



Education Dept.
Georgia Aquarium
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Atlanta, GA 30313
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Aqua Adventure Teacher Guide Grades 3-5

Dear Educators,

We are happy you are visiting us here at the Georgia Aquarium and extending your classroom to include our salt water and fresh water habitats.

The following guide has been designed to make your day at the Aquarium engaging and fun for you and your students. We have divided it into five sections – *lesson overview, student guide based on the five galleries of the Aquarium, teacher guide, pre-visit activities, and post-visit activities.*

Extension of your classroom: As educators ourselves, we are excited to offer you this space as an extension of your own classroom. The following activities have been correlated to the third, fourth, and fifth grade Georgia Performance Standards. In just a morning or an afternoon you and your students can address the following objectives and GPS's:

Objectives:

- ◆ Students will classify organisms according to their physical characteristics.
- ◆ Students will explore the conservation status of various aquatic animals and learn what they can do to help protect them.
- ◆ Students will investigate the adaptations that allow an animal to survive successfully in its habitat.
- ◆ Students will understand the concept of symbiotic relationships and be aware of the interdependence of all organisms in an ecosystem.
- ◆ Students will know and discuss how humans play an important role in maintaining healthy marine and freshwater ecosystems.

Georgia Performance Standards Addressed:

3rd Grade

Characteristics of Science

S3CS4: Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Observe and describe how parts influence one another in things with many parts.
- b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world.

Content

S3L1: Students will investigate the habitats of different organisms and the dependence of organisms on their habitat.

- c. Identify features of animals that allow them to live and thrive in different regions of Georgia

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- d. Explain what will happen to an organism if the habitat is changed.
- S3L2: Students will recognize the effects of pollution and humans on the environment.
- a. Explain the effects of pollution (such as littering) to the habitats of plants and animals.
 - b. Identify ways to protect the environment.

- ELA3R2: The student acquires and uses grade-level words to communicate effectively.
- a. Read literary and informational text and incorporates new words into oral and written language.
 - f. Determines the meaning of unknown words on the basis of context.

- ELA3R3: The student uses a variety of strategies to gain meaning from grade-level text.
- l. The student identifies and infers cause-and-effect relationships and draws conclusions.

- ELA3LSV1: The student uses oral and visual strategies to communicate. The student
- b. Recalls, interprets, and summarizes information presented orally.
 - d. Listens to and views a variety of media to acquire information.

- M3N3: Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.
- g. solve problems using multiplication.

- M3N4: Students will understand the meaning of division and develop the ability to apply it in problem solving.

- c. Recognize problem solving situations in which division may be applied and write corresponding mathematical expressions.
- f. Solve problems requiring division.

- M3P1: Students will solve problems that arise in mathematics and in other context.

- a. Solve non routine word problems using the strategy of logical reasoning as well as all strategies learned in previous grades.
- b. Solve single and multi-step routine word problems related to all appropriate third grade math standards.
- c. Determine the operations(s) needed to solve the problem.
- d. Determine the most effective way to solve a problem.

4th Grade

Characteristics of Science

- S4CS4: Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Observe and describe how parts influence one another in things with many parts.
- b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world. Identify ways in which the representations do not match their original counterparts.

Content

- S4L1: Students will describe the roles of organisms and the flow of energy within an ecosystem.
- b. Demonstrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers.
 - c. Predict how changes in the environment would affect a community (ecosystem) of organisms.
 - d. Predict effects on a population if some of the plants or animals in the community are scarce or if there are too many.

S4L2: Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation), and external features (camouflage and protection).

- a. Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features.

ELA4R1: The student demonstrates comprehension and shows evidence of a warranted and responsible explanation of a variety of literary and informational texts.

- a. Locates facts that answer the reader's questions.
- c. Identifies and uses knowledge of common graphic features.
- g. Makes perceptive and well-developed connections.

ELA4R3: The student understands and acquires new vocabulary and uses it correctly in reading and writing.

- a. Reads a variety of texts and incorporates new words into oral and written language.
- b. Determines the meaning of unknown words using their context.

ELA4LSV1: The student participates in student-to-teacher, student-to-student, and group verbal interactions.

- e. Confirms understanding by paraphrasing the adult's directions or suggestions.
- f. Displays appropriate turn-taking behaviors.
- j. Volunteers contributions and responds when directly solicited by teacher or discussion leader.

M4N3: Students will solve problems involving multiplication of 2-3 digit numbers by 1-2 numbers.

M4M1: Students will understand the concept of weight and how to measure it.

- b. Know the units used to measure weight (gram, kilogram, ounces, pounds, tons)

M4P1: Students will solve problems that arise in mathematics and in other context.

- a. Solve non routine word problems using the strategy of logical reasoning as well as all strategies learned in previous grades.
- b. Solve single and multi-step routine word problems related to all appropriate fourth grade math standards.
- c. Determine the operations(s) needed to solve the problem.
- d. Determine the most effective way to solve a problem.

5th Grade

Characteristics of Science

S5CS4: Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Observe and describe how parts influence one another in things with many parts.
- b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world. Identify ways in which the representations do not match their original counterparts.

Content

S5L1: Students will classify organisms into groups and relate how they determined the groups with how and why scientists use classification.

- a. Demonstrate how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal).

ELA5R1: The student demonstrates comprehension and shows evidence of a warranted and responsible explanation of a variety of literary and informational texts.

- a. Locates facts that answer the reader's questions.

- c. Identifies and uses knowledge of common graphic features (e.g., charts, maps, diagrams, captions, and illustrations).
- d. Identifies and uses knowledge of common organizational structures (e.g., chronological order, logical order, cause and effect, classification schemes).
- g. Makes perceptive and well-developed connections.

ELA5R3: The student understands and acquires new vocabulary and uses it correctly in reading and writing.

- a. Reads a variety of texts and incorporates new words into oral and written language.
- b. Determines the meaning of unfamiliar words using context clues (e.g., definitions, example).

ELA5LSV1: The student participates in student-to-teacher, student-to-student and group verbal interactions.

- b. Asks relevant questions.
- e. Confirms understanding by paraphrasing the adult's directions or suggestions.
- f. Displays appropriate turn-taking behaviors.
- j. Volunteers contributions and responds when directly solicited by teacher or discussion leader.
- k. Gives reasons in support of opinions expressed.

M5P1: Students will solve problems that arise in mathematics and in other context.

- a. Solve non routine word problems using the strategy of logical reasoning as well as all strategies learned in previous grades.
- b. Solve single and multi-step routine word problems related to all appropriate fifth grade math standards.
- c. Determine the operations(s) needed to solve the problem.
- d. Determine the most effective way to solve a problem.

Overall Format: Each gallery has a few stops that we recommend you spend a little more time at with your students. Each stop is highlighted by an exhibit overview and then some guiding questions for the students (and answers for the adults). These questions are meant to help highlight key concepts for your group, whether it be observing an animal's behavior, or simply finding some of our favorite animals in the exhibit. Students will need to bring clipboards or another type of board, and writing utensils with them to complete the activities.

To help you use the space, there are small markers next to each stop to guide you on how we use these spaces every day with groups of all ages.



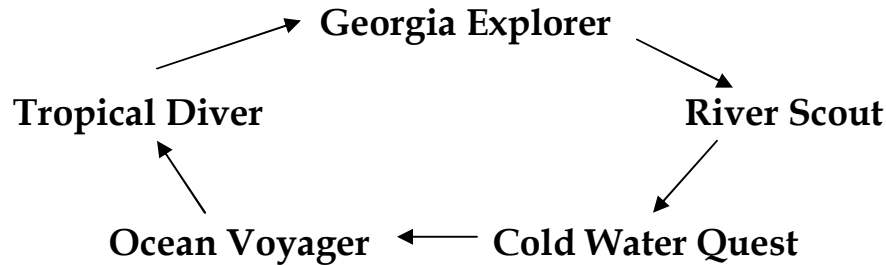
Whenever your group is in front of the larger gallery windows at the aquarium, we ask that students sit cross legged in a few rows close to the window. If all students sit on their bottoms and not on their knees, everyone in the group is able to see. We recommend rows of about 7 so that no group takes up more than about one third of a window at a time and everyone behind the group can see.



At our touch pools, students will have the opportunity to explore using their senses. For the safety of the animals, please make sure they are touching softly with two fingers and not grabbing. Some students might not be tall enough to reach all of the animals. Please make sure that you watch your students carefully for their safety as well as that of the animals.

👁️ Some things at the Aquarium are only seen when you are looking for them. These animals are always fun to try and find in the exhibit while playing a quick game of I-spy.

Your groups: While at the aquarium, the smaller the individual group the better. One chaperone with five to seven students is much easier to manage than two chaperones with twenty students. This allows everyone to see the exhibits as well as help with traffic in the galleries. We also recommend that your entire group does not start at the same gallery. Have them split up and start in different galleries and rotate. Here is our recommendation on how to rotate:



Considering that every gallery exits to the main atrium, it is easy to set up an end meeting point for all groups before exiting through the gift shop or eating. Make sure all the adults pick up a map when they enter the Aquarium to help guide them around the building.

Rules: Finally to ensure a great visit, we ask that you share the following rules with your students and chaperones for the safety of our animals and your students.

- No running
- Be respectful of the other guests
- No horseplay, pushing or shoving
- Use indoor voices
- No tapping on the windows – it can be very bothersome to our animals
- **Stay with your chaperones at all times**
- No chewing of gum
- Only touch with two fingers

We hope you have an amazing day here at the Georgia Aquarium, the world’s most engaging aquarium, and that the tips and tricks listed in this guide are useful in extending your classroom to the watery world. Please be sure to complete our *Teacher Survey* located at the end of the guide.

Best Fishes!


The Georgia Aquarium Education Department

Name: _____




Aqua Adventure
Student Guide
Grades 3rd - 5th

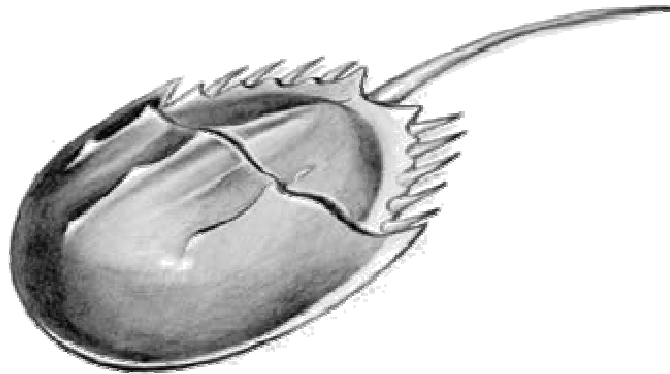
Welcome to the Georgia Explorer gallery! Here we will use our senses to discover more about the animals that share our home state with us. Get those two scientific fingers ready to explore and learn more about these animals!

 **VISIT the Shark and Ray touch pool!** To reach down, make sure you lie on your bellies on the rocks and touch the animals lightly on their backs. (use two fingers and touch gently; don't hold your paper over the water!) Name the three species found in this touch pool:

_____ rays _____ rays _____ sharks


DRAW a sketch of each animal here, identifying key features such as mouth, eyes, gills, spiracles, dorsal fin, pectoral fin, and tail fin .

 The **Horseshoe crab** touch pool exhibit is located in front of the Gray's Reef exhibit. LISTEN to the presentation or ask a Georgia Aquarium staff member to find out how many eyes the horseshoe crab has and draw arrows to the eyes on the drawing.



Where is the horseshoe crab's mouth? _____

What animals are they closely related to? _____

 **FIND the Loggerhead sea turtle!** Sometimes it likes to swim and sometimes it likes to nap under the rocks.

How does a sea turtle protect itself? _____


Name one thing about sea turtle's body that is different from a land turtle's body:

IDENTIFY two fish in the exhibit by using the computers by clicking the more fish button.

  VISIT the Right Whale Theater. Watch either video and answer the following questions:

- Why do **Northern right whales** migrate to the Georgia coast?

- It is estimated that there are only about 400 Northern right whales alive right now. What do we call a species that is in danger of becoming extinct?

 TAKE the stairs up to the second level. Locate the poster on the **Turtle Excluder Device (TED)** and read it. Answer the questions below.

