

Exercise 16  
MARINE MAMMALS  
AT SEA WORLD

Name \_\_\_\_\_

Section \_\_\_\_\_

Sea otters, pinnipeds and whales are marine vertebrates that evolved from terrestrial mammals several million years ago. Whale fossils, for example are found in deposits dating approximately 60 million years of age.

The sea otter belongs to the mammalian order Carnivora that includes the weasels and skunks. The pinnipeds include seals, sea lions and the walrus. The whales belong to the mammalian order Cetacea. The whales include both the large baleen whales such as the blue whale and smaller tooth mammals such as dolphins.

**CALIFORNIA SEA OTTER**

The carnivorous sea otter (*Enhydra lutris*) attains a length of about four feet. The male is slightly larger and may weigh up to 100 pounds. This species formerly ranged from Japan to Alaska, and south along the Californian coast to Baja California. It is now restricted to scattered localities within this former range. In California, it is primarily restricted to the Monterey County coastline, officially from Cambria to Monterey.



Breeding and birth will occur throughout the year. One pup will be born every few years. It will nurse for about one year and attains its mature growth in about four years.

The extremely valuable fur of the sea otter was sought by fur traders for over two centuries. This species was finally protected from probable extinction by the Fur Seal Treaty of 1911.

Describe the front and hind feet of the sea otter and how they are modified for feeding and swimming.

Front legs \_\_\_\_\_

Hind legs \_\_\_\_\_

The tail of the sea otter is unusually long for a marine mammal. Describe its shape and how the otter uses it.

Shape of tail \_\_\_\_\_

Use of tail \_\_\_\_\_

How do the sea otters related to each other? Are they solitary or social animals? \_\_\_\_\_

What observations lead you to this conclusion?

\_\_\_\_\_

### Polar Bear

The largest and most carnivorous of the bears. Males Polar Bears can grow up to nine feet long and weigh up to 1,600 lbs. Coat consists of hollow hairs, white in color with a yellowish tinge. Long neck and head, large "roman" nose and hairy pads characterize the polar bear. An excellent diver and swimmer, the polar bear has been seen 200 miles away from the nearest ice flow.



Polar Bear

How does the Polar swim? \_\_\_\_\_

\_\_\_\_\_

What are the swimming adaptations of the bear's head?

\_\_\_\_\_

Most bears of the Northern polar latitudes hibernate. How does the Polar Bear manage to survive when other bears cannot?

\_\_\_\_\_

\_\_\_\_\_

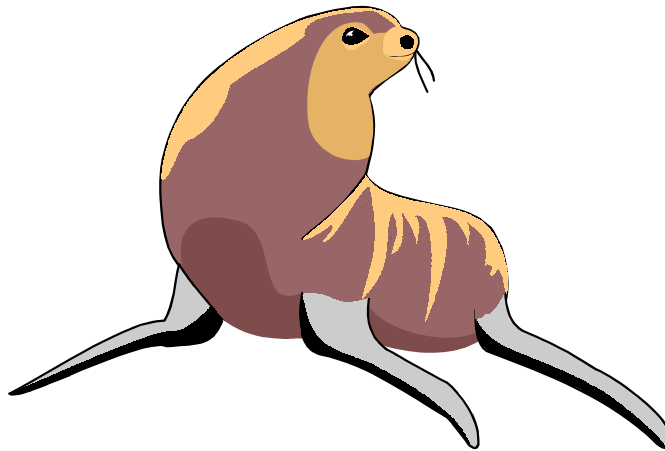
## PINNIPEDS

The pinnipeds may be divided into three families: the Otariidae the walking seals, the Phocidae the crawling seals and the Odobenidae the walrus.

Examine the flippers of a seal or sea lion. How do the appendages of a pinniped differ from the legs of a terrestrial mammal (position and appearance)?

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Compare the external anatomy of a pinniped with that of a whale such as a dolphin by completing the following table.

Group	Nostril Position On Head	Type of Tail	Limb Attachment Position on Body
Seals, Sea lion			
Dolphin			

Notice that the pinnipeds have less hair than the sea otter. What other means of insulation could the pinnipeds have that the otters lack?

