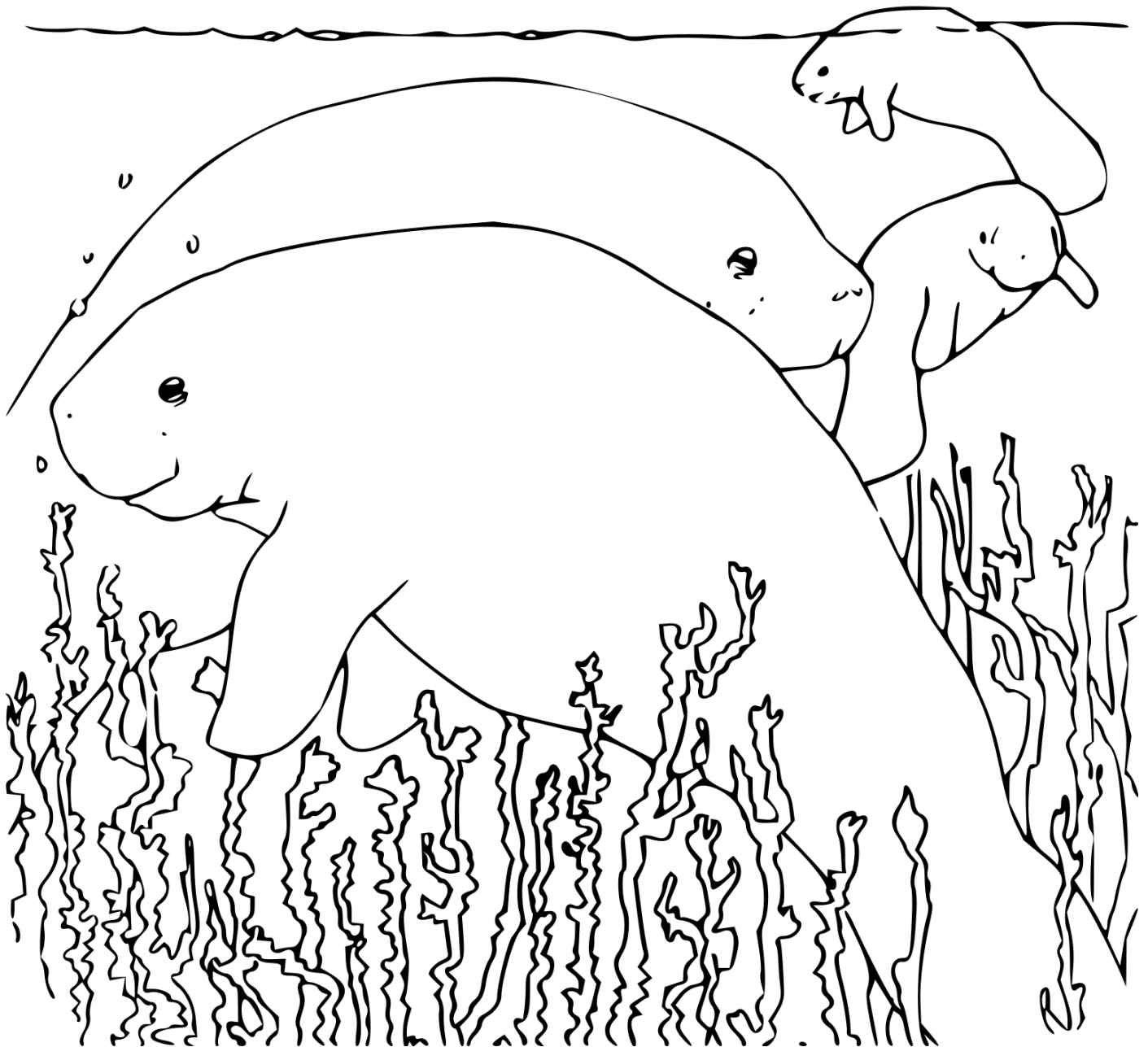


# MANATEE LAPBOOK



# Manatee Research and Lessons

research by Cate Proudfoot

mini-books by Ami

## Classification

Kingdom- Animalia (animals)

Phylum - Chordata

Subphylum- Vertebrata (with backbones)

Class- Mammalia (mammals)

Order- Sirenia

Family- Trichechidae

Genus and Species-

Trichechus manatus (West Indian manatee)

Trichechus senegalensis (West African manatee)

Trichechus inunguis (Amazonian manatee)

Family- Dugongidae

Genus and Species -

Dugong dugon (dugong)

Hydrodamalis gigas (Steller's sea cow)

## Vocabulary

mammal- any of a class of warm-blooded vertebrates that include humans and all other animals that nourish their young with milk; mammals also have hair

snout- nose

estuaries- area where a river flows into the ocean

blubber- thick layer of fat located under the skin

herbivore- plant eater

molars- tooth with a flat surface used for grinding

mangrove- trees and shrubs that grow in salt water habitats in tropical climates

## Mapping Manatees

West African manatees (*Trichechus senegalensis*) are found in the coastal water and rivers of western Africa.

West Indian manatees (*Trichechus manatus*) are the most commonly described manatee. They live in the coastal waters and estuaries of the southern United States (mainly Florida), the Caribbean Islands, eastern Central America and Brazil. If

water in the estuaries becomes too cold, manatees will move inland to canals and rivers. They rarely venture into water below 68 degrees Fahrenheit.

Amazonian manatees (*Trichechus inunguis*) are found in the Amazon River. Unlike West Indian and West African manatees, Amazonian manatees only live in fresh water and do not have nails on their flippers.

### Salt Water vs. Fresh Water

Manatees can live in salt water or fresh water! However, they drink only fresh water. If they are in salt water for extended periods of time, they must find a source of fresh drinking water. Swimming inland to rivers or canals can be one way to find fresh water. Siphoning fresh water that is floating on salt water, like water from rain, is another way they find a drink.

To demonstrate this concept try an experiment.

Gather 1 large glass, salt, food coloring and a medicine dropper.

Pour 8 ounces of tap water into the glass.