- What does a TED do? _____
 - Who uses TEDs? _____
 - Why are TEDs important? _____
-

SLIDE down the whale slide to the first floor! Watch the sea turtle video (located near the whale's mouth in the corner) and answer these questions.

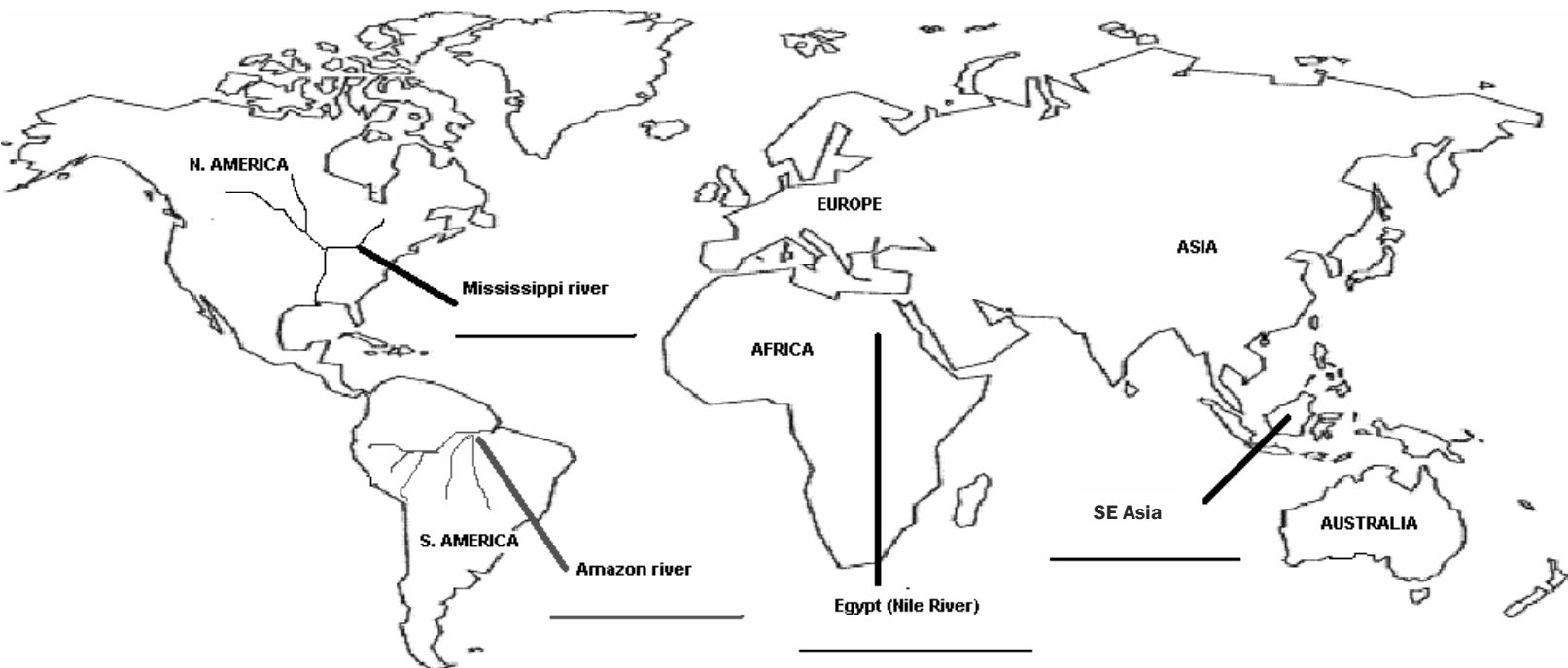
Where do the hatchlings or baby sea turtles go when they hatch? _____

What do sea turtles eat? _____

What do sea turtles have in common with the northern right whale? _____



Rivers and lakes are a huge part of our lives! Wherever you go you will find freshwater habitats all over the world. They are important to us and all the many different animals that live there! Let's go discover just how different all these animals can be! As you go through the gallery, fill in the blanks on the world map with the name of some animals that might live in those areas:




👁️ Crawl through the tunnel under the river! The river above your heads is a North American river that has many different kinds of fish. Look at all the different kinds of mouths these animals have! While in the tunnel, peek through the bubble window and find a fish with a blue dot on its gills that is a Bluegill fish.

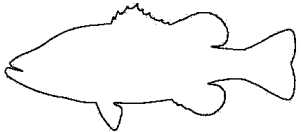

Next, stop by the alligator exhibit and check out these reptiles. In the wild, alligators are “sit and wait” or ambush predators, meaning they wait for their food to swim by and then reach out and grab it. Where do you think alligators are on the food chain? Top or bottom?


Take a good look at the alligators, what part of their bodies is above water?

Are alligators air or water breathers? _____

Do you know why alligators don't eat the turtles in the exhibit? It's because we feed them so well they don't need to snack, just like with the sharks! See if you can find and identify one of the freshwater turtles.

 **LOOK and COMPARE** the Striped bass in the river above the Alligator exhibit to the American alligator. Observe the animals for a few minutes and complete chart below. Once finished determine the classification of these animals (mammal, fish, reptile, bird, amphibian, ect.) based on the characteristics listed below. List them in the blanks.

Striped Bass	Characteristic	Alligator
	Covering	
	How does it breath?	
	Movement	
	Coloring/pattern	
	Habitat (water, land, land & water)	
	Vertebrate or invertebrate	
	Cold or Warm blooded	
	Body parts	
	What type of animal?	

 **VISIT** the electric fish exhibits. All three of these animals have adapted to use electricity, though they may use it in different ways. What does each of these animals use electricity for?

Electric catfish: _____

Electric eel: _____

Elephantnose fish: _____

 **OBSERVE** the **Asian small-clawed otters** for a few minutes. What are they doing?

What makes Asian small-clawed otters different from all other otter species?

Name two human activities that impact the habitat of the Asian small-clawed otter:



Our first stop is in the **Kelp Forest Exhibit** at the entrance to the Cold Water gallery. This exhibit and the touch pool across the way show the fragile animals found in tide pools and kelp forests in the northwestern United States from California to Washington.

- The Garibaldi fish inspired the Aquarium mascot named _____
- Can you find the Senorita fish or the Horn shark? Where do they each live in a kelp forest? _____



Come sit by the Beluga whales and relax. Listen to the aquarium staff on the microphone as they will be sharing some great information about these amazing animals.

Where do Beluga whales live in the wild? _____

Which two Belugas are related in the exhibit? _____

How do the following adaptations help Belugas to survive?

Adaptation	Function
Dorsal Ridge	
Flexible Neck and Lips	
Thick Blubber	
Melon (vocalization)	
Blow Hole	

So far on your adventure you have seen many vertebrates such as fish, reptiles, and mammals, and a few invertebrates. What is the difference between a vertebrate and invertebrate? _____




Your next stop is our Giant Pacific Octopus! Can you find her in the exhibit? Be sure to watch the video to the left of the exhibit.

Is the Giant Pacific octopus a vertebrate or invertebrate? _____

What are octopuses related to? _____

Octopuses are considered masters of disguise. Why? _____

On your way to the Southern sea otter, check out how the Weedy sea dragons use their leafy appendages to help them hide. What is it called when an animal blends in with its surroundings? _____

 **VIEW** the **Southern sea otters**. Southern sea otters are different from other otters in that they spend most of their time in the water. How do they stay warm since they don't have blubber?

How do they keep from drifting away in the water?

DID YOU KNOW - Southern sea otters eat many types of prey including sea urchins, snails, mussels, crabs, scallops, fish, barnacles, octopus, worms and squid. They must eat 20 percent of their body weight every day to maintain their normal body temperature in this cold environment. So for our otters, Oz and Gracie they must consume approximately 12 pounds of food daily to stay warm.



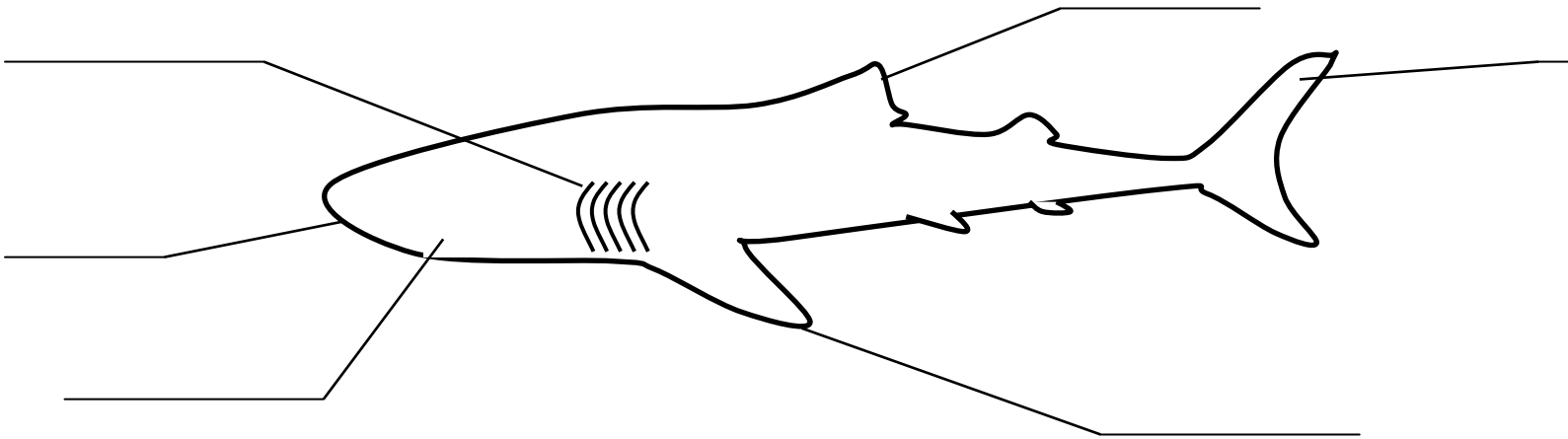
Welcome to the world ocean! We call it the world ocean because all of our oceans are part of one large ocean that covers the entire world allowing these animals to roam from one ocean to another. **The adults in the groups should pick up a dive identification card at the beginning of the gallery to help in identifying the animals.**



At the viewing theater of Ocean Voyager **OBSERVE** the **grouper, Whale shark,** and **Cownose stingray**. Note the following characteristics to discover similarities and differences.

Feature	Whale shark	grouper	Cownose stingray
Location of mouth			
Location of gills			
Number of gill slits/openings			
How does it move?			
Color/Patters?			

Label the **Whale shark** drawing below with the following parts: eyes, gill slit, dorsal fin, caudal or tail fin, pectoral fin, and mouth:



The grouper is considered an *ambush predator*, which means they sit and wait for their prey to swim by and grab it. What adaptation do they have to look for food?

Instead of teeth, stingrays have flat, hard *mouthplates* to crush their food. What do you think they eat? (HINT: look at where they are in the exhibit and where their mouth is located)

What do you think a whale shark eats? _____

Can you find another filter feeder? _____

FOOD CHAIN - Based on what you have learned and seen so far in the Ocean Voyager and Cold Water Quest galleries, draw a food chain one might find in the ocean with arrow to show what eats what.

For example: Sunlight (*producer*) ← phytoplankton (algae) ← zooplankton like krill and copepods ← whale shark (*consumer*)


Be sure to label the producer and consumers.

If you took one of the animals out of the food chain, how would that affect the whole ecosystem?

Be sure to return your Species Identification Card to the Box at the exit!

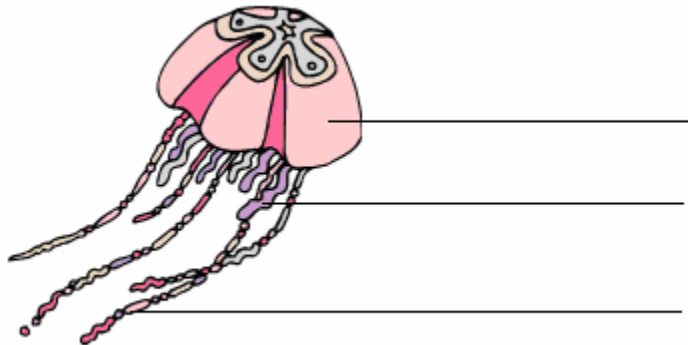


Welcome to the peaceful waters of the warm tropical ocean that surround the equator. Here we will find the wildest colors you will see all day. These animals are very good at being seen when they want to be and hiding when they don't. Let's see what we can find!