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Rookeries for pinnipeds are usually on offshore islands. The adults return to these sites every year for breeding. Often the bulls will form harems of cows in a territory that they will

defend from other males. The presence or absence of a harem, harem size, extent of territory, and defense behavior will vary according to the species.

What is the adaptive advantage of the formation of harems or territories in pinnipeds?

\_\_\_\_\_

What time of year are the pups usually born? \_\_\_\_\_

Are the pups born on shore or in the water? \_\_\_\_\_

What is the average gestation period for a pinniped? \_\_\_\_\_

A female will successfully raise how many pups? \_\_\_\_\_

### CALIFORNIA SEA LION

The California Sea Lion ranges widely along the Pacific Coast. The males are larger than the females and attain a length of eight feet. The males usually weigh about 600 pounds, the females about 200 pounds.



The sea lion diet consists of fishes, squid and octopuses. Remains of over 24 species of fishes have been removed from stomach samples. Most of these species of fishes consumed were of no commercial value.

Compare the California male Sea Lions with the California female Sea Lions in the following table.

Sex	Body Color	Sagittal Crest?	Behavior
Male			
Female			

**HARBOR SEAL**

This species ranges widely through the northern hemisphere and is frequently seen in bays and harbors. The male is slightly larger than the female obtaining a length of six feet and a weight of 250 pounds. The harbor seal does not form harems.

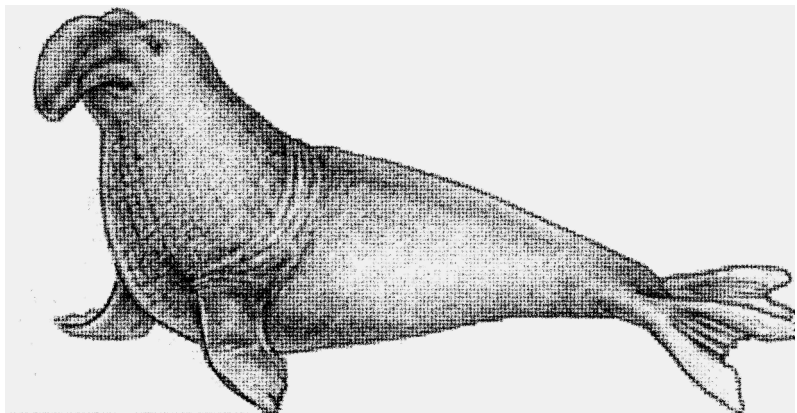


Compare the Harbor Seal with the California Sea Lion in the following table.

Pinniped	Coat Pattern	Ear Pinna	Fore flipper Length	Hind Flipper Orientation
Harbor Seal				
California Sea Lion				

**NORTHERN ELEPHANT SEAL**

Although an infrequent visitor to the mainland, the Northern Elephant seal is increasing in population size; hauling out on secluded California beaches has been observed. These true seals have reestablished a breeding population on the Coronado Islands and on the channel islands off Central California.



The elephant seals are the largest of pinnipeds and the males may reach a weight of over 8,000

pounds.

Unlike other members of the Phocidae, these animals show strong sexual dimorphism, with the male being several times larger than the female.

What is the function of the large snout of the male elephant seal?

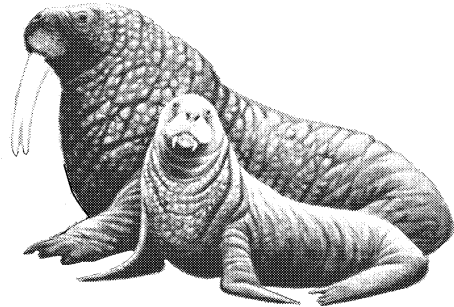
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Often, we may only see young elephant seals at Sea World during the winter months at Sea World. Why?

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## WALRUS

There are two subspecies of walrus, the Pacific and the Atlantic. Both species inhabit the moving pack ice and rocky islands of the Arctic. The males are larger than the females and both sexes have tusks. Feeding and mating of walruses have never been observed in the wild and various accounts may be suspect. One account suggests that the walrus uses its tusks to dig clams out of the soft mud, crushing the shell between their massive jaws and then spitting out the crushed shell fragments. Other accounts suggest that their stiff vibrissae are used to scrape up food and that the tusks are used only for pulling themselves up on the ice floes.



