

# For Creative Minds

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## What makes an animal a mammal?

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Just as we can sort money or candy, scientists sort or classify all living things into groups to help us understand and connect how things are related to each other. Scientists ask questions to help determine what group things belong to.

Based on the answers to the questions, scientists can classify living organisms. The first classification is Kingdom. There are five commonly accepted kingdoms: Monera, Protista, Fungi, Plantae, and Animalia. All the living things in this book belong to Animalia or the animal kingdom.

The next big classification is a Phylum. One of the first questions a scientist would ask is whether the animal has (or had at some point in its life) a spinal column. If the answer is “yes,” the animal is a vertebrate. If the answer is “no”, the animal is an invertebrate. The animals in this book are all vertebrates.

Each Phylum is divided into classes, such as mammals, birds, reptiles, fish, or amphibians. The animals in this book are all mammals.

All mammals are **warm-blooded** and breathe **air**.

They have **hair**.

All mammals protect their young and feed their babies on **mother’s milk**.

There are about 4,000 types of mammals. Most mammals live on land. People are one type of mammal. Cats and dogs are mammals. So are many farm animals, such as cows, goats, and horses. Zoo animals like monkeys, kangaroos, and hippos are mammals. Bats are mammals that can fly. Marine mammals are mammals that live in the ocean like the animals in this book.

Scientists sort marine mammals into three groups or “orders:”

**Cetaceans** are whales and dolphins.

**Carnivora** are polar bears, sea otters, and the pinnipeds (seals, sea lions, and walruses).

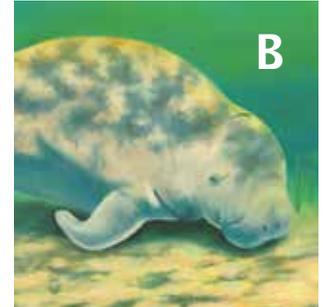
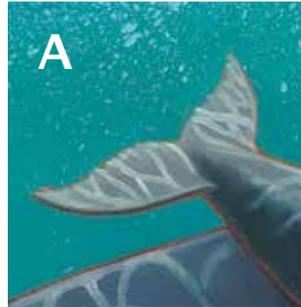
**Sirenians** are manatees and their relatives, the dugongs.



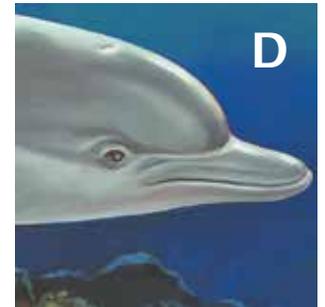
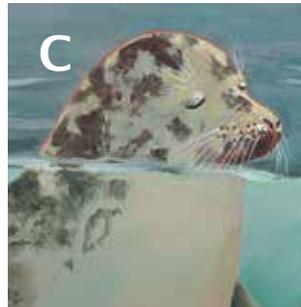
# Adaptations

Adaptations help animals to live in their habitat: to get food and water, to protect themselves from predators, to survive weather, and even to help them make their homes. Marine mammals have special adaptations so they can live in the ocean. Can you match the adaptations that help mammals live in the ocean? Answers are upside down, below.

**1** Marine mammals are able to store oxygen longer than land mammals so they can stay underwater for longer periods.



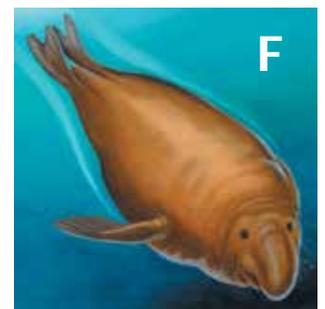
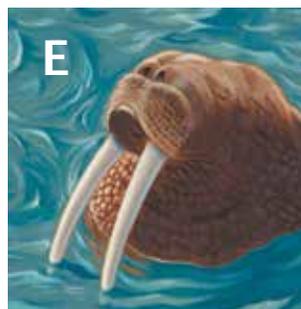
**2** A blowhole at the top of the head helps dolphins and whales to breathe easily while swimming. They can keep their heads underwater to watch for predators or food while they breathe! Some cetaceans have one blowhole while others have two.



**3** Nostrils stay closed when marine mammals swim.

**4** Dolphins' and whales' tails (called flukes) move up and down to help them swim. They use their front flippers to steer.

**5** Walruses use their tusks to help pull themselves up onto shore.



**6** Manatees use their paddle-like front flippers for swimming or "walking" along on the ground. Sometimes they even use their flippers to hold things and to bring food to their mouths!