 In the first Tropical Diver exhibit, watch the **garden eels**. How do they protect themselves from predators? _____

Now head to the **Jellies** exhibit. These interesting looking animals do not have body parts common to other animals. They don't have eyes, a mouth, gills, a nose, etc. Jellies use their tentacles and oral arms to eat. They have stinging cells called *nematocysts* on their tentacles which paralyze their prey. The tentacles bring the food to the oral arms which start the digestion process as it moves the food to their stomach in the bell.

LABEL the body parts of the **Pacific sea nettle**: the bell, tentacles, and oral arms.



VISIT the main window in our Tropical Diver exhibit. Enjoy the beautiful, colorful fish that swim around. Don't miss the wave as it crashes above your head!

One of the interesting animals that live in the coral reef is the *coral polyp*. There can be thousands of polyps living on each piece of coral. Coral get most of their food from an algae called *zooxanthellae* that live inside them. Zooxanthellae use energy from the sun to create food for the coral using *photosynthesis* (same process used by plants).

If corals need a lot of sunlight year round, where do you think they would be found?

- a) the Arctic
- b) the Equator
- c) the Antarctic

Coral polyps have tentacles with nematocysts to catch food with. What animal do you think they are related to? (HINT: you just visited it) _____

FIND the **Hawaiian cleaner wrasse** (*small fish (2 inches long) usually located on the right side of the exhibit. It has a yellow head and bright blue body and tail with black stripe*) on the touch screen and then at the main window. Observe how it is interacting with the other animals. Cleaner wrasses get their food by eating, or cleaning, harmful parasites from other animals. Which animal(s) benefit from this relationship and why?

Look up three more animals on the touch screen, record their information, and see if you can find them in the exhibit (Be sure to look everywhere).

Animal's name	How big will it get?	Color	Interesting fact	Did you find it? Where?

Teacher Guide

GEORGIA EXPLORER

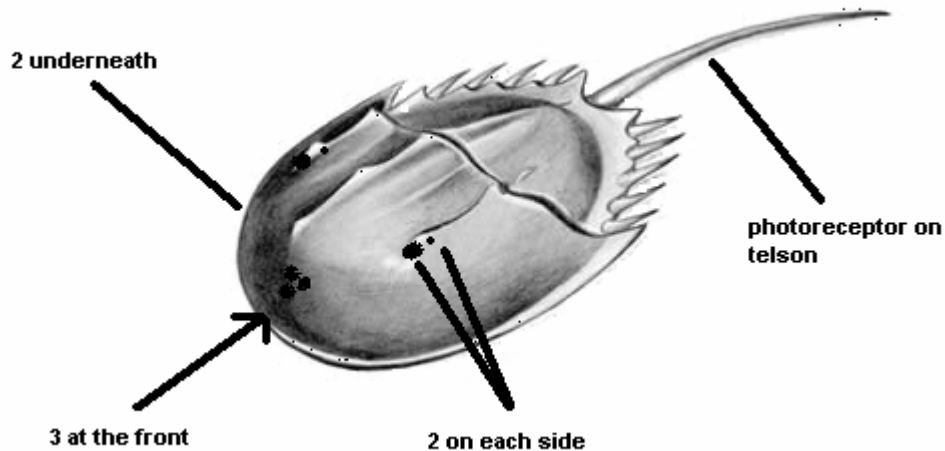
***** There are several touch pools in Georgia Explorer. Please have the students touch the animals gently, with two fingers. Also be careful to keep papers and pencils out of the water. A hand wash station is to the left of the entrance/exit of the gallery.**

VISIT the Shark and Ray touch pool! To reach down, make sure you lie on your bellies on the rocks and touch the animals lightly on their backs. (Use two fingers and touch gently; don't hold your paper over the water!) Name the three species found in this touch pool:

 cownose rays southern rays bonnethead sharks

DRAW a sketch of each animal here, identifying key features such as mouth, eyes, gills, dorsal fin, pectoral fin, caudal or tail fin.

The **Horseshoe crab** touch pool exhibit is located in front of the Gray's Reef exhibit. LISTEN to the presentation or ask a Georgia Aquarium staff member to find out how many eyes the Horseshoe crab has and draw arrows to the eyes on the drawing.



Where is the Horseshoe crab's mouth? underneath, between the legs What animals are they closely related to? Spiders and scorpions

FIND the **Loggerhead sea turtle**. Sometimes it likes to swim and sometimes it likes to nap under the rocks.

How does a sea turtle protect itself? its hard shell

Name one thing about sea turtle's body that is different from a land turtle's body:

Flippers instead of webbed feet, cannot pull head inside of shell, shell is more streamlined and less round

IDENTIFY two fish in the exhibit by using the computers by clicking the more fish button.

answers will vary

VISIT the Right Whale Theater. Watch either video and answer the following questions:

***** There are two videos shown in the theater. The students can watch either video to answer these questions.**

Why do **Northern right whales** migrate to the Georgia coast? to give birth to their calves

It is estimated that there are only about 400 Northern right whales alive right now. What do we call a species that is in danger of becoming extinct?
endangered species

TAKE the stairs up to the second level. Locate the poster on the **Turtle Excluder Device (TED)** and read it. Answer the questions below.

What does a TED do? helps turtles escape from shrimping nets

Who uses TEDs? shrimpers in the United States

Why are TEDs important? sea turtles are endangered, TEDs help them survive

SLIDE down the whale slide to the first floor! ***** Students should slide down one at a time, feet first only. They must wait until the last person is out of the slide before going down.**

Watch the sea turtle video (located near the whale's mouth in the corner) and answer these questions:

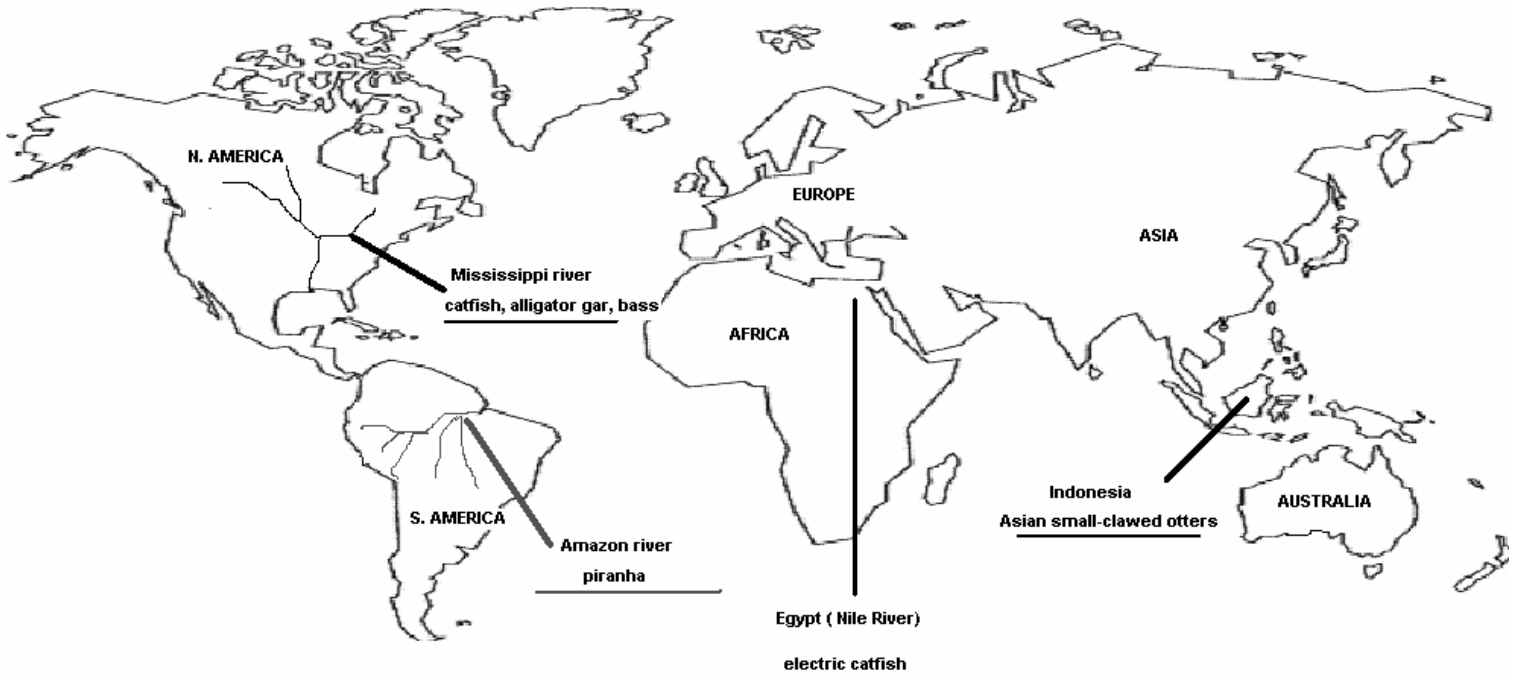
Where do the hatchlings or baby sea turtles go when they hatch? They walk across the beach to the water immediately and then swim in the sea.

What do sea turtles eat? Sea jellies

What do sea turtles have in common with the northern right whale? they are both endangered

RIVER SCOUT

Rivers and lakes are a huge part of our lives! Wherever you go you will find freshwater habitats all over the world. They are important to us and all the many different animals that live there! Let's go discover just how different all these animals can be! As you go through the gallery, fill in the blanks on the world map with the name of some animals that might live in those areas:




👁️ Crawl through the tunnel under the river! This river is a North American river that has many different kinds of fish. Look at all the different kinds of mouths these animals have! While in the tunnel, peek through the bubble window and find a fish with a blue dot on its gills that is a Bluegill fish.



Next, stop by the alligator exhibit and check out these reptiles. In the wild alligators are “sit and wait” or ambush predators, meaning they wait for their food to swim by and then reach out and grab it. Where do you think alligators are on the food chain? **Top** or bottom?

Take a good look at the alligator. What part of their bodies is above water? **It will depend on the alligator the student observe - sometimes it will just be their eyes and nose with their body completely submerged, other times half and half, and sometimes the whole body will be out sunning itself for warmth.**

Are alligator air or water breathers? **Air breathers**

Do you know why alligators don't eat the turtles in the exhibit? It's because we feed them so well they don't need to snack, just like with the sharks! See if you can find and identify one of the freshwater turtles.

 **LOOK and COMPARE** the Striped bass in the river above the Alligator exhibit to the American alligator. Observe the animals for a few minutes and complete chart below. Once finished determine the classification of these animals (mammal, fish, reptile, bird, amphibian, ect.) based on the characteristics listed below. List them in the blanks.

Striped Bass	Characteristic	Alligator
scales	Covering	scales
gills	How does it breathe?	air
tail	Movement	tail
	Coloring/pattern	
water	Habitat (water, land, land & water)	Land and water
vertebrate	Vertebrate or invertebrate	vertebrate
cold	Cold or Warm blooded	cold
fins	Body parts	Large jaw, claws, 4 legs
fish	What type of animal?	reptile

VISIT the electric fish exhibits. All three of these animals have adapted to use electricity, though they may use it in different ways. What does each of these animals use electricity for?

Electric catfish: find prey / stun prey

Electric eel: navigate / stun prey

Elephantnose fish: navigate / communicate

OBSERVE the **Asian small-clawed otters** for a few minutes. What are they doing?

answers will vary

What makes Asian small-clawed otters different from all other otter species? they use their paws to hunt

Name two human activities that impact the habitat of the Asian small-clawed otter:

hunting and development of land

COLD WATER QUEST GALLERY

Our first stop is in the **Kelp Forest Exhibit** at the entrance to the Cold Water gallery. *** **Gather students in a tight group in front of the kelp forest to avoid traffic jams at the gallery entrance.**

This exhibit and the touch pool across the way show the fragile animals found in tide pools and kelp forests in the northwestern United States from California to Washington.