Walruses are still hunted today for their meat, blubber and ivory, and their total numbers are declining.

What do the walruses use for swimming, the pectoral flippers, the hind flippers or both?

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How does the walrus compare in size (body mass or weight) to the Stellar Sea lion?

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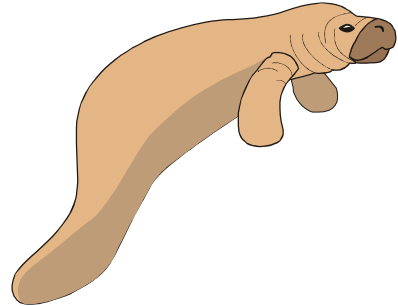
What sexual differences can be seen between the male and female walruses?

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## SIRENIA

### Florida Manatee

The order Sirenia contains two families of animals the Manatees and the Dugongs. This strange order is related to elephants. Their skeleton shows strong elephant-like characteristics and the Dugong even has short tusks. They are all vegetarians with molar-form teeth. The Manatee is represented by three species.



What is the distinguishing characteristic that separates the Manatees from the Dugongs?

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What does the Manatee feed upon? \_\_\_\_\_

What is the weight and length of the Florida Manatee? \_\_\_\_\_

## CETACEANS

The cetaceans vary in adult length from approximately six to 100 feet and may attain a weight of approximately 100 tons. Cetaceans generally swim freely, but speeds of 30 miles per hour have been recorded.

The external anatomy of cetaceans differs greatly from the external anatomy of a terrestrial mammal.

Compare a typical terrestrial mammal with a dolphin and complete the following table.

Type of Mammal	Nostril Position on Head	Type of Supporting Limb	Type of Tail
Cetacean			
Terrestrial Mammal (Dog)			

There are two blowholes or nostril openings in baleen whales and \_\_\_\_\_ in terrestrial mammals.

How many blowholes in the dolphin (typical of toothed whales)?

\_\_\_\_\_

What is the difference of movement of the tail of a cetacean compared to the tail movement of a fish?

\_\_\_\_\_

How is the nostril position in whales adaptive in a watery environment?

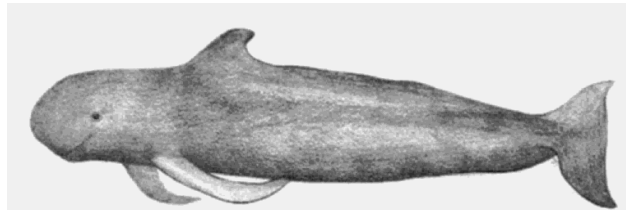
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With the almost complete lack of insulating hair, how are cetaceans protected from the cold temperature of the ocean?

\_\_\_\_\_

## PACIFIC PILOT WHALE

This toothed cetacean attains a length of 22 feet. Note the rounded and elongate flippers that are characteristics of this species. The pilot whale is usually black in color with some lighter markings behind the dorsal fin.

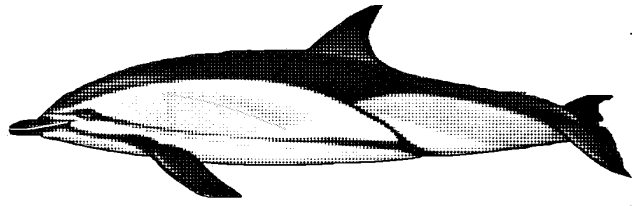


The whale is social and found traveling in large pods and often noted for stranding themselves in large numbers along the sandy shores.



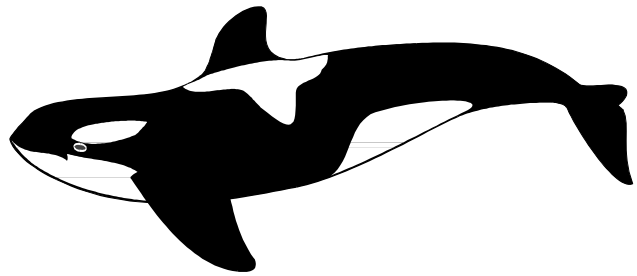
## COMMON DOLPHIN

The Common Dolphin resembles the Bottle Nose Dolphin except that it is more brightly colored, less husky and has a longer snout. There is a tan patch beginning a complex pattern of stripes and patches along its flanks. This dolphin reaches a length of eight feet is seldom seen in captivity.



