



**Education Dept.**  
Georgia Aquarium  
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# WEIRD & WILD

## TEACHERS GUIDE

### GRADES 3-5

#### Program Description:

Come along on a “weird & wild” adventure at the Georgia Aquarium! Throughout this program your students will explore aspects of the Tropical Diver, Ocean Voyager, and Coldwater Quest galleries to discover the “weird & wild” characteristics of different species. The students will also go behind the scenes while learning how these animals are able to survive in their habitats and how we can help protect and preserve the environment they live in.

#### Enduring Understandings for Weird & Wild:

- ◆ Scientists utilize a classification system to organize living things according to their characteristics.
- ◆ An animal’s conservation status is determined to create awareness, provide regulations, and protect that animal’s population.
- ◆ All organisms, whether they live in freshwater or marine ecosystems, have adaptations that allow them to survive in their natural habitats.
- ◆ Humans play an important role in maintaining healthy ecosystems and balancing natural processes.

#### 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.

#### Before coming to the aquarium, the student should:

- ◆ Have a conceptual understanding of freshwater and saltwater aquatic habitats and where to find them.
- ◆ Have a conceptual understanding of pollutants and their impact on aquatic systems.
- ◆ Have a working knowledge of the following vocabulary:
  - **Adaptation:** the changing over time of the structure, function, or behavior of an organism, which enables it to be better suited to its environment
  - **Arthropod:** an invertebrate animal covered with a hard exoskeleton and a segmented body with appendages on at least one section. These animals

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belong to the phylum Arthropoda, which includes insects, crustaceans, arachnids, and myriapods (e.g. centipedes and millipedes)

- **Camouflage**: an animal's ability to blend in with their surroundings
- **Cartilage**: a firm, elastic substance found in the bodies of humans and other animals
- **Classification**: the grouping of organisms into categories on the basis of evolutionary or structural relationships between them
- **Conservation**: the use of natural resources in a way that ensures their continuing availability to future generations; the wise and intelligent use or protection of natural resources
- **Coral Reef**: type of marine habitat found mostly in tropical regions
- **Fish**: a cold-blooded aquatic vertebrate that has gills, varied fins, and scales
- **Freshwater**: of, relating to, living in, or consisting of water that is not salty
- **Gills**: the respiratory organ for aquatic animals that breathe water to obtain oxygen
- **Habitat**: the area where an organism or ecological community normally lives
- **Invertebrate**: lacking a backbone or spinal column
- **Mammal**: a warm-blooded vertebrate characterized by hair, milk-producing mammary glands (for the females to nourish the young). These animals also give live birth (e.g. humans, whales, otters)
- **Pollution**: the contamination of soil, water, or the atmosphere by the release of harmful substances
- **Predator**: an organism that lives by preying on other organisms
- **Prey**: animals that are killed and eaten by other animals
- **Reptile**: a cold-blooded vertebrate with an external covering of scales or horny plates that breathes using its lungs. These animals usually lay eggs (e.g., snakes, lizards, crocodiles)
- **Saltwater**: relating to, consisting of, or containing salt water
- **Vertebrate**: having a backbone or spinal column
- **Watershed**: the region draining into a river, river system, or other body of water

### **Pre-visit activities:**

- 1) **Water Address** – Students will identify aquatic animals and their habitats by analyzing clues that describe the animals' adaptations.
- 2) **Awesome Aquatic Animals!** – Students will learn the parts of a fish, shark, and whale; and compare and contrast the differences and similarities of each animal.

### **Post-visit activities:**

- 1) **Classification Station** – Students will classify animals they saw at the Georgia Aquarium.
- 2) **Spotless School** – Students will participate in a school yard clean up and collect nonpoint source pollution.

## Georgia Performance Standards for 3<sup>rd</sup> Grade (Weird 'n Wild)

### Science

#### 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
- 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.

## Georgia Performance Standards for 4<sup>th</sup> Grade (Weird 'n Wild)

### Science

#### 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.

- 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.