Mix 8 tablespoons of salt in the glass of water.

In a separate glass, mix water and food coloring. This will be the fresh water, like rain.

Using a medicine dropper, slowly drop the colored water on top of the salt water. Have your student record the results.

Salt water is denser than fresh water, so the colored (fresh) water should remain on the surface of the salt water.

### Manatee Characteristics & Anatomy

Manatees are harmless, semi social mammals.

Their bulky, seal-shaped body is nearly hairless except for the stiff bristles that dot the large square snout. Manatees have a thick, wrinkled, grayish brown hide that is often covered with bits of algae.

They have a powerful paddle-shaped tail that looks like an enormous beaver's tail.

Moving their tail with broad up and down strokes allows for graceful swimming.

Barrel rolls, banking turns and other moves are achieved by curling or twisting their tail.

Front flippers are used to steer or even "crawl" through shallow water. At the end

of each flipper are three or four fingernails. Fingernails are a very unique feature in underwater mammals. Flippers also come in handy when gathering food into their mouth. Manatee mothers use flippers to hold their babies close.

Adult manatees grow 10-12 feet long and weigh 1,200 - 2,200 pounds. Females typically are larger than males. The longest ever recorded was almost 14 feet long and the heaviest was over 3,500 pounds.

Manatees have excellent hearing. They hear from tiny holes just behind their eyes. (Some scientist believe they do not hear from the tiny holes but rather an area near their large cheekbones. Research is still being conducted to determine which is correct.) Sound travels faster (around six times) under water than it does in the air. Hearing sounds are very important for a mother and her calf to stay together in murky water.

#### What Manatees Eat

Manatees feed on a wide variety of sea grasses, mangrove leaves and freshwater vegetation, including fruits and nuts that have fallen in the water. Manatees only eat fish, crabs or other small animals if they accidentally get mixed in with plants they are eating. They do not prey on other living creatures and are considered herbivores.

An average size manatee needs to eat over 100 pounds of vegetation a day, the equivalent of over 200 heads of lettuce. It takes six to eight hours of eating each day to satisfy their appetite.

#### How Manatees Eat

The upper lip is split in two separate halves, moving independently of each other. Closing their upper lip like pliers makes picking up vegetation easy. The lips have several rows of bristles called vibrissae. The bristles can retract and extend, creating a conveyor belt like motion to guide food toward the mouth. Two front flippers also help to hold plants and guide them to their mouth.

Manatees chew lots of sand and grit mixed in with the plants. When their big grinding molars wear out from all that chewing, they move to the front of the mouth. Eventually, they fall out and are replaced by new ones. The teeth have no

roots anchored to the jawbone, which allows for "marching molars". Scientist believe up to 60 new teeth will grow in an average lifetime.

### Predators

Manatees have no natural predators. Some scientist believe sharks and alligators may attack manatees, but there is no proof of such attacks. They are completely defenseless. Their only way to avoid danger is to swim away.

Humans are the biggest threat to manatees. Hunting was responsible for the deaths of large numbers of manatees. The meat was considered a delicacy and the blubber was boiled down to make oil. By 1893, hunting had taken such a toll on the population that Florida declared the species "protected". Illegal hunting continued during the Depression until World War II. Strict rules are now enforced to stop hunting.

Harassment by divers, tourist and fishermen continue to put manatees in harm's way. Chasing, touching, riding and feeding manatees cause them to leave their warm habitat and move to colder, more dangerous water.

Studies show that collisions with boats (motorboats, tugboats and jet skis) account for one quarter of all manatee deaths. Many manatees in Florida can be identified by the unique scar patterns caused by boat propellers.

### Baby Manatees

Baby manatees are called calves. Adult females are called cows and adult males are bulls. They are dark gray-brown at birth and lighten as they grow. Calves are 3 - 4 feet long and weigh 50 - 70 pounds. They nurse underwater.

Mother manatees are highly protective and keep calves close by for about two years. Touching is an essential form of communication between mother and calf. Like human mothers, manatees show affection by playing, holding flippers and giving gentle kisses.

Females start producing young around seven years old. Then she gives birth to one calf every 2 - 5 years. (This low reproduction rate does not equal the rate at which manatees die or are killed)

### Communication

Sounds, like chirps and clicks, are used to show fear, stress or excitement. These sounds can be heard by humans.

Communication is especially strong between mother and calf. Spending much of their time in murky water makes it essential to communicate through sound.

### Extinction

All three species of manatee are listed by the World Conservation Union as vulnerable to extinction. (Please note that legislation is changing and may downgrade some species from endangered to threatened.) The U.S. Fish and Wildlife Service has listed manatees as an endangered species. It is illegal under federal Florida law (Florida Sanctuary Act) to injure or harm a manatee.

Steller's sea cow (*Hydrodamalis gigas*) was hunted to extinction in the 1770's.

### Steller's Sea Cows

The Steller's Sea cow was the only sirenian species (includes manatee and dugong) that lived in cold water. Larger than all other manatees, growing up to 30 feet long and weighing 4 tons. They were discovered by Russians exploring the Bering Strait and named after German explorer and scientist George Wilhelm Steller. Steller studied the sea cows while shipwrecked on this expedition. These explores hunted the sea cows for food and the animals actually saved the shipwrecked explorers' lives. After the explorers were rescued, news spread about the sea cows. Men hunted this "new" animal for food and profit. Steller's sea cow became extinct in less than thirty years after their discovery.

### Mermaids or Manatees?

Mermaids are legendary creatures with heads and bodies like a human and tails like a fish. Until the middle of the 19th century, many mariners referred to manatees and dugongs as mermaids. It has been implied that manatees and dugongs could be the basis for the legend of the mermaid.

Christopher Columbus wrote in his log that he had viewed mermaids on his journey to the new world, but had thought they would be more appealing. It is believed that the way a manatee holds their young looks so human-like that sailors thought they were part human. Original accounts of mermaids describe them as having green hair. This might be attributed to all the seaweed and plant material around a manatee when it surfaces to breath.