- The Garibaldi fish inspired the Aquarium mascot named Deepo
- Can you find the Senorita fish or the Horn shark? Where do they each live in a kelp forest? Senorita fish will be swimming in the kelp plants and Horn shark on the bottom

Come sit by the beluga whales and relax. Listen to the aquarium staff on the microphone as they will be sharing some have great information about these amazing animals. *** **Seat children in one tight group in front of the window to allow space for other school groups and visitors.**

Where do Beluga whales live in the wild? Artic Ocean
 Which two belugas are related in the exhibit? Natahsa and Maris
 How do the following adaptations help belugas to survive?

Adaptation	Function
Dorsal Ridge	conserves body heat (less surface area than dorsal fin); can be used to break ice for breathing
Flexible Neck and Lips	helps belugas reach and pick up food from ocean floor (they swim too slowly to chase schools of fish)
Thick Blubber	layers of fat keep belugas warm in icy waters
Melon (vocalization)	use sounds to communicate, also to navigate and hunt by echolocation
Blow Hole	breathe without exposing the whole head to predators above water

So far on your adventure you have seen many vertebrates such as fish, reptiles, and mammals, and a few invertebrates. What is the difference between a vertebrate and invertebrate? vertebrates have back bones and invertebrates don't

 **Your next stop is our Giant Pacific octopus!** Can you find her in the exhibit? Be sure to watch the video to the left of the exhibit.

Is the Giant Pacific octopus a vertebrate or invertebrate?

_____ **invertebrate** _____

What are octopuses related to? ___ **Mollusk, clams, and squid** _____

Octopuses are considered masters of disguise. Why? _____ **their ability to camouflage and change color** _____

On your way to the southern sea otter, check out how the Weedy sea dragons use their leafy appendages to help them hide. What is it called when an animal blends in with its surroundings?

_____ **camouflage** _____

VIEW the **Southern sea otters**. Southern sea otters are different from other otters in that they spend most of their time in the water. How do they stay warm since they don't have blubber? ___ **they have the densest fur of any animal; hold less furry paws out of the water; eat all day long to keep metabolism high**

How do they keep from drifting away in the water?

_____ **they wrap kelp around their bodies while they sleep**

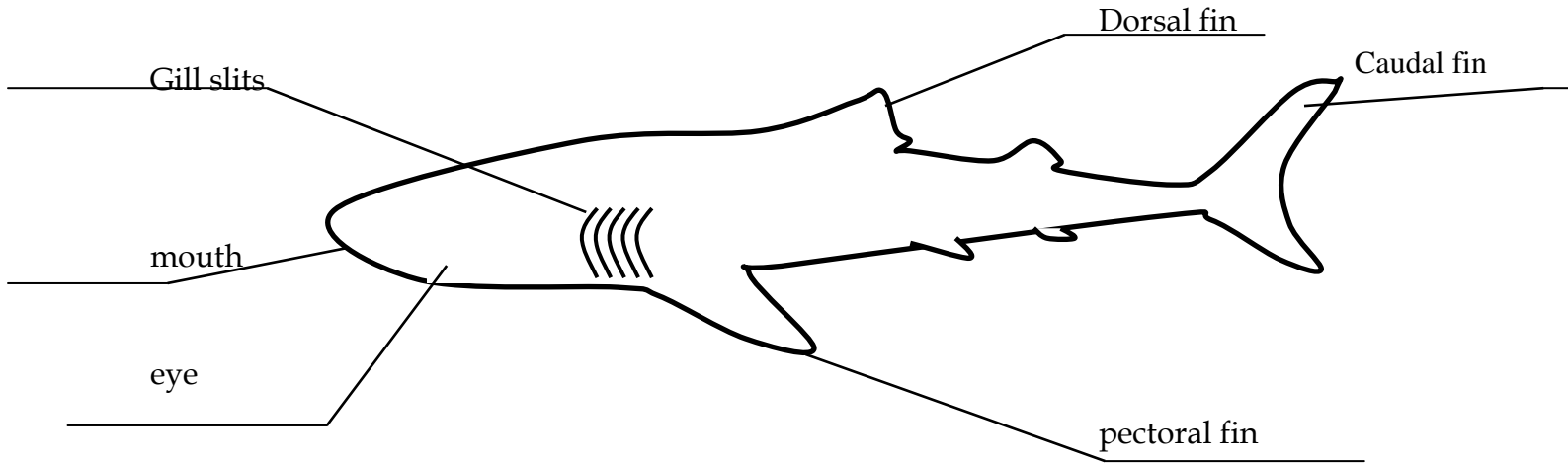
DID YOU KNOW - Southern sea otters eat many types of prey including sea urchins, snails, mussels, crabs, scallops, fish, barnacles, octopus, worms and squid. They must eat 25 percent of their body weight every day to maintain their normal body temperature in this cold environment. So for our otters, Oz and Gracie they must consume approximately 12 pounds of food to stay warm.

OCEAN VOYAGER

Pick up a species ID card before you enter the Ocean Voyager gallery.

*** The Ocean Voyager tunnel is best used for simply viewing the animals. Activities should be done at the main window. At the window, please have the students sit in a tight group rather than one long row to leave space for others.

Label the **Whale shark** drawing below with the following parts: eyes, gill slit, dorsal fin, caudal fin, pectoral fin, and mouth:



At the viewing theater of Ocean Voyager **OBSERVE** the **grouper**, **Whale shark**, and **Cownose stingray**. Note the following characteristics in order to discover similarities and differences.

Feature	Whale Shark	Grouper	Cownose stingray
Location of mouth	Front	Front	Bottom
Location of gills	Side	Side	Bottom
Number of gill slits/openings	5-7	1	5-7
How does it move?	Tail moves side to side	Tail moves side to side	Wings move up and down

Color/Patters?	Black with white spots on top and white belly	Light grey or light gray with black spots	Brown or black on top and white on bottom

The grouper is considered an *ambush predator* (they hide in dark spaces and watch for food). What adaptation do they have to look for food? their eyes can move independently (without their head moving).

Instead of teeth, stingrays have flat, hard *mouthplates* to crush their food. What do you think they eat? (HINT: look at where they are in the exhibit and where their mouth is located) animals with shells - crabs, lobsters, clams, mussels, snails

What do you think a whale shark eats? krill and other types of plankton like copepods

Can you find another filter feeder? manta ray

FOOD CHAIN - Based on what you have learned and seen so far in the Ocean Voyager and Cold Water Quest galleries, draw a food chain one might find in the ocean with arrow to show what eats what.

For example: Sunlight (*producer*) ← phytoplankton (algae) ← zooplankton like krill and copepods ← whale shark (*consumer*)

Be sure to label the producer and consumers.

If you took one of the animals out of the food chain, how would that affect the ecosystem? Basic answer is the some animals would increase because of no predation; other would decrease because of no prey. Here is a specific answer if sea otters were removed: sea urchin populations would increase; sea urchins would consume kelp forests; other animals' habitat would be destroyed (animals that hide in kelp forest).

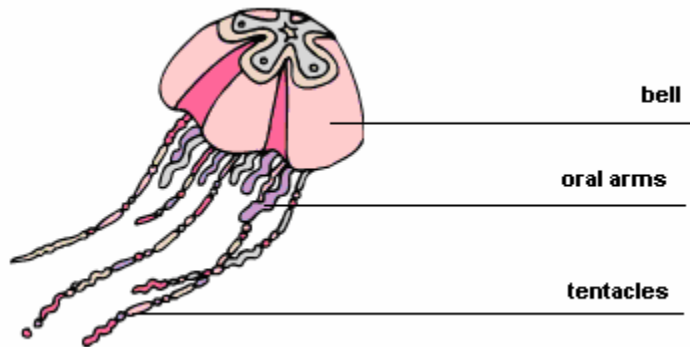
Drop off the Species ID card in the container as you exit the Ocean Voyager gallery.

TROPICAL DIVER

In the first Tropical Diver exhibit, watch the **garden eels** as the fish come by. How do they protect themselves from predators? _____ **by hiding in their burrows** _____.

VISIT the **Jellies** exhibit. These interesting looking animals do not have body parts common to other animals. They don't have eyes, a mouth, gills, a nose, etc. Jellies use their tentacles and oral arms to eat. They have stinging cells called *nematocysts* on their tentacles which paralyze their prey. The tentacles bring the food to the oral arms which start the digestion process as it moves the food to their stomach in the bell.

LABEL the body parts of the **Pacific sea nettle**: the bell, tentacles (long, spaghetti-like structures), oral arms (lacy structures).



VISIT the main window in our Tropical Diver exhibit. *** **Seat children in one tight group at the window to leave space for others.** Enjoy the beautiful, colorful fish that swim around. Don't miss the wave as it crashes above your head!

One of the interesting animals that live in the coral reef is the *coral polyp*. There can be thousands of polyps living on each piece of coral. Coral get most of their food from the *zooxanthellae* that live inside them. Zooxanthellae use energy from the sun to create food for the coral using *photosynthesis*.

If corals need a lot of sunlight year round, where do you think they would be found?

- a) the Arctic
- b) the Equator**
- c) the Antarctic

In addition to the food created by the zooxanthellae, coral polyps have tentacles with nematocysts to catch food. What animal do you think they are related to? ___jellies and sea anemones - also have stinging tentacles___

FIND the **Hawaiian cleaner wrasse** (*small fish (2 inches long) usually located on the right side of the exhibit. It has a yellow head and bright blue body with black stripe*) on the touch screen and then at the main window. Observe how it is interacting with the other animals. Cleaner wrasses get their food by eating, or cleaning, harmful parasites from other animals. Which animal(s) benefit from this relationship and how? ___both animals benefit - the cleaner wrasses get food, the other fish have harmful parasites removed___

Look up three more animals on the touch screen, record their information, and see if you can find them in the exhibit (Be sure to look everywhere) **Answers will vary based on the animal selected**

Animal's name	How big will it get?	Color	Interesting fact	Did you find it? Where?

Water Address (pre-visit activity)

Grade: 3rd – 5th

Objective: Students will identify aquatic animals and their habitats by analyzing clues that describe the animals' adaptations.

Duration: 50 minutes

Vocabulary: adaptation, camouflage, coral reef, fish, mammal, freshwater, saltwater, predator, prey

Materials:

- 10 sets of "Adaptation Cards" for each group of students
- pencils and paper for scorekeeping
- 10 sets of animal picture cards (optional)
- 10 sets of habitat cards (optional)
- globe or world map (optional)

Background:

Three-quarters of Earth's surface is covered with water. There are many different types of aquatic habitats such as open ocean, coral reef, lakes, rivers, marshes, and swamps. To survive in these different environments animals have special features, or adaptations. These adaptations have developed over time and serve several very important purposes. They can help an organism get food, protect themselves from enemies, and survive in many different conditions.

There are many ways in which animals have adapted to surviving in aquatic habitats. Fish have streamlined bodies and fins to help them move through the water quickly. Their coloration helps them to hide from predators or helps predators sneak up on their prey. Some fish have added protections such as spines and spots on the back half of their bodies to confuse their predators. Fish also have gills so that they are able to filter the oxygen out of the water to breathe. Some aquatic birds have webbed feet for swimming as well as glands that produce a waxy oil for waterproofing their feathers. Aquatic animals also have adaptations to allow them to survive in severe temperatures. For example, animals like belugas and sea lions have blubber (a thick layer of fat beneath their skin) to protect them from cold water. Sea otters do not have blubber, but they have very thick fur that serves the same function.

Procedure:

1. Discuss how Earth's surface is covered with about 71% water and demonstrate this using a globe or map. Aquatic habitats are home to thousands of species of animals. Tell the students that today they are going to learn about different aquatic habitats, some of the animals that live there, and the adaptations that allow them to survive in their habitat.