## **Georgia Performance Standards for 5<sup>th</sup> Grade (Weird 'n Wild)**

### Science

#### 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).

# Water Address (Pre-Visit Activity)

**Grade:** 3<sup>rd</sup> – 5<sup>th</sup>

**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. Have 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 protects itself, as well as other ways it is able to survive successfully in its habitat. They can evaluate each others work and offer suggestions.

**Resources:**

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

Adaptation Card

- ◆ 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.

*Answer: Octopus - coral reef*

Adaptation Card

- ◆ 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.

*Answer: Catfish - river*

Adaptation Card

- ◆ 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 flippers into my shell.
- ◆ I like to rest underneath rock ledges (which also protect me).

*Answer: Sea turtle - open ocean, coral reef*

Adaptation Card

- ◆ 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.

*Answer: Crocodile - swamp*

Adaptation Card

- ◆ 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.

*Answer: Tropical fish - coral reef*

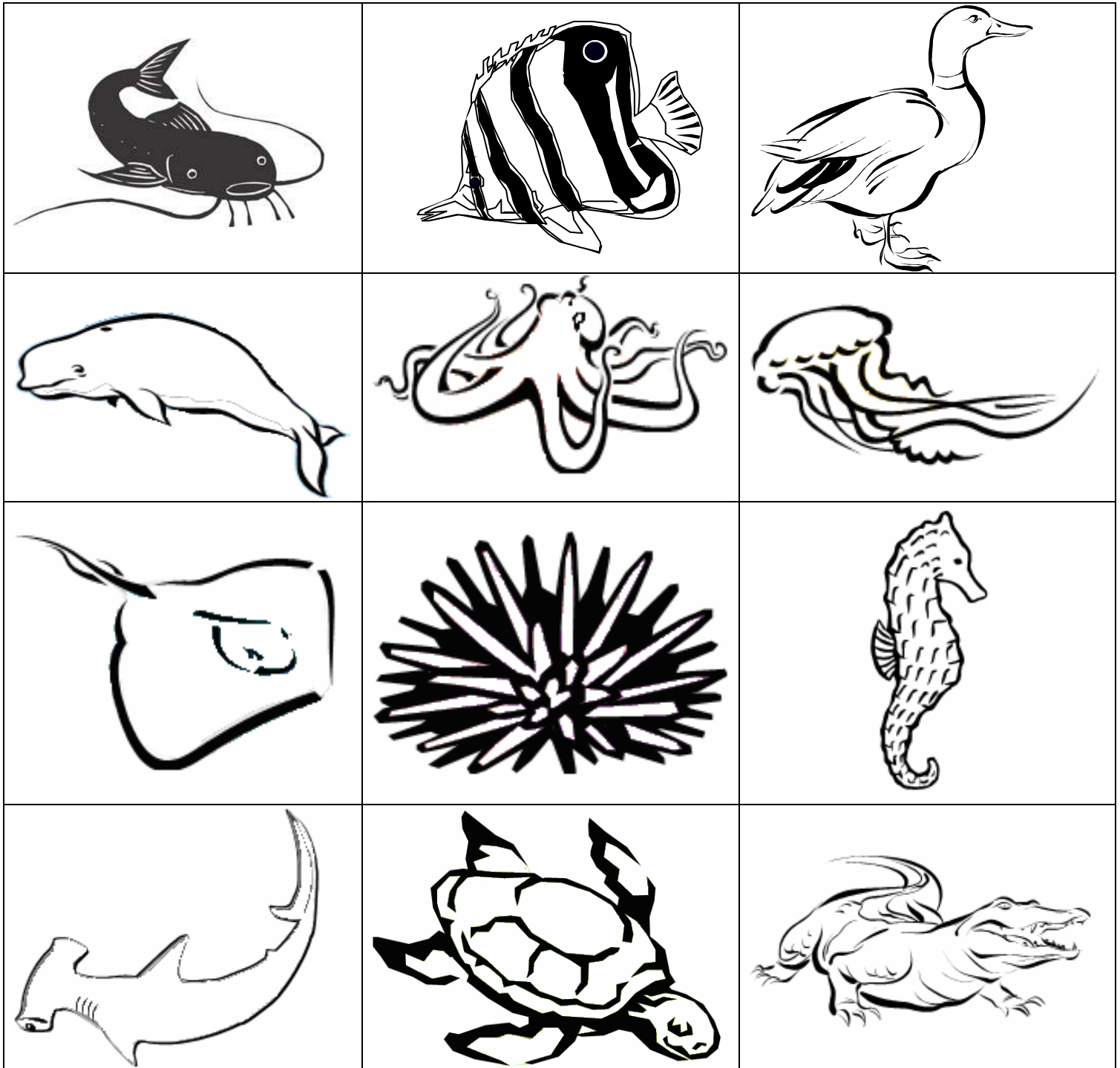
Adaptation Card

- ◆ 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 lying 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.

*Answer- Cownose ray - open ocean*

<p>Adaptation Card</p> <ul style="list-style-type: none"> <li>◆ I have webbed feet.</li> <li>◆ I have glands that produce a waxy oil that waterproofs my feathers.</li> <li>◆ I have a wide, flat beak adapted for scraping the bottom of my habitat for food.</li> <li>◆ I migrate to warmer areas in the winter for food and shelter.