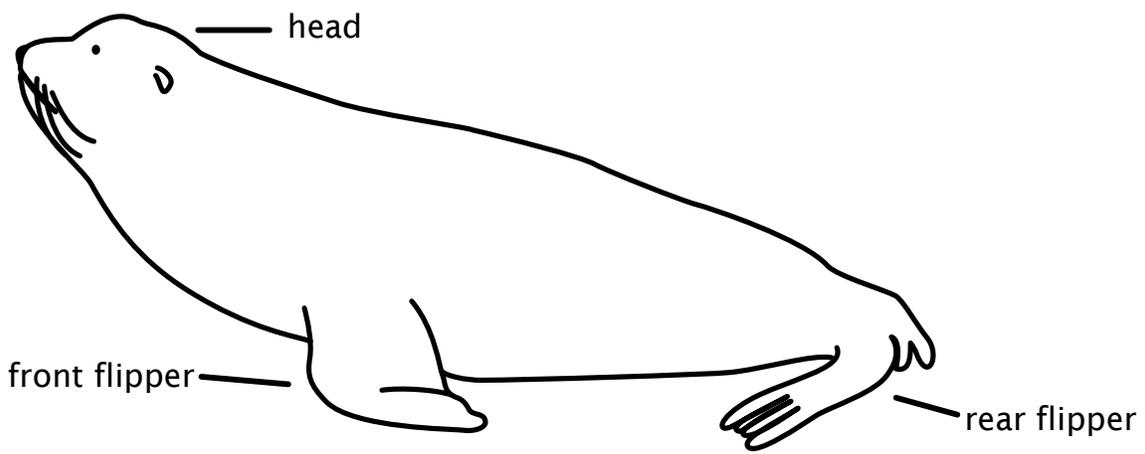
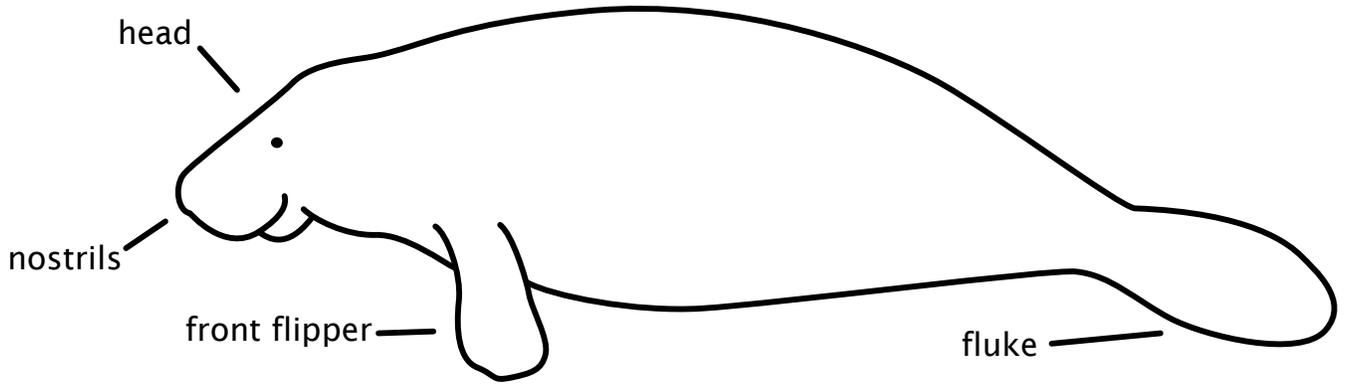
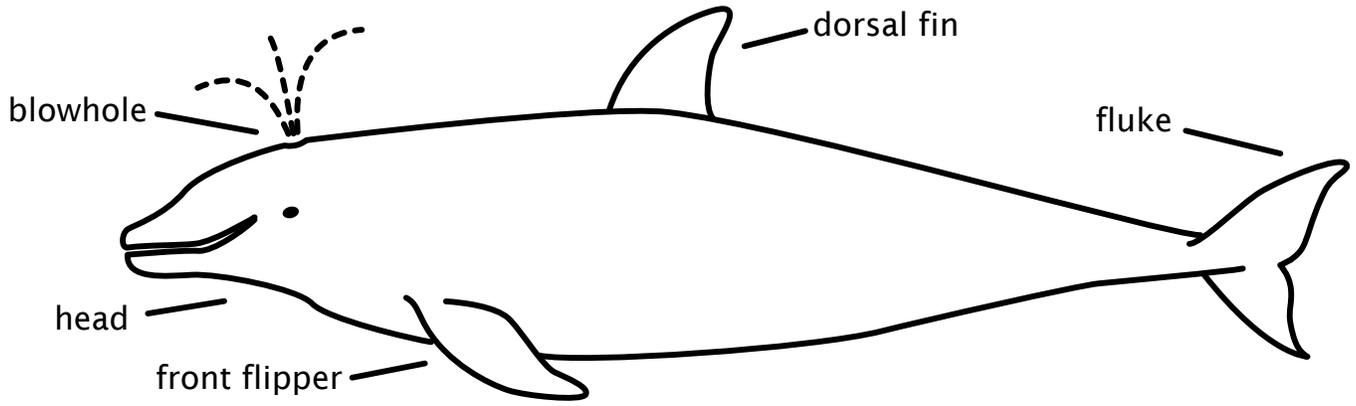