2. Make a list on the board with the students of all the aquatic habitats they can think of. Make sure to include both freshwater and saltwater habitats. (Discuss the difference between these two terms if necessary.)
3. Tell the students that each one of these habitats includes animals that have adapted to the specific conditions of that habitat to be able to survive there. Have the students define adaptation. Give an example such as fish adapting to live in water by having gills.
4. Tell the students they are going to play a riddle game in which they must guess an organism's identity and "water address" (or habitat) based on the clues on the adaptation card. Have students form groups of three or four.
5. Hand out a set of the "Adaptation Cards", "Animal Cards", and "Habitat Cards" to each group (last two sets are optional depending on your group). Instruct students to spread out the animal and habitat cards on their desks or floor.
6. Explain that each card lists four adaptations of a certain animal. Based on the clues, students will match the animal and the habitat to the adaptations on the card (animal and habitat cards are an extra help for students).
7. Each student in the group should take turns being the "reader". The reader starts the game by picking an "Adaptation Card" and reading the clues one at a time until another student in the group correctly identifies the animal and the habitat (using the pictures for help). Answers are listed at the bottom of each card.
8. The student who correctly guesses both the name of the organism and its water address (habitat) receives points for the group (a scorekeeper should keep track of the group's points). Keep track of the score as follows:
 - One clue read = four points
 - Two clues read = three points
 - Three clues read = two points
 - Four clues read = one point*You may want to post the point scale on the board or somewhere in the classroom.
9. The students continue playing the game and keeping track of the group's score until all the adaptation cards have been used. The group then tallies up their score and when all groups have finished they can compare their score with other groups to determine a winner!
10. To wrap up, make a list with the students of all the different water-related adaptations they learned about while playing the game.

Assessment:

- ◆ Walk around the room while students are playing the game to make sure all are participating.
- ◆ Have students make a list of other animals that live in the aquatic habitats provided on the cards.
- ◆ Have students do a written reflection about what they learned during the activity.

Extension:

Students can create their own aquatic animal in a fictional water environment. Have them imagine special features or behaviors the animal would need to live in their environment. The students should draw a picture of the habitat and the animal as well as write a description. The students should tell how the animal gets its food, how it camouflages, as well as other ways it is able to survive successfully in its habitat. They can evaluate each others work and offer suggestions. Let them be creative and have fun with it!

Resources:

Project WET (Water Education for Teachers). 2006. 9/27/07 <<http://www.projectwet.org>>.

Goodman, Susan E. Claws, Coats, and Camouflage. Minneapolis: Millbrook Press, 2001.

Hewitt, Sally. All Kinds of Habitats. Danbury: Children's Press, 1999.

Rose, Elizabeth. Animal Adaptations for Survival. PowerKids Press, 2006.

<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ I am able to change the color of my skin to camouflage. ◆ I have no bones so I am able to squeeze into small spaces. ◆ The only hard part of my body is my beak which I use to eat and defend myself. ◆ I have strong suction cups which I use to grasp and hold on to things. <p><i>Answer: Octopus- lives in the coral reef</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ I am grey or brown to blend in with my habitat. ◆ I breathe using gills, which take oxygen from the water. ◆ My mouth is located in the front of my body so I can catch other fish easily. ◆ I have a beard or “barbels” that help me to sense where my food is in the murky water. <p><i>Answer: Catfish- lives in the river</i></p>
<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ My body is covered in smooth scales so I can swim gracefully through the water. ◆ I am bright colors so I can blend in with my habitat. ◆ I have sharp spines located on both sides of my tail fin to defend myself from predators. ◆ When I am scared I will hide in small nooks and crannies. <p><i>Answer: Tropical fish- lives in coral reef</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ My underside is light so that I can camouflage while swimming. ◆ I have gills on the underside of my body as well as holes on top of my head so I can breathe when laying on the ocean floor. ◆ I have tooth plates to crush things that live on the bottom of the ocean such as crabs. ◆ I use my fins to cover myself with sand to hide from predators. <p><i>Answer- Cownose ray- lives in the open ocean</i></p>

<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ I move using hundreds of tiny tube feet all over my body. ◆ I have spines all over my body for protection. ◆ My color helps me to camouflage in my environment. ◆ I also use my spines to dig into stones to hide. <p><i>Answer: Sea urchin- lives in coral reef</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ My light color helps me to camouflage in my habitat. ◆ Blubber helps keep my body heat inside. ◆ My teeth and flexible lips help me to eat animals off the ocean bottom. ◆ I can hold my breath for 20-25 minutes! <p><i>Answer: Beluga whale- in the arctic (ocean)</i></p>
<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ I have no teeth but powerful jaws to crush food. ◆ My flippers help me to swim gracefully in the ocean. ◆ I cannot pull my head and arms into my shell. ◆ I like to rest underneath rock ledges (which also protect me). <p><i>Answer: Sea turtle – lives in open ocean and/or coral reef</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ My color often depends on the color of the water. ◆ I like to build a nest of mud or sand near brackish water. ◆ I am cold-blooded so I can live in a wide range of temperatures. ◆ I do not feed during the cooler months. <p><i>Answer: Crocodile- swamp</i></p>
<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ I have webbed feet. ◆ I have glands that produce a waxy oil that waterproofs my feathers. ◆ I have a wide, flat beak adapted for scraping the bottom of my habitat for food. ◆ I migrate to warmer areas in the winter for food and shelter. <p><i>Answer: Duck- marsh, river</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> ◆ I move with the movement of the waves. ◆ I have stinging tentacles that help me to catch my food. ◆ I am clear so my predators find me hard to spot! ◆ I have special “arms” that bring my food up to my “mouth”. <p><i>Answer: Sea Jelly- open ocean and/or coral reef</i></p>

Adaptation Card

- ◆ I am a fish that breathes with gills.
- ◆ I use my long snout to suck up tiny shrimp.
- ◆ I have fins for swimming located on my lower body and my head
- ◆ I give live birth from a pouch (males only!).

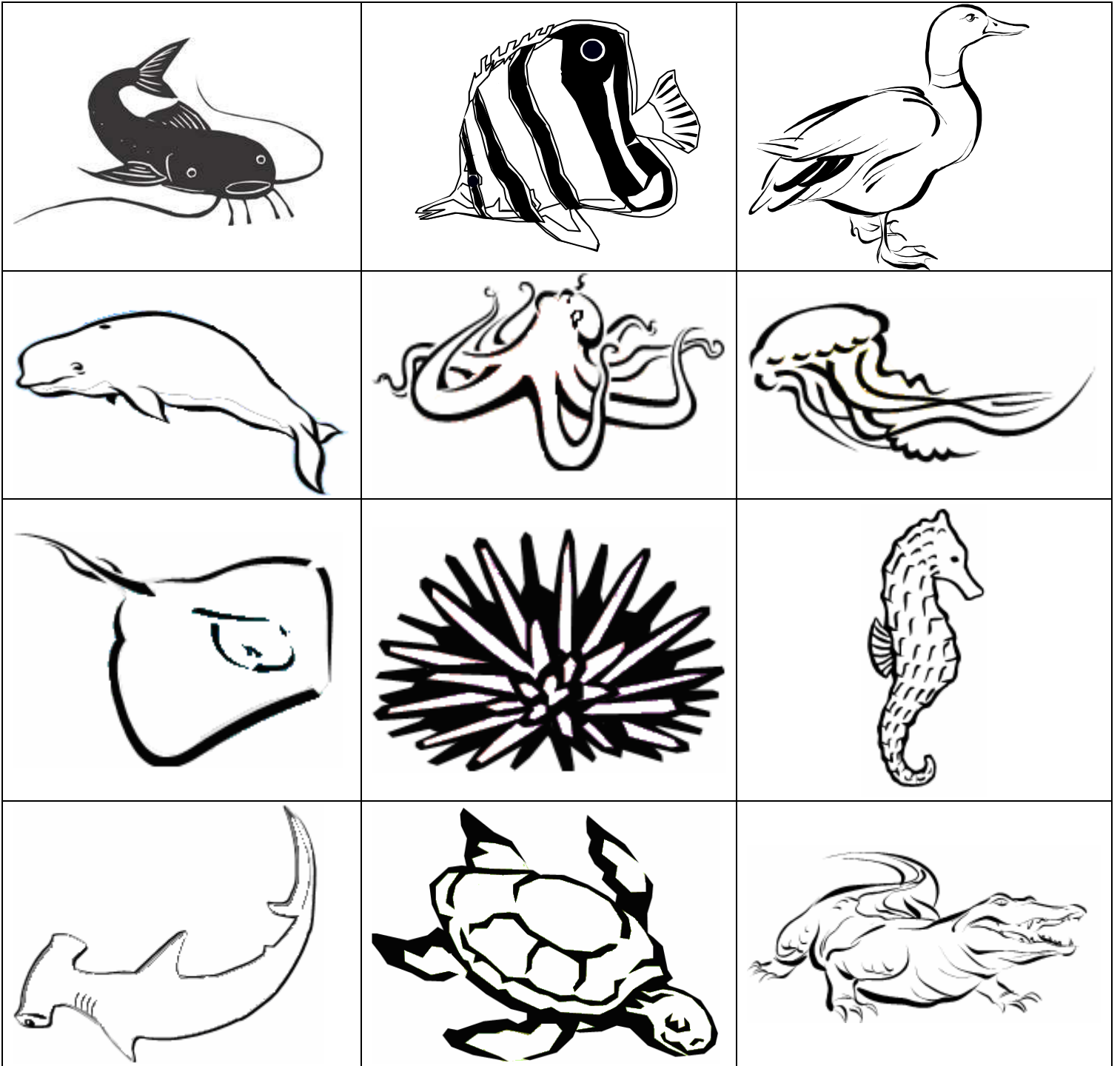
Answer: Seahorse- coral reef

Adaptation Card

- ◆ I have gills that I use for breathing.
- ◆ I use my sharp teeth for catching and eating stingrays and other fish.
- ◆ The strange shape of my head helps me to maneuver through the water.
- ◆ My skin is made of tiny teeth that help to protect me.

Answer: Hammerhead shark- open ocean, coral reef

ANIMAL CARDS



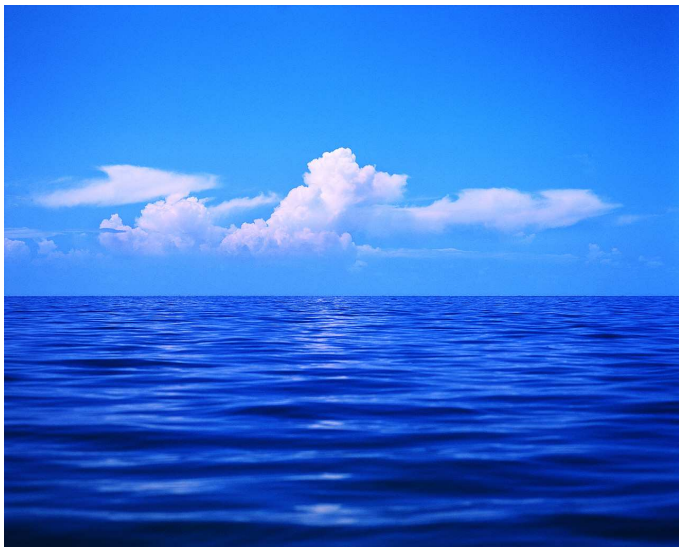
HABITAT CARDS



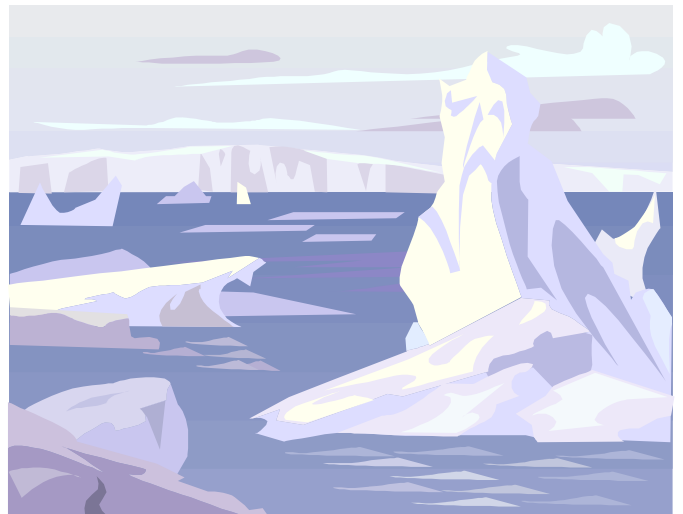
CORAL REEF



RIVER



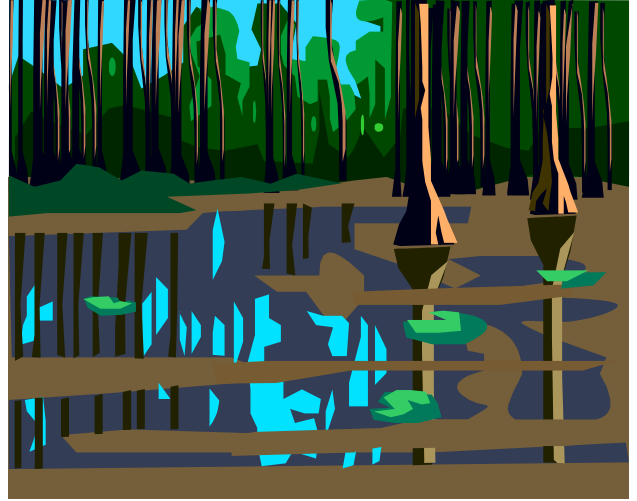
OPEN OCEAN



ARCTIC



MARSH



SWAMP

Awesome Aquatic Animals! (pre-visit activity)

Objective: Students will investigate the adaptations that allow an animal to survive successfully in its habitat.