</li> </ul> <p><i>Answer: Duck - marsh, river</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> <li>◆ I move with the movement of the waves.</li> <li>◆ I have stinging tentacles that help me catch my food.</li> <li>◆ Being clear makes it hard for predators to see me.</li> <li>◆ I have special “arms” that bring my food up to my “mouth”.</li> </ul> <p><i>Answer: Jelly- open ocean and/or coral reef</i></p>
<p>Adaptation Card</p> <ul style="list-style-type: none"> <li>◆ I move using hundreds of tiny tube feet all over my body.</li> <li>◆ I have spines all over my body for protection.</li> <li>◆ My color helps me to camouflage in my environment.</li> <li>◆ I also use my spines to dig into stones to hide.</li> </ul> <p><i>Answer: Sea urchin - coral reef</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> <li>◆ My light color helps me to camouflage in my habitat.</li> <li>◆ Blubber helps keep my body heat inside.</li> <li>◆ My teeth and flexible lips help me to eat animals off the ocean bottom.</li> <li>◆ I can hold my breath for 20-25 minutes!</li> </ul> <p><i>Answer: Beluga whale - in the arctic (ocean)</i></p>
<p>Adaptation Card</p> <ul style="list-style-type: none"> <li>◆ I am a fish that breathes with gills.</li> <li>◆ I use my long snout to suck up tiny shrimp.</li> <li>◆ I have fins for swimming located on my lower body and my head</li> <li>◆ I give live birth from a pouch (males only!).</li> </ul> <p><i>Answer: Seahorse - coral reef</i></p>	<p>Adaptation Card</p> <ul style="list-style-type: none"> <li>◆ I have gills that I use for breathing.</li> <li>◆ I use my sharp teeth for catching and eating stingrays and other fish.</li> <li>◆ The strange shape of my head helps me to maneuver through the water.</li> <li>◆ My skin is made of tiny teeth that help to protect me.</li> </ul> <p><i>Answer: Hammerhead shark - open ocean, coral reef</i></p>