### Dugong

The difference is in the shape of the skull and tail. Dugongs have a forked tail, more

like a whale. The skin is thick and smooth and ranges from brown to dark grey. Dugongs, like Amazonian Manatees, lack nails on their flippers.

Dugongs are smaller than manatees, 8 to 9 feet long and weighing 500 to 700 pounds.

Another difference is in their mouth, incisors are present and molars do not continually grow back.

They are found from East Africa to Australia.

### Famous Manatee-- Snooty!

Snooty lives at the Parker Manatee Aquarium in Bradenton, Florida. He was the first manatee born in captivity. Born on July 21, 1948, he has also lived in captivity longer than any other manatee. The Parker Aquarium holds a birthday celebration each year to honor Snooty. He is also featured in the book *Florida's Famous Animals*.

Google for more information on Snooty.

### Library List

*A Manatee Calf Grows Up* by Katie Marsico

*Sea Cows Don't Moo!* by Susan Blackaby

*I'm a Manatee* by John Lithgow

*The Sea the Storm and the Mangrove Tangle* by Lynne Cherry

*Sam the Sea Cow* by Francine Jacobs (a Reading Rainbow selection)

**Directions:** You are looking at the inside of the book. Cut book out as one piece.  
Fold in thirds. Cut and paste cover on the front.

**What do manatees eat?**

**How much do they eat?**

**How long do they eat?**

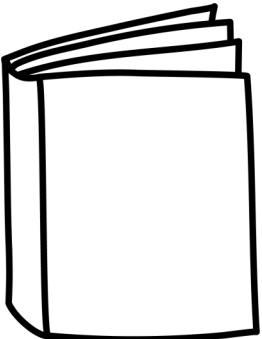


# **Manatee Meals**

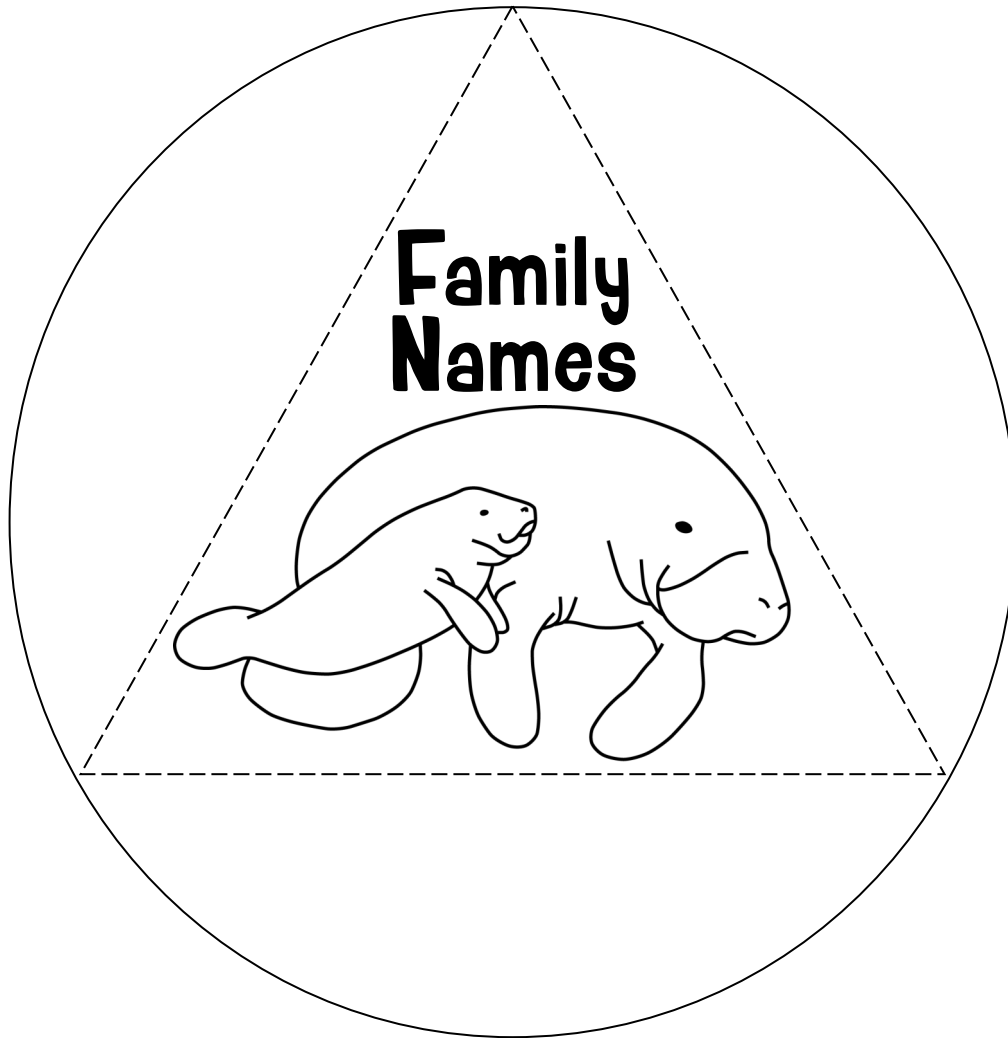




**Directions:** Cut each piece out on the solid black lines. There will be five pieces in all. Attach with brass fastener where indicated. If you need more than five pieces, print another page of templates.

	<b>Books I Read About Manatees</b>			

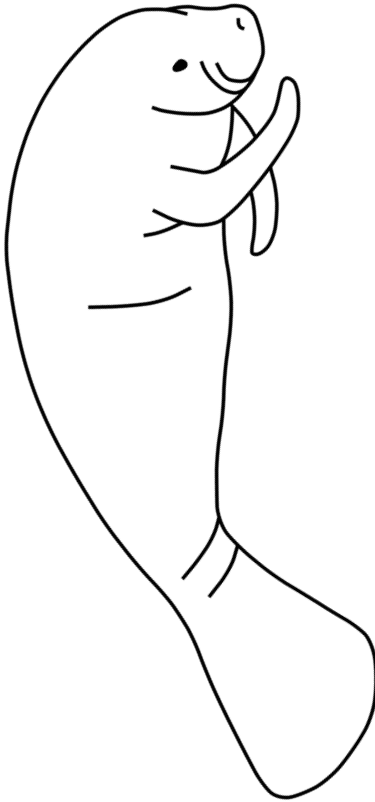
**Directions:** You are looking at the inside of the book. Cut out shape as one piece. Fold flaps in using the dotted lines as your guide. Tuck the last flap under so that book will stay closed. Write mother, father, and baby (one on each flap) along with their correct manatee names.