1 - F, 2 - D, 3 - C, 4 - A, 5 - E, 6 - B

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## Body Parts

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## Sleeping

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All mammals—those that live on land and in water—share the need for sleep. We humans should be experts on sleep—after all, we spend about a third of our lives sleeping! We all know how it feels to be tired. We enjoy the renewed energy that we feel after sleeping. Because of these feelings, most people think we sleep to rest our muscles. If resting our muscles was enough, we could watch TV or read all night. But we cannot live without sleep. Why? Scientists think our brains require sleep to keep working.

Since whales and dolphins swim day and night, they don't appear to sleep. But studies of these mammals show that they can sleep while they swim! They are able to let one side of their brain sleep while the other side stays awake. Scientists call this "unihemispheric sleep" because one (uni) half (hemi) of their brain is sleeping. For these mammals, being "half asleep" is more than just a light-hearted expression!

Some seals are also able to be "half asleep." These marine mammals often sleep on the shore, but they can sleep in water, too. When they sleep in the ocean, harbor seals, fur seals, and walrus get into a position that lets their bodies bob at the surface with their snouts in the air.

Elephant seals have the most unusual sleeping habit. These mammals spend months at sea, mostly in the deep layers of the ocean. Scientists think these amazing divers sleep while they are in the depths. They can actually go as long as two hours without breathing air because oxygen is stored in their blood and spleens! When elephant seals are in the dream stage of sleep, they suspend their breathing entirely. Scientists call this "sleep apnea." Oddly enough, when elephant seals are sleeping on land, they also suspend their breathing during the dream portions of their sleep.

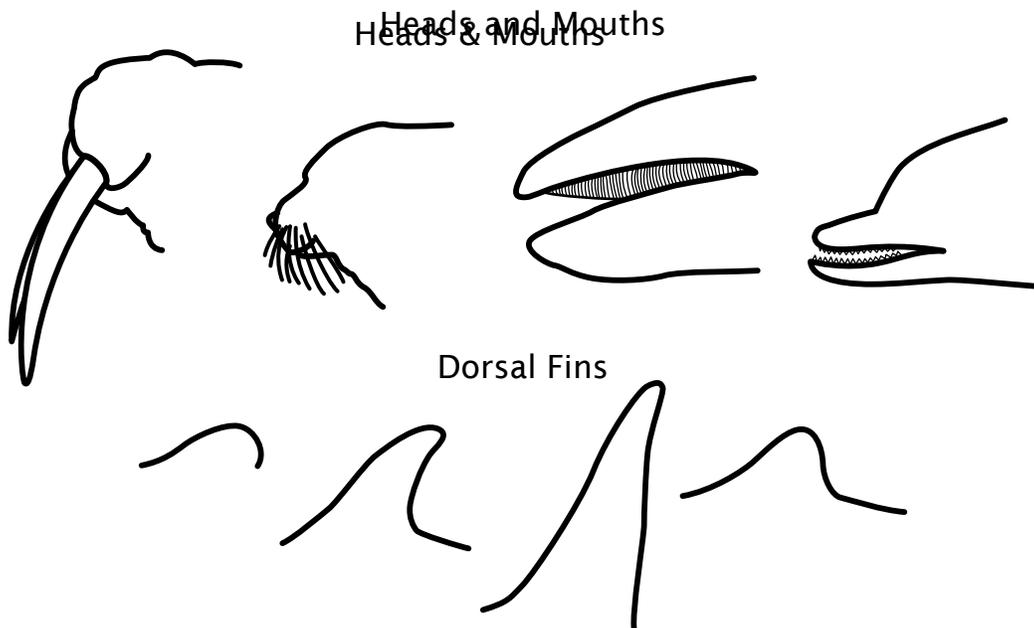
All of the brief portraits of sleeping marine mammals in this book are accurate. Some marine mammals sleep for hours at a time, like sea otters. Others, like manatees, sleep for only a few minutes before rising to the surface to breathe. Some swim half-asleep, like orcas. Others bob in the water, with their heads above the surface. The more scientists study marine mammals, the more they discover about the animals' amazing adaptations to their watery environment.