# ANIMAL CARDS



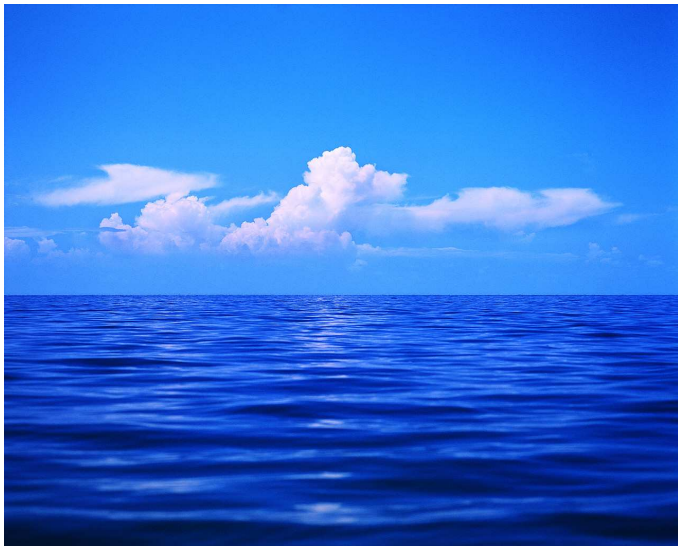
# HABITAT CARDS



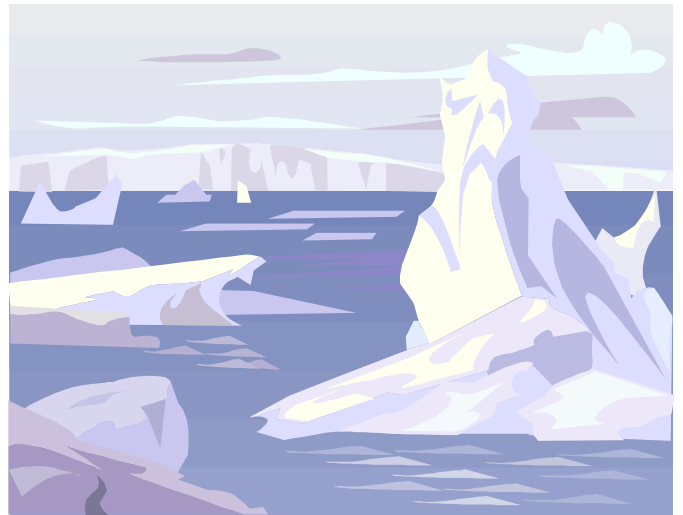
**CORAL REEF**



**RIVER**



**OPEN OCEAN**



**ARCTIC**



**MARSH**



**SWAMP**

# Awesome Aquatic Animals! (Pre-Visit activity)

**Grade:** 3<sup>rd</sup> – 5<sup>th</sup>

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

**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 nose. 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 forward, 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, that 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 tails, or **flukes**, up and down to swim instead of side-to-side like a fish. Like fish, whales also use their **pectoral flippers** to stop, move forwards, or turn. However, unlike fish, whales also use their flippers 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, used 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, 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:**

- ◆ 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 animal would use those parts to survive in its environment. Supplies can 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." 8/19/07  
<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

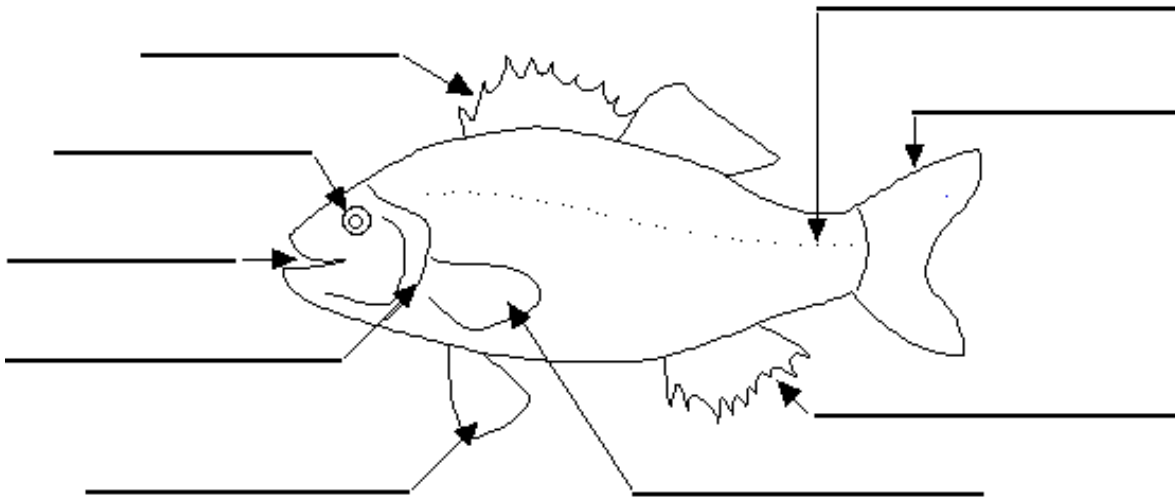
**gills** - fleshy organs that are used for breathing - they are located on the side of the head