**Directions:** Cut out the three rectangles as ONE piece. Using the black line as your guide, fold the top rectangle down. Fold the left rectangle over (again, using the black line as your guide).

Under the flap, let your younger student write HUMANS (and possibly motor boats). Your older student can write as much information as he desires.

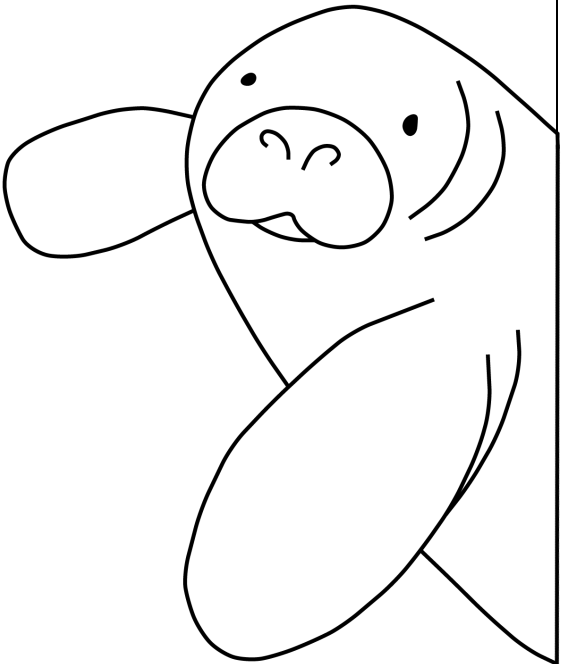
© Homeschool Share



**Danger! Danger!**

A manatee's  
biggest  
threats are...

# How Does a Manatee Munch on Lunch?



**Upper Lip**

**Flippers**

**Vibrissae**

**Directions:** Cut out pieces on previous page on the solid black lines. Cut information (or have your student write in his own words) and paste on to appropriate pages.

Stack book together with cover on front and staple on the left side.

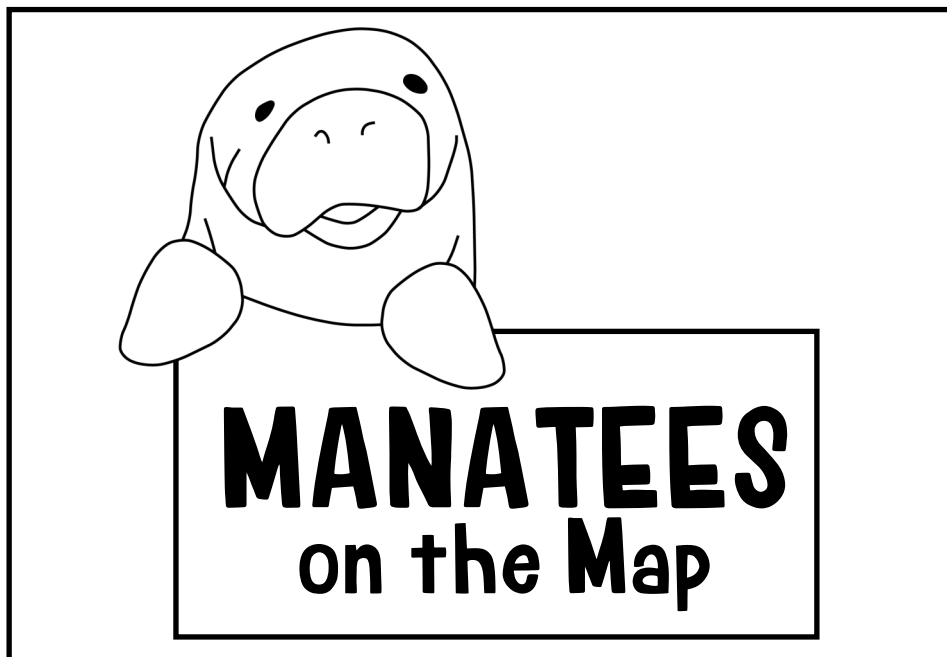
The lips have several rows of bristles called vibrissae.

The bristles can retract and extend, creating a conveyor belt like motion to guide food toward the mouth.

Two front flippers also help to hold plants and guide them to their mouth.

The upper lip is split in two separate halves, moving independently of each other. Closing their upper lip like pliers makes picking up vegetation easy.

Manatees on the Map Cover Piece (book on next page)



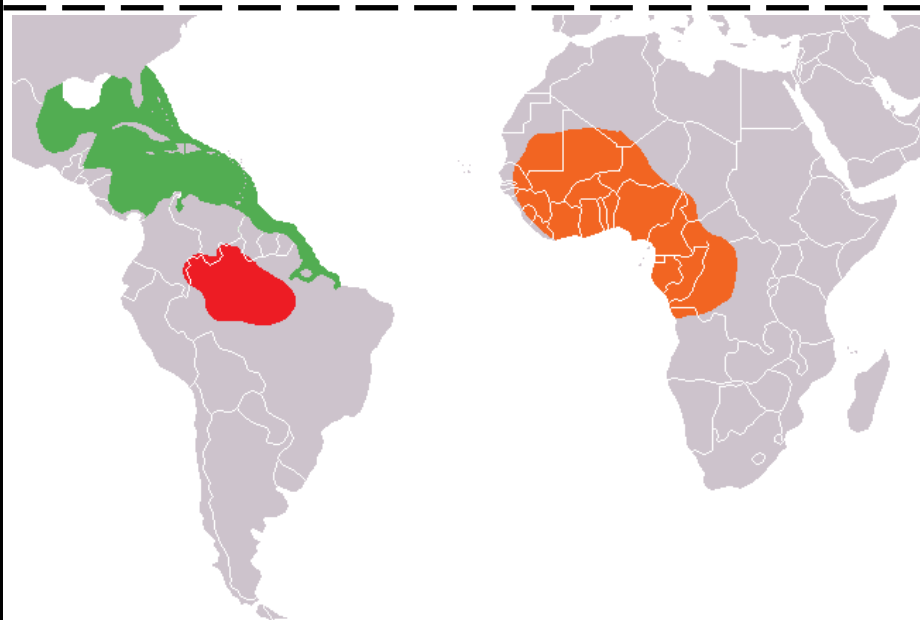
**Directions:** Cut out book as one piece. Fold in half. Cut out cover piece and paste it to the front of the book. (Cover piece is on the previous page.)

