characteristics. Taxonomic scientists do this by studying the plant's and animal's anatomy and physiology. For example, research has shown that sea turtles belong with snakes and lizards, while porpoises and whales belong in the mammal group, and neither are fish. Classification can change from time to time as new evidence emerges and as scientists change their minds about where to draw lines between groups.

Activity:

1. Divide the class into cooperative-learning groups of 4-5 students.
2. Give each group a worksheet and a pen or pencil.
3. Have each group designate a recorder.
4. Have each group brainstorm as many characteristics of humans as they can and list them in the circle labeled humans.
5. Have each group brainstorm as many characteristics of whales as they can think of and list them in the circle labeled whales.
6. Have the group list the characteristics that both groups share in the center of their work sheet.

Summary:

Review what the students placed in their diagram by drawing a larger Venn diagram on the white board and adding all groups' characteristics.

Extension:

Do this activity before and after the "Tales of Whales" presentation. Would the students change or add anything to the diagram? Why or why not?

**Where Do Whales Fit In?
Worksheet**