**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

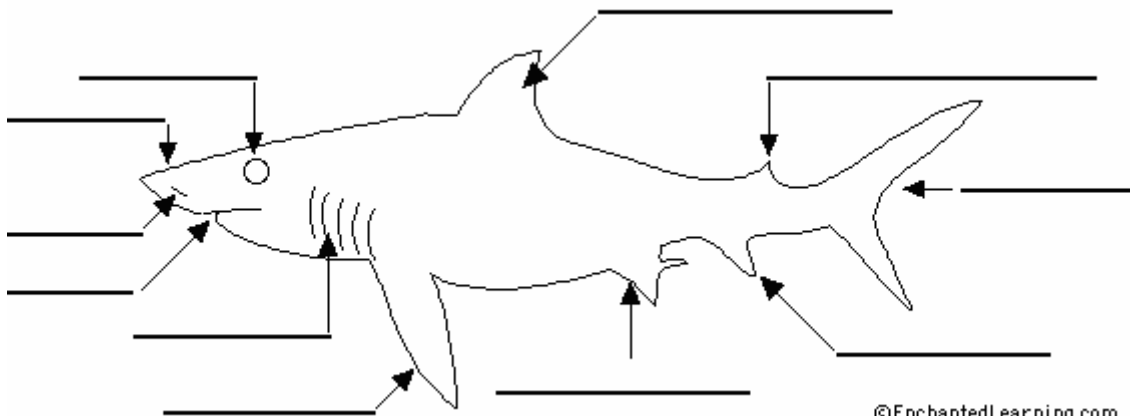
**nostril** - paired slits on the underside of the snout. Water continually flows through the nostrils, giving the shark olfactory (sense of smell) information. Unlike humans, shark nostrils have nothing to do with breathing - they are not even connected to the mouth.

**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



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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 whales breathe air through

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

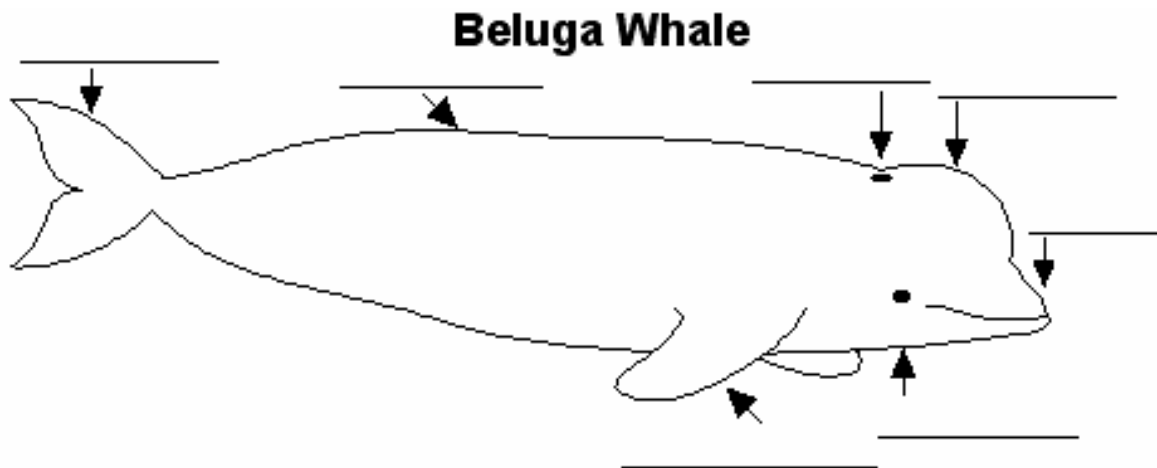
**eye** - sight organs located on the head