## KILLER WHALE

The killer whale or orca, attains a length of about 30 feet and a weight of over 8000 pounds. This blunt nose predator feeds upon a variety of vertebrate prey such as fishes, seals,



How can a male killer whale be distinguished from a female killer whale?

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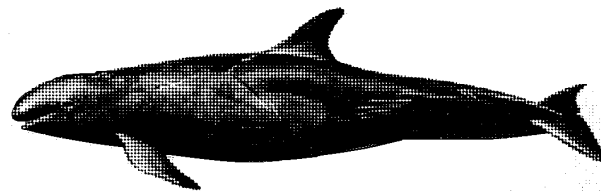
What are some names and wild functions of the show behaviors demonstrated by the killer whales?

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## FALSE KILLER WHALE

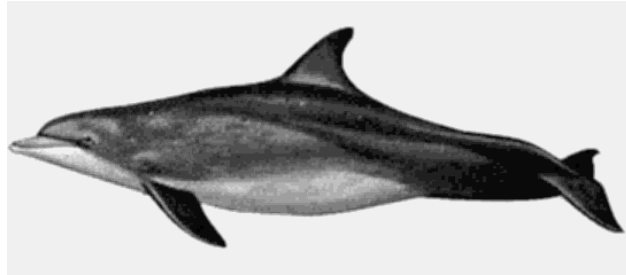
The false killer whale is slightly smaller (up to 18 feet) than the killer whale. The false killer whale has a rounded snout (somewhat flattened) a



small dorsal fin, narrow flippers, and lack the disruptive color pattern of orca.

### **BOTTLE NOSE DOLPHIN**

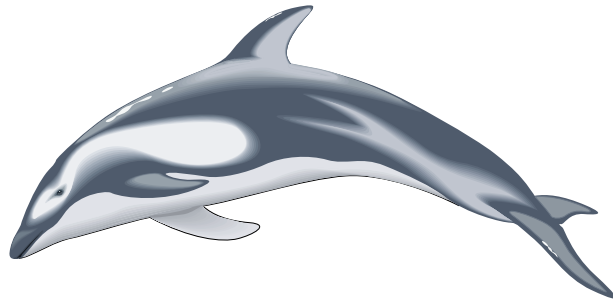
This whale is an inshore coastal species inhabiting the warm temperate waters and often coming into shallow lagoons, bays and inlets. The medium sized dolphins grow to about 12 feet in length and can weigh between 500 and 1000 pounds. It is commonly on display in oceanaria and used in their shows.



### **PACIFIC WHITE SIDED DOLPHIN**

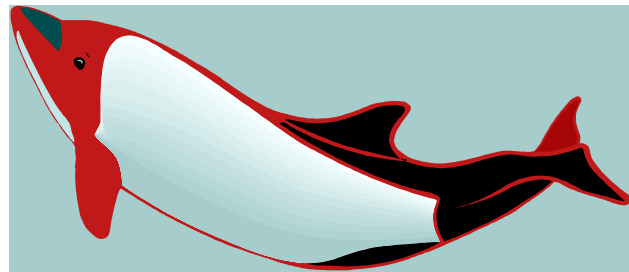
This species of dolphin has light to dark stripes that are visible on either side of the back. It has a distinctive white crescent shape on the dorsal fin.

These whales are found in offshore waters along the Pacific coast, from the tip of Baja California to Alaska often traveling with the common dolphin in large combined herds.



### **COMMERSON'S DOLPHIN**

The austral species of dolphin is amongst the smallest (5 and half feet) of the dolphin family. They lack the beak typical of many dolphins. The body is strongly marked with a rounded dorsal fin. This species is restricted to the Southern Oceans and is commonly sighted off the coasts of South America.



Some research is going on to study how they echolocate and perhaps explain why they swim upside down.

Compare the following dolphins in the table below. (Sketches of the fins are OK)

Whale Species	Body Size	Size of the Dorsal Fin	Shape of the Flipper	Shape of the Head
Pilot Whale				
Killer Whale				
False Killer				
Bottle-nose Dolphin				
White-Sided Dolphin				
Commerson Dolphin				
Common Dolphin				