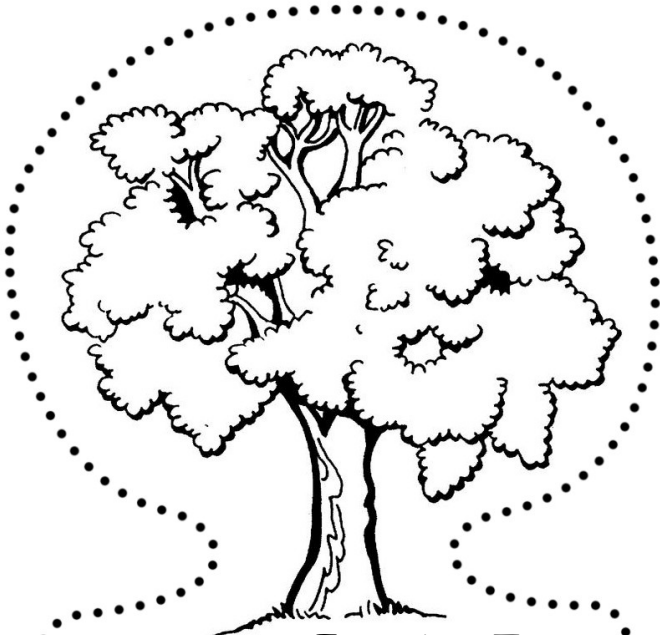
KEY

Orange =

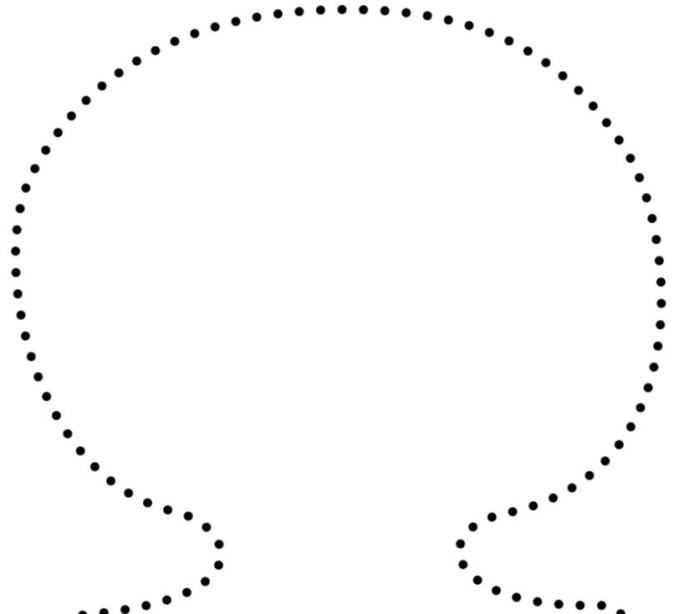
Red =

Green =

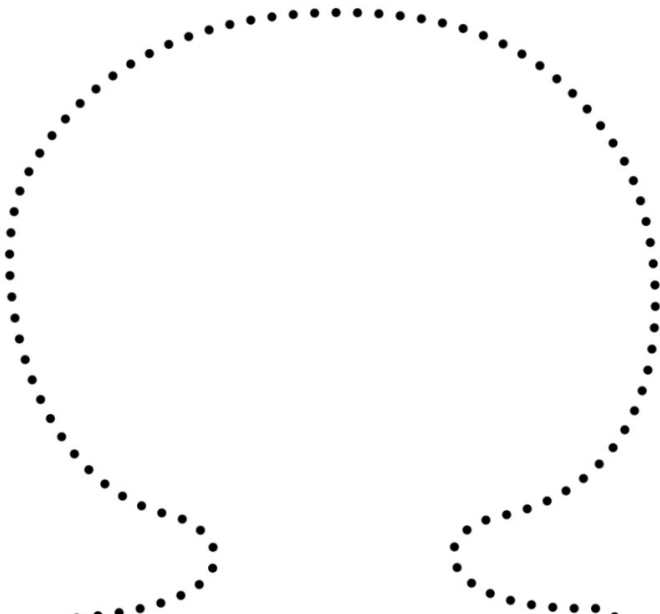




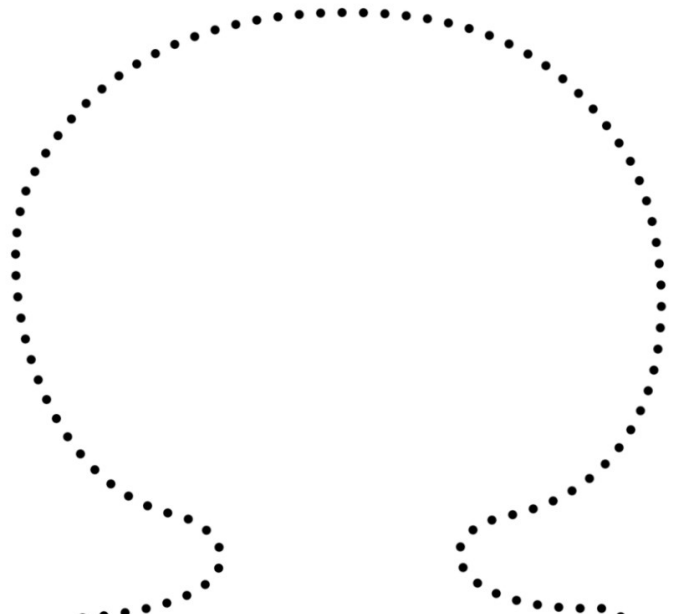
Manatee Family Tree



West Indian Manatee

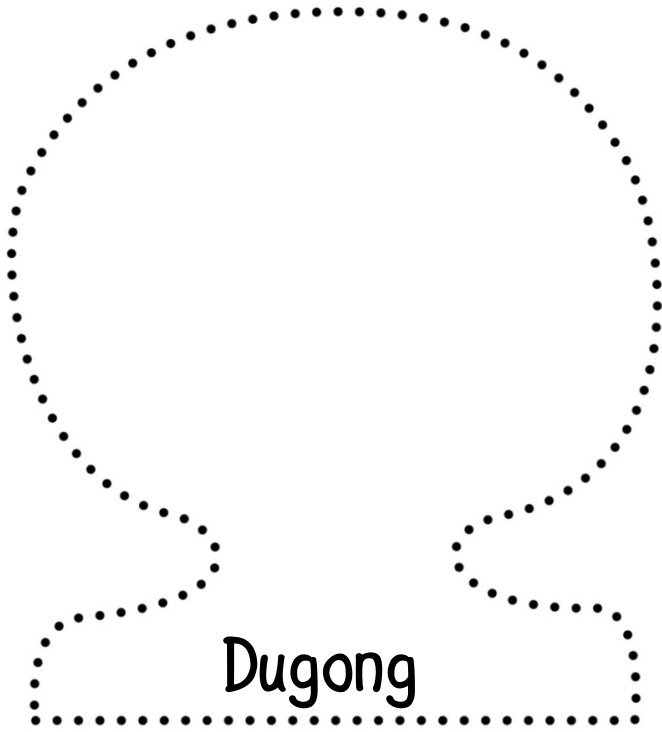


West African Manatee

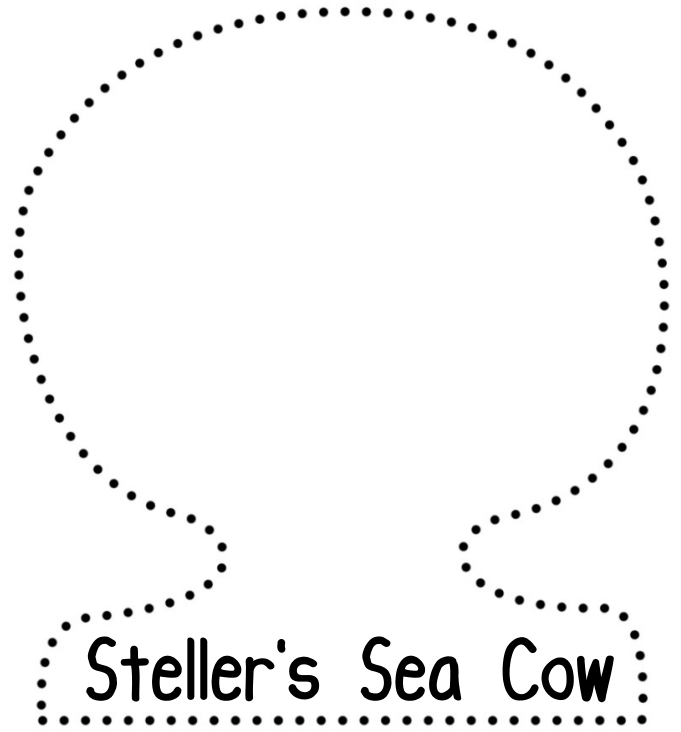