**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

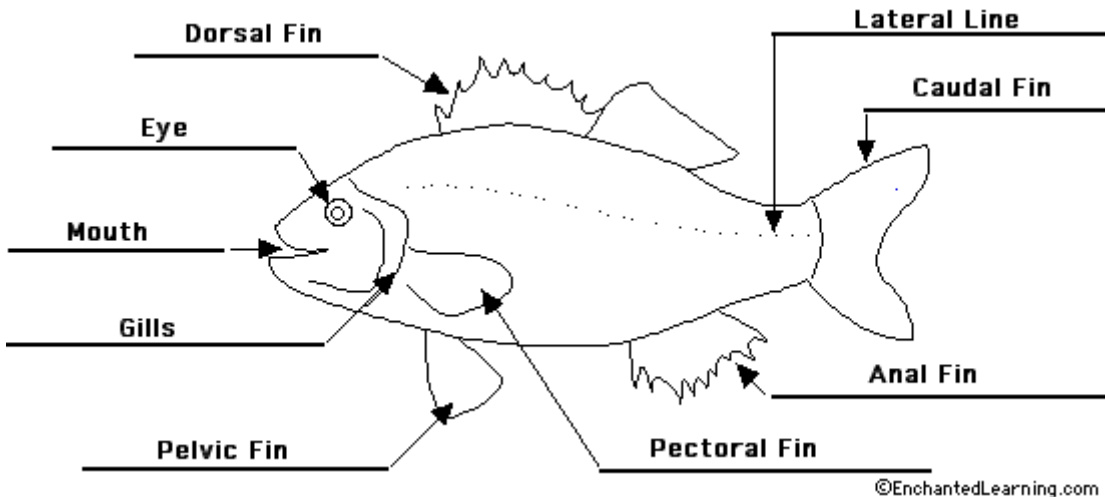
**gills** - fleshy organs that are used for breathing - they are located on the side of the head

**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.)

**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

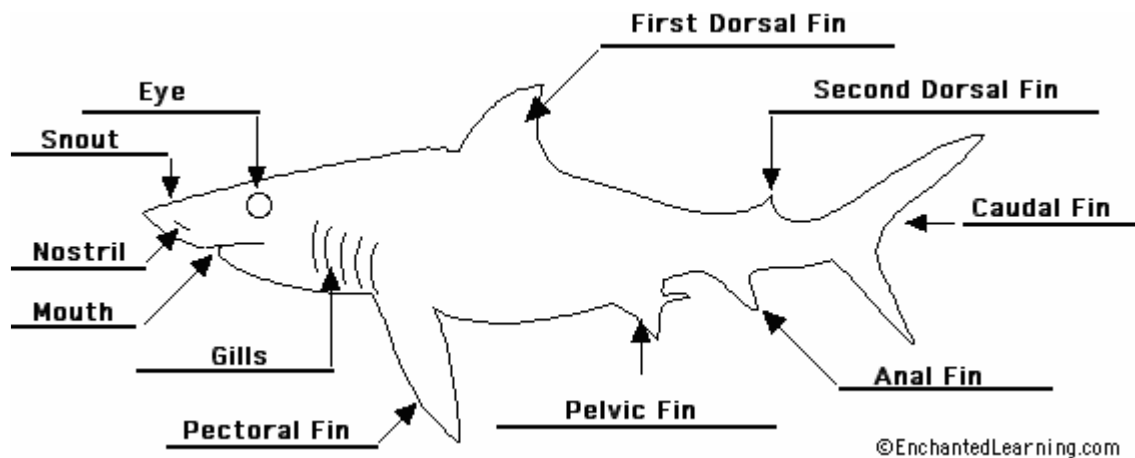
**nostril** - paired slits on the underside of the snout. Water continually flows through the nostrils, giving the shark olfactory (sense of smell) information. Unlike humans, shark nostrils have nothing to do with breathing - they are not even connected to the mouth.

**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



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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.)