Grade: 3rd – 5th

Duration: 45 minutes

Vocabulary: Caudal fin, anal fin, dorsal fin, pectoral fin, lateral line, gills, pelvic fin, blowhole, dorsal ridge, flukes, melon, pectoral flipper, rostrum

Materials:

- “Frank the Fish” worksheet
- “Shelly the Shark” worksheet
- “Billy the Beluga” worksheet
- Overheads of each unlabeled worksheet
- Answer keys

Background:

There are many different types of organisms that live in aquatic environments. While they do all live underwater, they do not necessarily share the same body parts. For this lesson we are going to compare and contrast fish, sharks, and whales as each has adapted to survive in their aquatic habitat.

Fish are cold-blooded animals that use gills to breathe. There are two types of fish: bony fish and cartilaginous fish. Bony fish have skeletons made of bones like humans. Cartilaginous fish, such as sharks and rays, have skeletons made of cartilage which is the flexible tissue that makes up our ears and noses. Some similarities and differences between the two types of fish include:

- While both types of fish have gills to breathe, bony fish have one gill opening covered by an operculum. Sharks have five to seven separate gill slits.
- Both bony fish and cartilaginous fish move their tail fin (caudal fin) left and right to move through the water. They use their pectoral fins to stop, move forwards, or turn. Both use the dorsal fin for stability and to help the fish balance from side to side.
- Bony fish are covered with scales for protection and provide color. Cartilaginous fish, however, are covered with dermal denticles (modified teeth).

- Bony fish have lateral lines, or a row of sensory pores they use to determine differences in water pressure that could indicate a change in depth or approaching predators. Cartilaginous fish also have lateral lines as well as ampullae of Lorenzini, which detect weak electromagnetic signals generated by prey. Sharks also have an excellent sense of smell, a trait that they do not share with bony fish.

Whales are mammals, meaning they have hair, breathe air with their lungs, give birth to live calves, nurse their young, and are warm-blooded. Whales breathe through a blowhole on top of their head, and move their caudal fin, or flukes, up and down to swim instead of side-to-side like a fish. Like fish, whales also use their pectoral fins to stop, move forwards, or turn. However, unlike fish, whales also use their fins to thermoregulate – to warm or cool themselves to maintain their body temperature. Most whales have a dorsal fin with the exception of the Beluga and Narwhal whales that live in the Arctic where the water is often covered with ice. Instead Belugas have a hard dorsal ridge that runs along their back that they use to break breathing holes in the ice when necessary.

Whales are known to use echolocation to locate food and objects under the water. When a whale echolocates, it creates a high-pitched sound, usually in the form of a click or whistle, from the nasal passages located just inside its blowhole. It then concentrates and directs that sound with its melon, a round, fatty organ found on top of the whale's head. The sound continues outward until it bounces off of an object and then echoes back to the whale, revealing where an object is located, the object's shape, and size, and how fast it is traveling.

One of the most remarkable characteristics of whales is their ability to vocalize and create songs. Whale songs vary from simple clicks to complex vocalizations, with distinct beginnings and ends to the song, and can be heard for many miles under the water. Whales use songs to communicate with each other. For example, they use songs to find a mate or to keep track of their young.

Procedure:

1. Brainstorm with the students some aquatic animals they know. List them on the board.
 - a. Challenge students to give specific animals and interesting characteristics that each has (ex. Hammerhead Shark has a flattened hammer-like head)
2. After brainstorming, introduce the three specific types of aquatic animals that are pertinent to this lesson: bony fish, cartilaginous fish, and marine mammals. Explain the similarities and differences between them.
3. Pass out the three worksheets and have students work in groups or individually to label the diagrams. Using an unlabeled overhead of each animal, have the students help you fill in the blanks and explain how each part is used.

4. Have students go back to the list on the board to identify which animal on the list is a bony fish, cartilaginous fish, and which are marine mammals. Have students explain why the animal belongs there (hint: body parts).

Assessment:

1. Student participation in the worksheet and the group discussion.

Extension:

- Have students complete a Venn Diagram together on the board comparing two of the three types of aquatic animals discussed in this exercise. Bony and cartilaginous fish are recommended. Have the students discuss the similarities and differences between the two types of fish.
- Have students create their own unique aquatic animal based on what they have learned. Students should be challenged to be creative with their animal – create a hybrid fish/mammal. Once complete, students would show their animal to their peers and explain why they chose certain parts and how their fish would use those parts to survive in its environment. Supplies needed would include crayons, markers, watercolors, construction paper, glitter, shiny plastic, fabric scraps, glue, and/or tape.

Resources:

Parker, Steve. *Eyewitness Fish*. 2005: DK Publishing Inc.

MacQuitty, Miranda. *Eyewitness Sharks*. 2004. DK Publishing Inc.

Reeves, Randall R., Brent S. Stewart, Phillip J. Clapham, & James A. Powell. *National Audubon Society Guide to Marine Mammals of the World*. 2002. Chanticleer Press, Inc.

Georgia Aquarium. "Coldwater Quest: The Chilly Unknown – Beluga Whales." 9/28/07

<http://www.georgiaaquarium.org/animalguide/coldwaterquest/belugawhale.aspx>

Mojetta, Angelo. *Sharks*. 2004: White Star Publishers

Frank the Fish

Read the definitions, and then label the fish diagram below. (Note: not all fish have all of the fins defined below.)

anal fin - the fin on the lower side of the body near the tail

caudal fin - the tail fin

dorsal fin - the fin on the upper side of the body

eye - sight organs located on the head

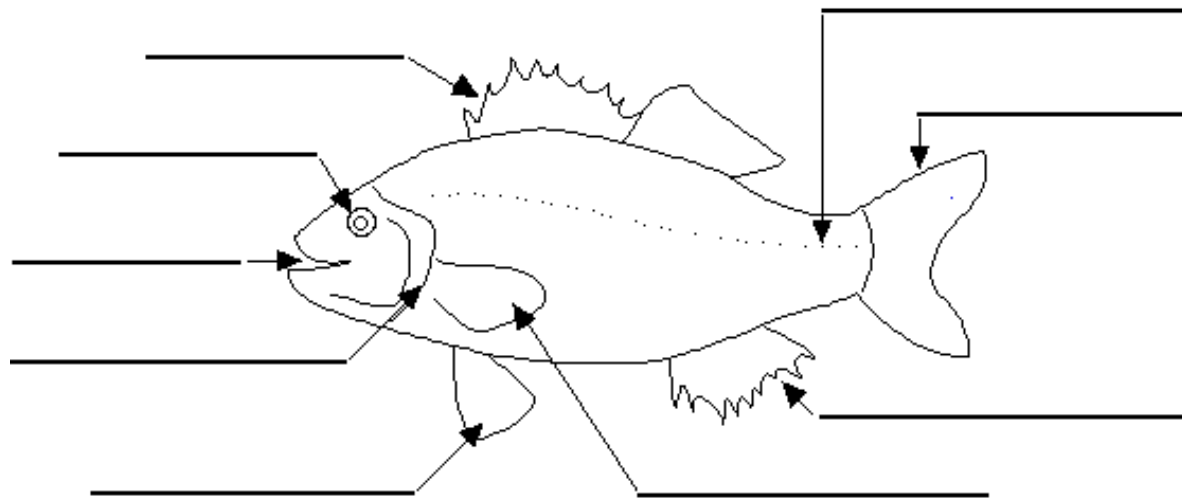
gills - fleshy organs that are used for breathing - they are located on the side of the head

lateral line - a series of sensory pores (small openings) that are located along the sides of fish - they sense vibrations in the water

mouth - the part of the body which the fish uses to catch food - it is located at the front of the body

pectoral fin - each of the paired fins on either side of the body, near the head

pelvic fin - each of the paired fins on the lower side of the body, near the head



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Shelly the Shark

Read the definitions, and then label the shark diagram below. (Note: not all sharks have all of the parts defined below.)

anal fin - the fin on the lower side of the body near the tail (not on all sharks)

caudal fin - the tail fin

eye - sight organs located on the head

first dorsal fin - the fin on the upper side of the body nearest the head

gills - fleshy organs that are used for breathing - they are located on the side of the head

mouth - the part of the body which the fish uses to catch food - it is located at the front of the body

nostril - paired slits on the underside of the snout. Water continually flows through the nostrils, giving the shark olfactory (sense of smell) information. Unlike humans, shark nostrils have nothing to do with breathing - they are not even connected to the mouth.

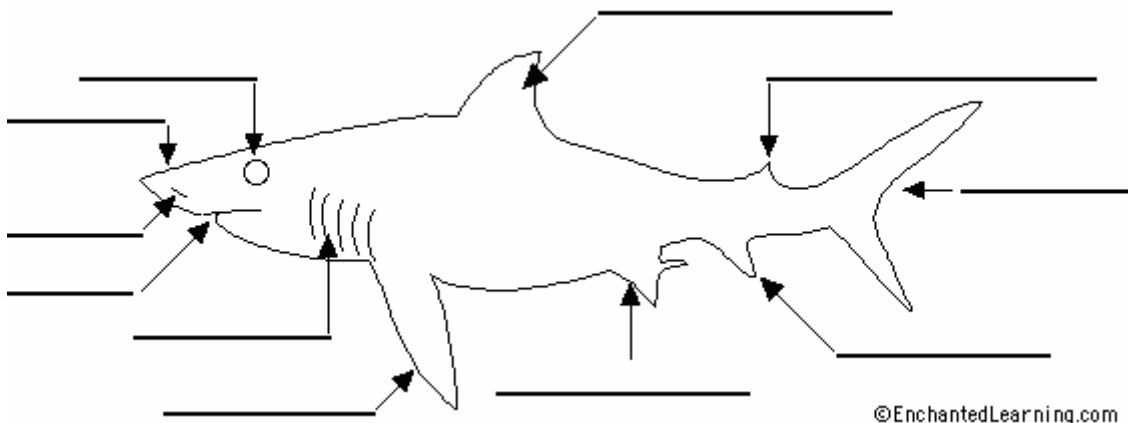
pectoral fin - each of the paired fins on either side of the body, near the head

pelvic fin - each of the small, paired fins on the lower rear side of the body

second dorsal fin - the fin on the upper side of the body nearest the tail

snout - the front part of the shark's head

ventral fin - each of the paired fins on the lower side of the body, near the head



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Billy the Beluga

Read the definitions, and then label the beluga diagram below. (Note: not all whales have all of the parts defined below.)

blowhole - hole on the top of the head that they breathe air through

dorsal ridge - the raised area in the center of the back used to break holes in the ice