Amazonian Manatee

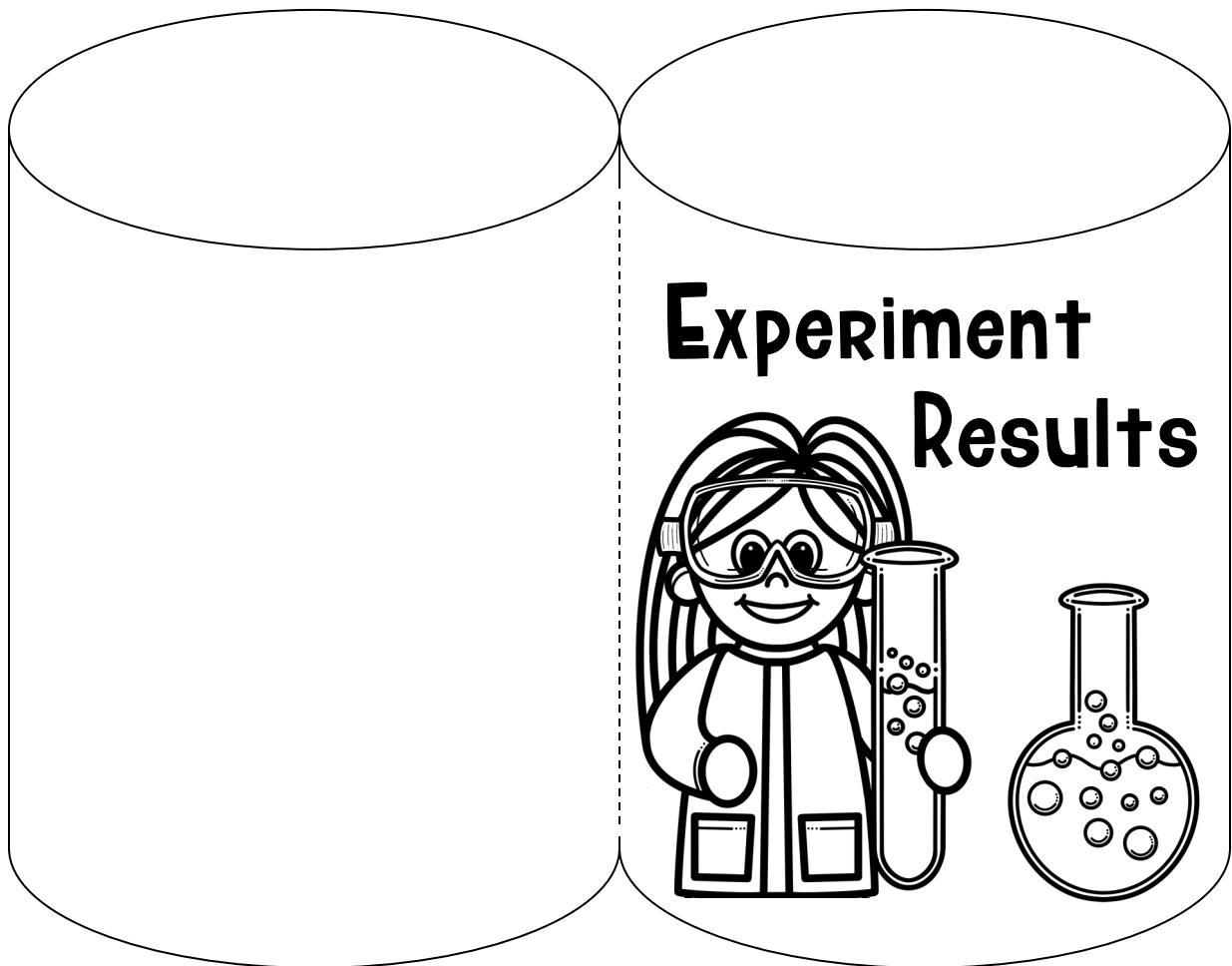
**Directions:** Cut out tree shapes. Search google images to find pictures of each "family member" and paste them on the pages. An older student may wish to write information in the blank spaces instead of pasting pictures. Secure trees with a staple.