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

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

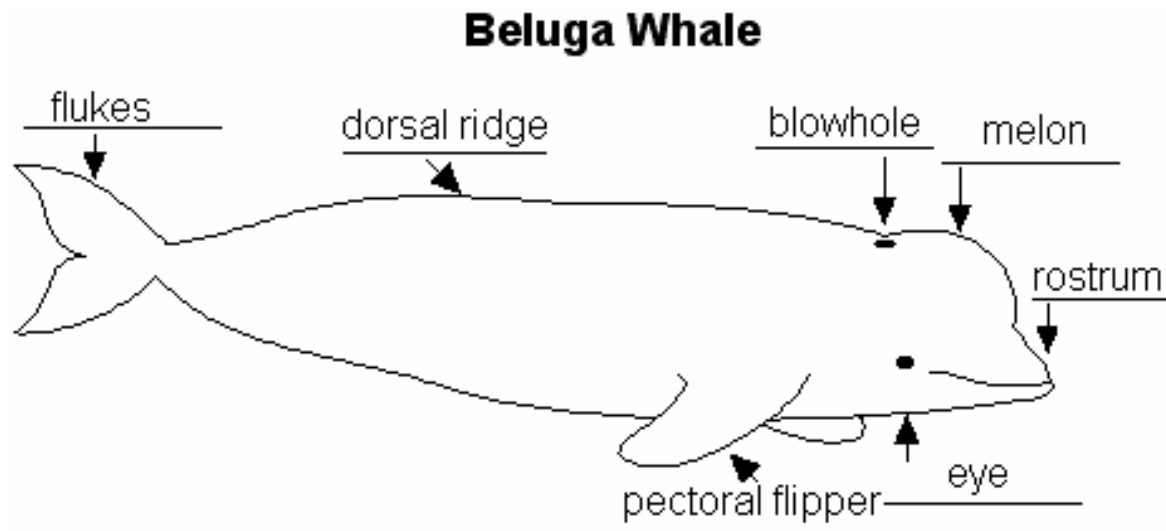
**eye** - sight organs located on the head

**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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# Classification Station! (Post-Visit activity)

**Grade Level:** 3<sup>rd</sup>– 5<sup>th</sup>

**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:

- ◆ 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.
- ◆ 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, its adaptations, its conservation status and how they can help protect that animal.

## Resources:

Gilpin, Daniel and Parker, Steve. 2006. *Animal Kingdom Classification Series*, Compass Point Books.

National Park Service. [Aliens in your neighborhood](http://www.nps.gov/invspcurr/alienXIDactivities.htm); 9/27/07;  
<http://www.nps.gov/invspcurr/alienXIDactivities.htm>

**Classification Title Cards**

# **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**

# **Vertebrate**

Animal with backbone or spinal column

# **Invertebrate**

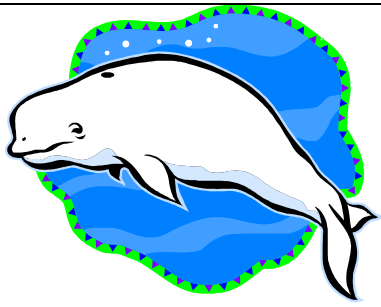
Animal without a backbone or spinal column