## Make your own marine mammal

Copy or download the last page. Cut out each rectangle. Using the information below, decide what features your animal(s) will have and draw your choices onto the appropriate area. Staple the pages together along the spine and cut all four layers on the dotted line just up to the solid gray line (spine). Now you are ready to mix and match your animals!

Here are some things to think about when designing your marine mammals:

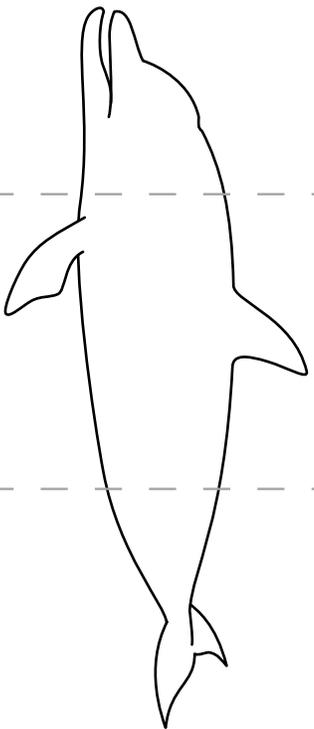
- Will your animal breathe through a nose or blowhole? Draw the nose or blowhole(s) on the head.
- Draw tusks, whiskers, or baleen if desired.
- Draw eyes on the head where you think they should go. Large eyes help animals to see in the dark water. Eyes closer to the top of the head are good for animals that like to float with their head above water. Eyes further down on the side of the head make it easier for animals with blowholes to see in the water when they come up for a breath.
- Some marine mammals (pinnipeds) use “whiskers” to find food. The walrus uses its tusks to dig for food in the sand. Draw whiskers or tusks if desired.
- Sea lions, fur seals, and sea otters have external ear flaps like us. Cetaceans “hear” by using echolocation (they send out a sound that bounces back to tell the cetacean where something is). How will your animal hear? Draw ears if desired.
- Will your animal live in warm or cold water? If it lives in cold water, how will it stay warm: fur or blubber? Blubber is a heavy layer of fat that helps to keep marine mammals warm in cold water. Draw fur onto the body if the animal has fur.
- Dorsal fins steady animals as they swim. Will your animals have a dorsal fin? Here are some kinds of dorsal fins that you can draw on the top of its back.
- Will your marine mammal be able to climb onto land? If so, will they have claws on their front flippers? Draw onto the animal.



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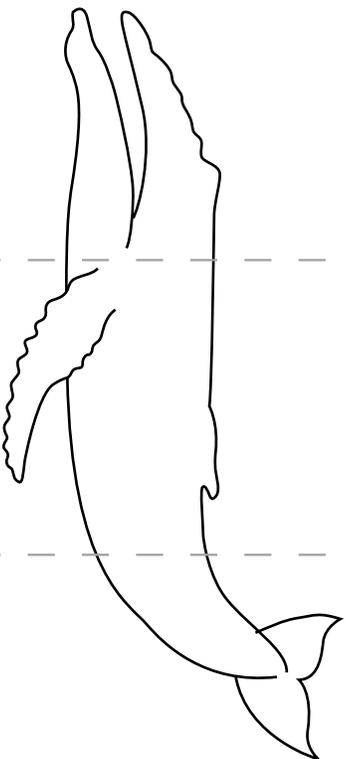
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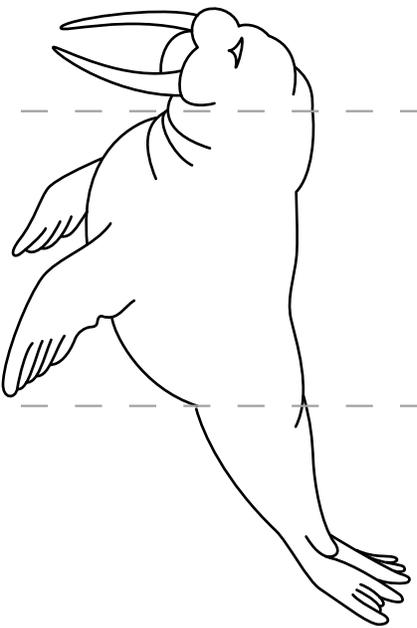
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