Dugong

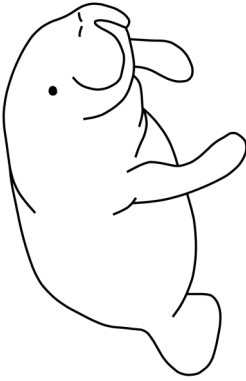

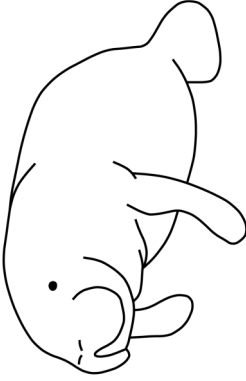
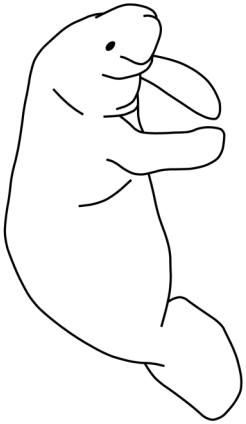


Steller's Sea Cow



**Directions:** Cut out book as one piece. Fold in half. Record experiment results/ what your student learned inside the book.



Fun Fact	Fun Fact	Fun Fact	Fun Fact
			

**Directions:** Cut on solid black lines. Fold books (four total) matchbook style. Let your student write one interesting fact about manatees in each book.

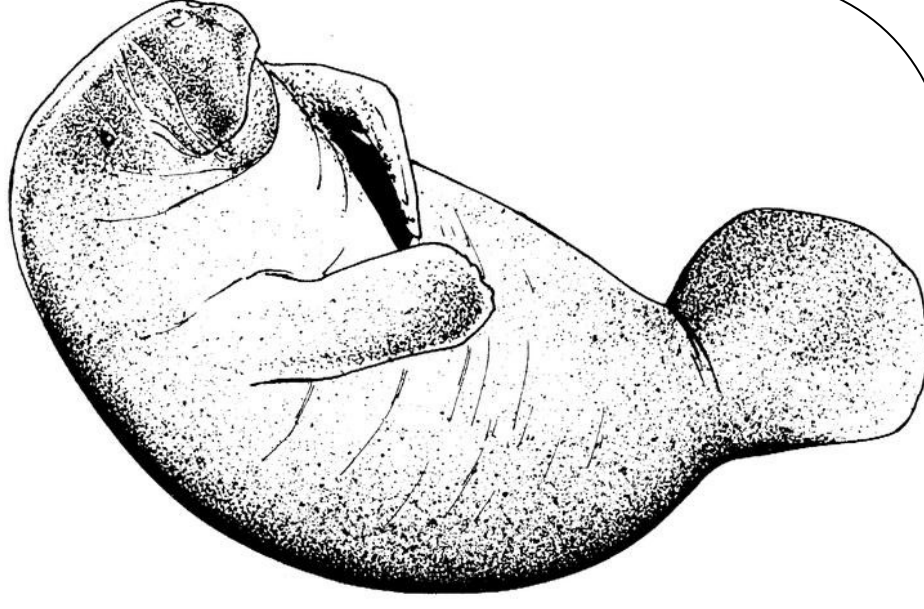
**Directions:** Cut book out as one piece. Fold accordion style. Glue back of last page to your lapbook.

What is another way a manatee finds a drink?

If a manatee is in salt water, it might swim to find some drinking water. Where will it swim to?