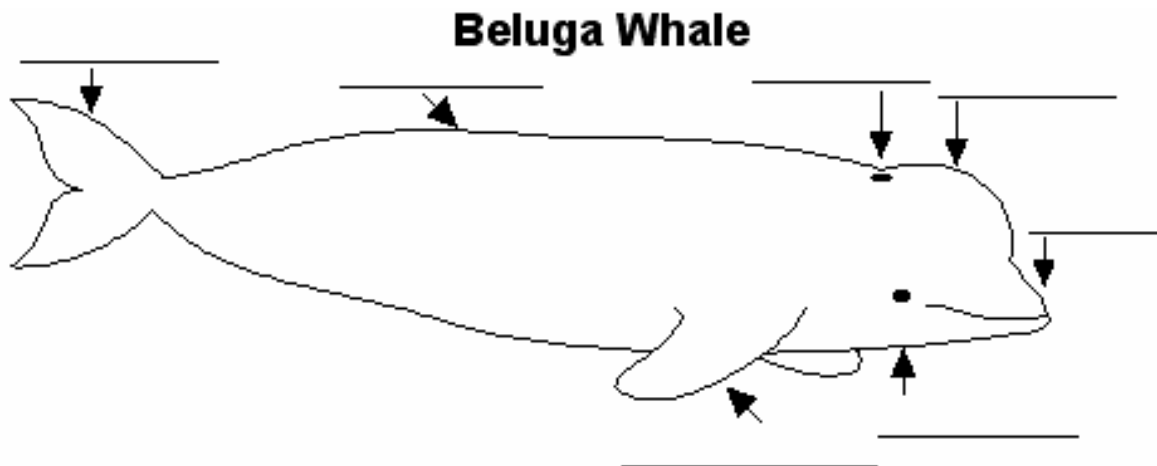
eye - sight organs located on the head

flukes - the two lobes that make up the tail of the whale

melon - the rounded structure on the top of the head located in front of the blowhole.

pectoral flipper - each of the paired fins on either side of the body, near the head

rostrum - the part of the body which the whale uses to catch food - it is located at the front of the body



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Frank the Fish - Answer Key

Read the definitions, and then label the fish diagram below. (Note: not all fish have all of the fins defined below.)

anal fin - the fin on the lower side of the body near the tail

caudal fin - the tail fin

dorsal fin - the fin on the upper side of the body

eye - sight organs located on the head

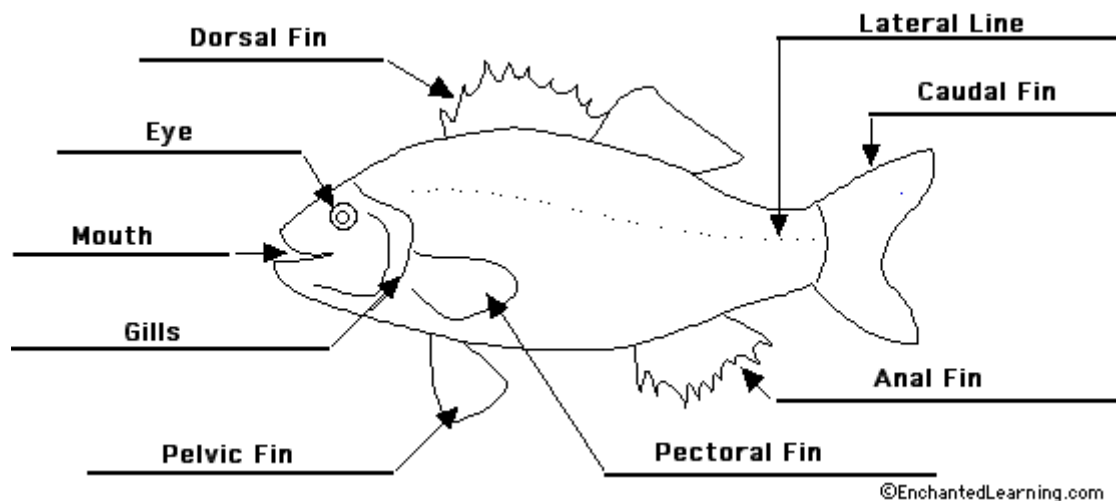
gills - fleshy organs that are used for breathing - they are located on the side of the head

lateral line - a series of sensory pores (small openings) that are located along the sides of fish - they sense vibrations in the water

mouth - the part of the body which the fish uses to catch food - it is located at the front of the body

pectoral fin - each of the paired fins on either side of the body, near the head

pelvic fin - each of the paired fins on the lower side of the body, near the head

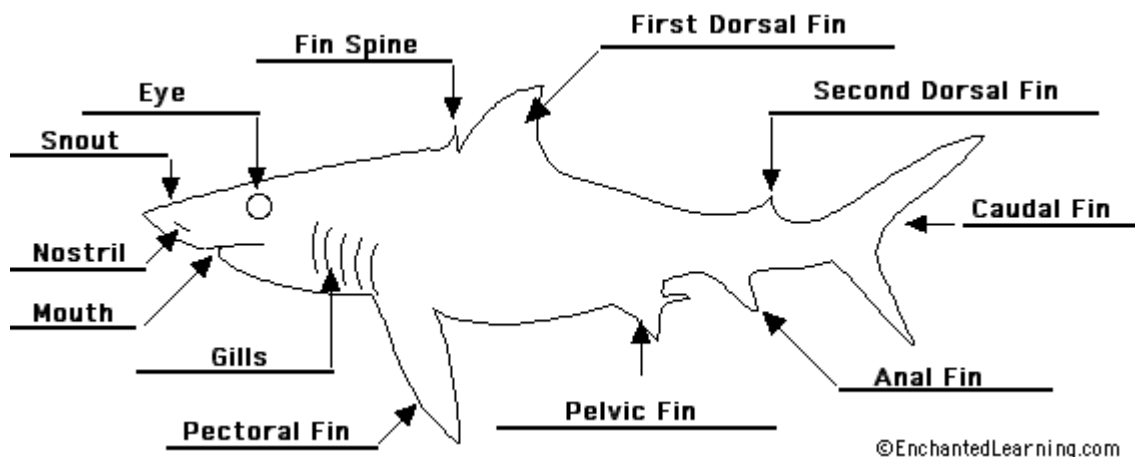


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Shelly the Shark - Answer Key

Read the definitions, and then label the shark diagram below. (Note: not all sharks have all of the parts defined below.)

<p>anal fin - the fin on the lower side of the body near the tail (not on all sharks)</p> <p>caudal fin - the tail fin</p> <p>eye - sight organs located on the head</p> <p>first dorsal fin - the fin on the upper side of the body nearest the head</p> <p>gills - fleshy organs that are used for breathing - they are located on the side of the head</p> <p>mouth - the part of the body which the fish uses to catch food - it is located at the front of the body</p>	<p>nostril - paired slits on the underside of the snout. Water continually flows through the nostrils, giving the shark olfactory (sense of smell) information. Unlike humans, shark nostrils have nothing to do with breathing - they are not even connected to the mouth.</p> <p>pectoral fin - each of the paired fins on either side of the body, near the head</p> <p>pelvic fin - each of the small, paired fins on the lower rear side of the body</p> <p>second dorsal fin - the fin on the upper side of the body nearest the tail</p> <p>snout - the front part of the shark's head</p> <p>ventral fin - each of the paired fins on the lower side of the body, near the head</p>
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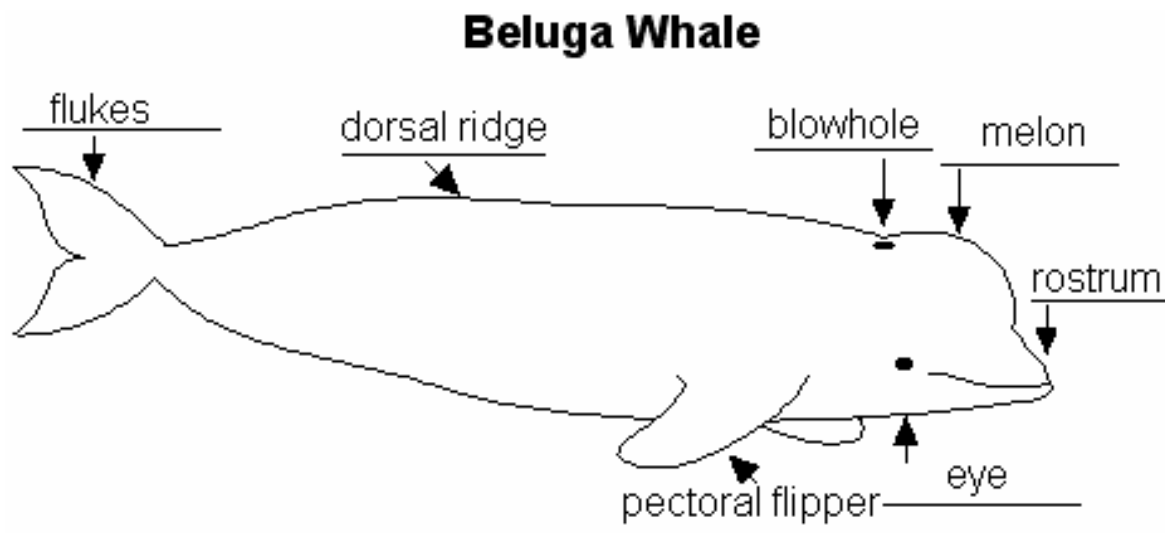


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Billy the Beluga - Answer Key

Read the definitions, and then label the beluga diagram below. (Note: not all whales have all of the parts defined below.)

<p>blowhole - hole on the top of the head that they breathe air through</p> <p>dorsal ridge - the raised area in the center of the back used to break holes in the ice</p> <p>eye - sight organs located on the head</p> <p>flukes - the two lobes that make up the tail of the whale</p>	<p>melon - the rounded structure on the top of the head located in front of the blowhole.</p> <p>pectoral flipper - each of the paired fins on either side of the body, near the head</p> <p>rostrum - the part of the body which the whale uses to catch food - it is located at the front of the body</p>
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How Big AM I? (Post-visit Activity)

Compare the following weights and length of some of the animals you have seen today and answer the following questions.

Animal	Length	Length (m)	Weight	Weight (g)
Whale shark	20 ft		3,000 lbs	
Beluga whale	12 ft		1,500 lbs	
Hammerhead shark	9 ft 9 in		500 lbs	
Giant grouper	4 ft 6 in		350 lbs	
Zebra shark	5 ft		80 lbs	
Sea otter	4 ft		60 lbs	
Cownose ray	1 ft 8 in (disc width)		30 lbs	
Blacktip reef shark	29 in		17 lbs	
Penguin	20 in		7 lbs	
Yellowtail sweetlips	23 ½ in		13 lbs	
Hawaiian cleaner wrasse	4 in		3 oz	

- 1) How many groupers equal the weight of one whale shark?
- 2) If we were to line up 6 penguins head to toe, they would be as long/tall as a _____.
- 3) How many beluga exhibits could fit in the Ocean Voyager exhibit? The beluga whale exhibit contains 800,000 gallons of salt water and ocean voyager contains 6,300,000 gallons of salt water?
- 4) Convert weights and lengths to metric (5th grade)

Best in Show (Post-visit Activity)

Grade Level: 3rd- 5th

Objective: Students will identify their favorite exhibit and write a persuasive essay as to why it should receive the “Best in Show” award.

Duration: 30 minutes over a couple of days

Materials: paper, pencil and computer (optional)

Procedure:

1. Have student reflect on the exhibits they visited at the Aquarium and record their favorites.
2. Have each student rank their list with the best at the top.
3. Tell the students they are to write a short essay to convince you and their classmates as to why the exhibit they picked was the best and should receive the “Best in Show” award.
4. If time permits, have student read their essay aloud. Once everyone has read their essays take a silent vote to see which exhibit won “Best in Show”

Assessment:

1. Develop a rubric at the appropriate grade level to score each student based on the components of persuasive essay and grammar use.

Classification Station! (Post activity)

Grade Level: 5th

Objective: Students will classify animals that they saw at the Georgia Aquarium.

Duration: 30 minutes

Vocabulary: Mammal, Fish, Reptile, Arthropod, Cnidarian, Invertebrate, Vertebrate, Cartilage

Materials: Copy of Classification Title Cards (to be hung on a board)
Copy of the Animal Cards and Tape

Background: All animals are classified using a scientific system. The system is Kingdom, Phylum, Class, Order, Family, Genus and Species. Scientists use this system to help them understand the anatomy, genetics, and relatives of animals. Scientists classify animals according to various characteristics such as skeleton, breathing, coverings, teeth, and feet. In the animal world this includes Mammalian, Osteichthyes (ex. bony fish), Chondrichthyes (ex. sharks and rays), Reptilian (ex. alligators), Arthropod (ex. crabs), and Cnidarians (ex. coral).

Procedure:

1. Make a copy of the Classification Title Cards and a copy of the Animal Cards and place tape on the back of each card.
2. Hand out an animal card to each student. (If there are not enough animal cards you can hold up cards and place them in the category that the students call out.)
3. Hang Classification Title Cards up on a board. Start with Mammal, Fish, Reptile, etc... (You can keep the characteristics attached if you would like or take them off to challenge the students.) Then let students put the animal cards in the correct category.
4. Remove the Mammal, Reptile, etc... cards; then Hang up the Invertebrate and Vertebrate Cards and repeat with the animal cards.
5. Remove the Invertebrate and Vertebrate cards; then Hang up Cartilaginous and Bony Fish Cards and repeat with just the FISH animal cards.
6. This activity can be done in small groups or as a whole class; just make a set of Classification Title Cards and Animal Cards for each small group.

Assessment:

1. On a separate piece of a paper, have the students write down 5 more animals (that aren't on the cards) for each category of Mammal, Reptile, Arthropod, and Fish.

2. Have the students pick one of the animals from the animal cards and write a 1 to 2 page report on that animal, including where the animal lives, what it eats, adaptations, its conservation status and how they can help protect that animal.

Resources:

1. Gilopin, Daniel and Parker, Steve. 2006. *Animal Kingdom Classification Series*, Compass Point Books.
2. National Park Service. [Aliens in your neighborhood](http://www.nps.gov/invspcurr/alienXIDactivities.htm); 9/27/07;
<http://www.nps.gov/invspcurr/alienXIDactivities.htm>

Mammal

**Warm
Blooded**

Vertebrate

**Hair or
Fur on
Body**

**Mother gives milk
to offspring**

Arthropod

Cold Blooded

Invertebrate

**Segmented
bodies with
jointed limbs**

Fish

**Cold
Blooded**

Vertebrate

**Scales on
body**

**Gills for
breathing**

Reptile

**Cold
Blooded**

Vertebrate

**Scales on
body**

**Lungs for
breathing**

Cnidarian

**Radial
Symmetry**

Invertebrate

Stinging Cells

Bony Fish

Skeleton composed of Bone

Cartilaginous Fish

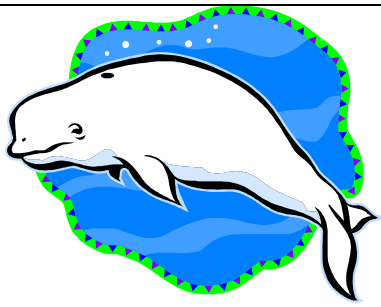
Skeleton composed of Cartilage

Invertebrate

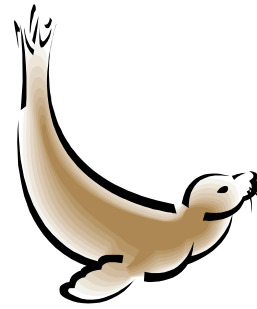
Animal without Backbone or Spinal Column

Vertebrate

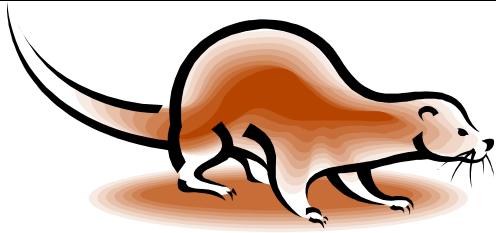
Animal with Backbone or Spinal Column



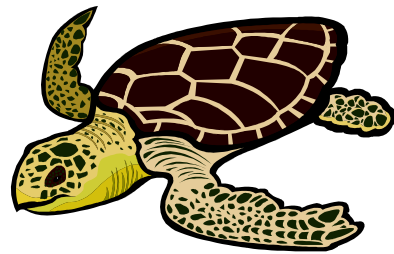
Beluga Whale



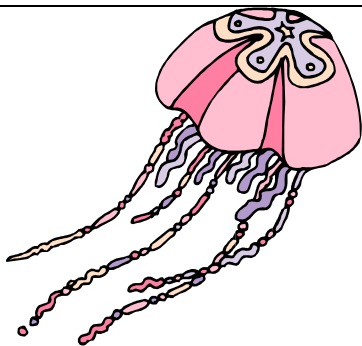
California Sea Lion



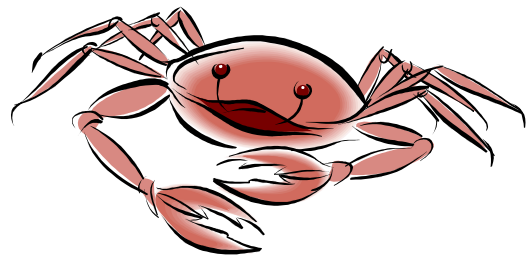
Asian Small Clawed Otter



Sea Turtle



Jelly



Japanese Spider Crab



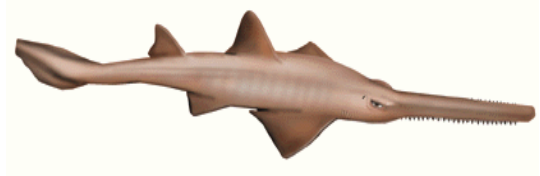
Weedy Sea Dragon



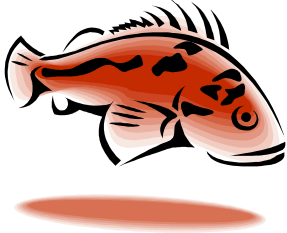
Coral



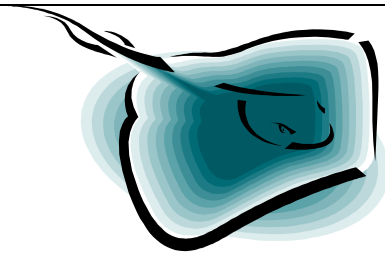
Moorish Idol



Sawfish



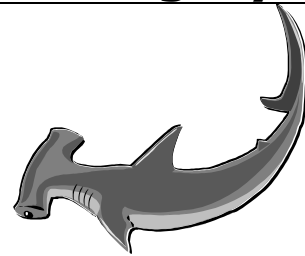
Grouper



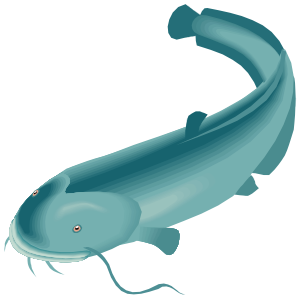
Stingray



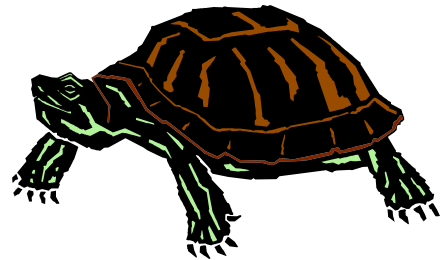
Zebra Shark



Hammerhead Shark



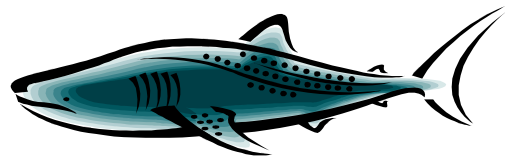
Catfish



Turtle



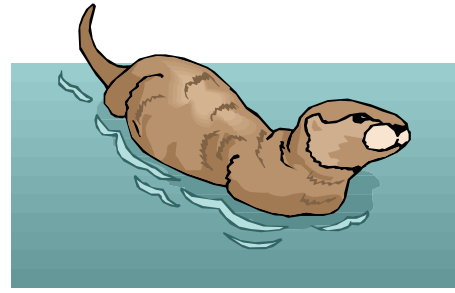
Alligator Gar



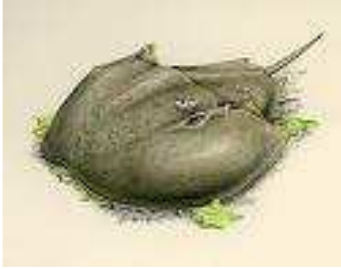
Whale Shark



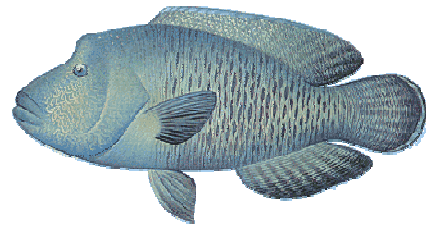
Sea Anemone



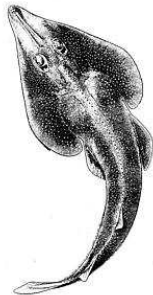
Sea Otter



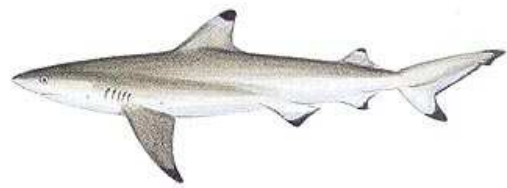
Horseshoe Crab



Humphead Wrasse



Guitarfish



Black tip reef shark

Classification Answer Key

<p>Fish:</p> <ul style="list-style-type: none"> • Zebra Shark • Whale Shark • Sawfish • Grouper • Stingray • Humphead Wrasse • Guitarfish • Black Tip Reef Shark • Catfish • Hammerhead Shark • Weedy Sea Dragon • Alligator Gar • Moorish Idol 	<p>Vertebrate:</p> <ul style="list-style-type: none"> • Zebra Shark • Whale Shark • Sawfish • Stingray • Grouper • Humphead Wrasse • Weedy Sea Dragon • Black Tip Reef Shark • Catfish • Alligator Gar • Hammerhead Shark • Sea Turtle • Turtle • Guitarfish • Sea Otter • Asian Small Clawed Otter • California Sea Otter • Beluga Whale • Moorish Idol
<p>Mammal:</p> <ul style="list-style-type: none"> • Beluga Whale • Asian Small Clawed Otter • Sea Otter • California Sea Lion 	<p>Invertebrate:</p> <ul style="list-style-type: none"> • Japanese Spider Crab • Coral • Jelly • Horseshoe Crab • Sea Anemone
<p>Arthropod:</p> <ul style="list-style-type: none"> • Japanese Spider Crab • Horseshoe Crab 	<p>Cartilaginous Fish:</p> <ul style="list-style-type: none"> • Zebra Shark • Whale Shark • Sawfish • Stingray • Guitarfish • Black Tip Reef Shark • Hammerhead Shark
<p>Reptile:</p> <ul style="list-style-type: none"> • Turtle • Sea Turtle 	<p>Bony Fish:</p> <ul style="list-style-type: none"> • Grouper • Catfish • Leafy Sea Dragon • Humphead Wrasse • Alligator Gar • Moorish Idol
<p>Cnidarian:</p> <ul style="list-style-type: none"> • Coral • Jelly • Sea Anemone 	

Aqua Adventure Teacher Survey

Please provide us with feedback about your recent educational experience on at the Georgia Aquarium. We appreciate your input in helping us create the world's most engaging aquarium experience! You may return this form (attn: Education Assessment) through mail (225 Baker St. Atlanta, GA 30313) or fax it to 404.581.4199. Thank you!

Name (optional): _____

School or organization name: _____

Grade level: _____ Date of visit: _____

Did you or someone from your school attend our teacher open house prior to your visit?

___ Yes- I attended ___ Yes- Someone from our school attended ___ No

1. How did you make your reservation? ___ online ___ calling
2. Were you the person who made the reservation? ___yes ___no

For the remaining items, check the corresponding box that best represents your opinion about your experience.

Please write a specific comment(s) at the end.

	Excellent	Good	Average	Below average	Very poor
Booking your reservation					
If you called, the knowledge of reservationists					
Price					
Educational value					
Ease of using the guide					
Overall experience					

3. Have you participated in a Georgia Aquarium Education Program before? **YES or NO**
If yes, which program _____ How did it compare (content, exhibits, reservations, etc...)?

4. Suggestions for improvement of the educational program.

5. Suggestions for improvement of the reservation process.

6. General comments to explain ratings from the box on the front.

**Thank you for taking the time to share your thoughts with us!
Your input enables us to create a more engaging experience for future guests!**