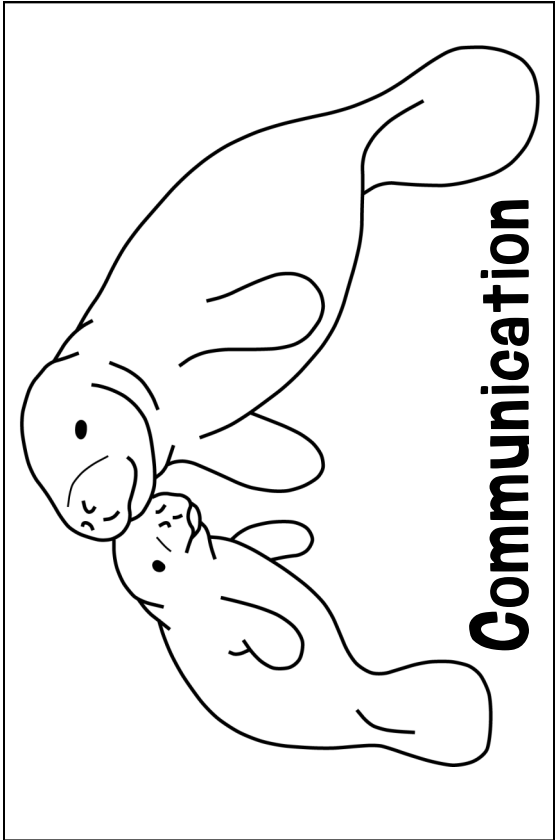
## Finding

## Freshwater



**Directions:** Cut L-shape out as ONE piece.  
Fold the top of the L shape down. Fold the  
right rectangle in over the existing flap.

<div data-bbox="479 1102 750 1417" data-label="Text"><p>What kinds of noises do manatees make?</p></div> <div data-bbox="441 1507 784 1879" data-label="Text"><p>What do these noises communicate to other manatees?</p></div>	
--	--



**Directions:** Cut out rectangle as one piece. Fold on solid lines. You should have a book that opens like the "shutters" on a window.

Under the mermaid flap, let your student write about what a mermaid is. Under the manatee flap, let your student write about why sailors thought they were mermaids.

<b>Manatees</b>	<b>Mermaids or</b>
	

**Directions:** Cut the strips along the solid outer lines. If there is a rectangle piece in the right corner of the strip, cut it off as indicated (remove this area). Stack your strips in order with cover on top and staple where indicated.



# Manatee Anatomy

Body Shape

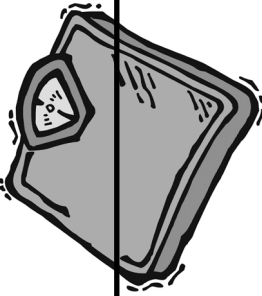
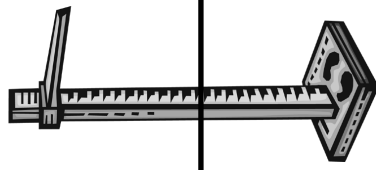
REMOVE THIS AREA (Cut away so you have just a tab left)

Flippers

REMOVE THIS AREA

		Tail
Skin	REMOVE THIS AREA	
	Hair	REMOVE

Directions: Cut book out as one piece. Fold left and right sides under so that they meet. Open book. Cut on solid black lines to form four flaps.

<b>A Manatee's Height</b>		<b>My Height</b>
		
<b>A Manatee's Weight</b>		<b>My Weight</b>

**Directions:** Cut out book as one piece. Fold left side in. Fold right side in. Open book. Cut on dotted lines to form six flaps. Refold book. Write correct vocabulary word under each flap.

any class of warm-blooded vertebrates that feed their young milk; they also have hair

an area where a river flows into the ocean

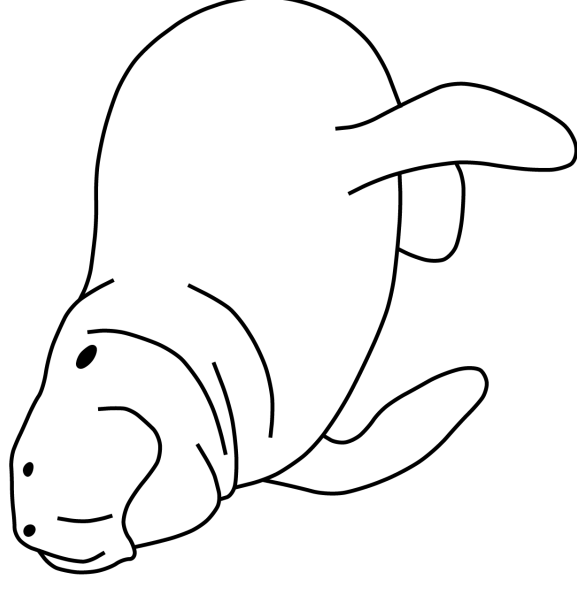
nose of an animal

thick layer of fat located under the skin

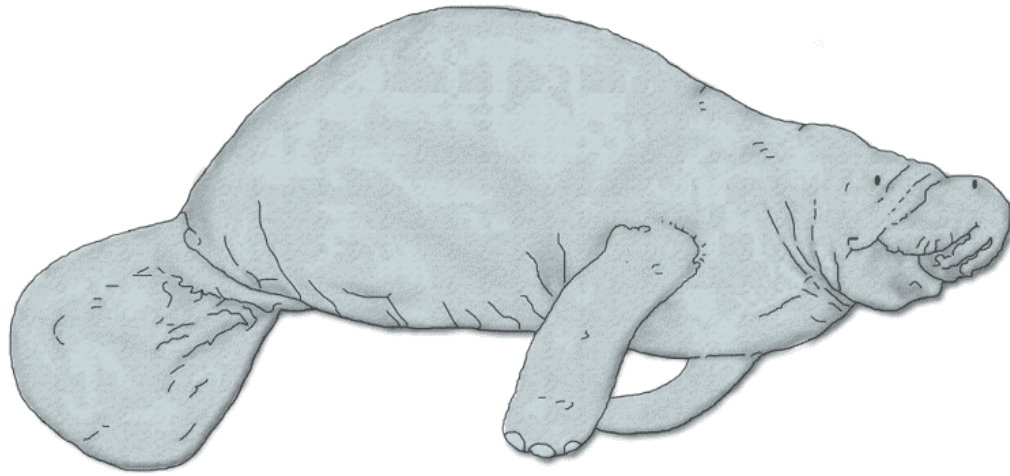
a tooth with a flat surface used for grinding

trees and shrubs that grow in salt water (in tropical climates)

# New Words







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