# **Bony Fish**

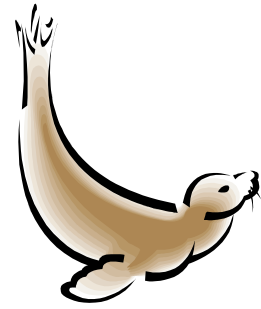
Skeleton composed of bone

# **Cartilaginous Fish**

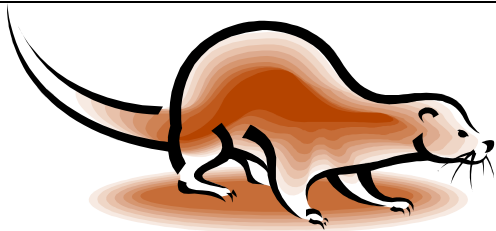
Skeleton composed of cartilage



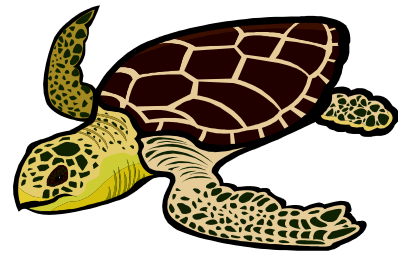
**Beluga Whale**



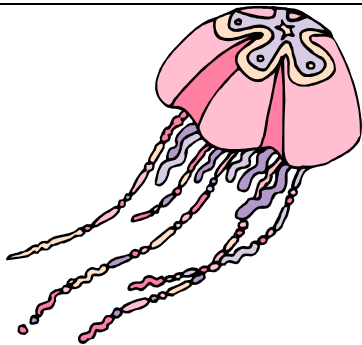
**California Sea Lion**



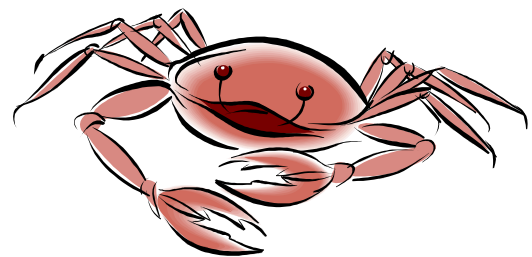
**Asian Small Clawed Otter**



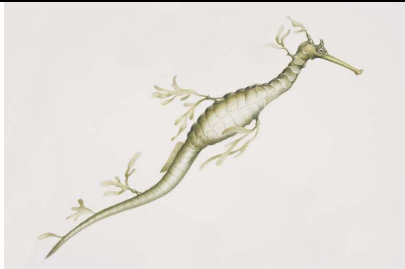
**Sea Turtle**



**Jelly**



**Japanese Spider Crab**



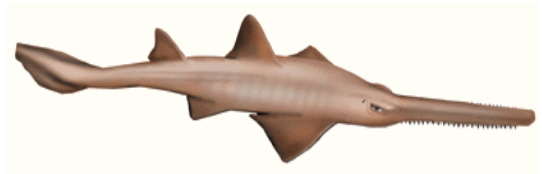
**Weedy Sea Dragon**



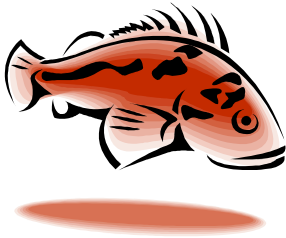
**Coral**



**Moorish Idol**



**Sawfish**



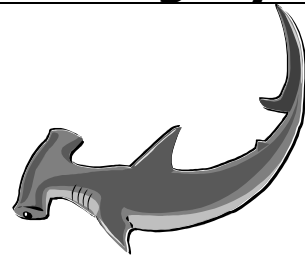
**Grouper**



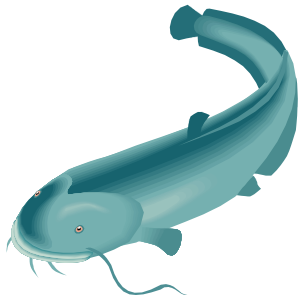
**Stingray**



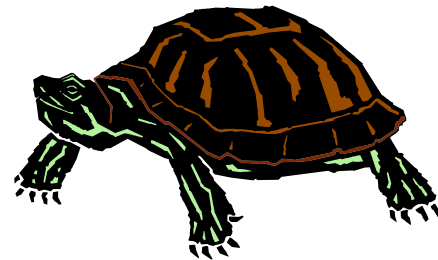
**Zebra Shark**



**Hammerhead Shark**



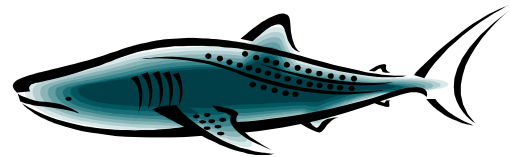
**Catfish**



**Turtle**



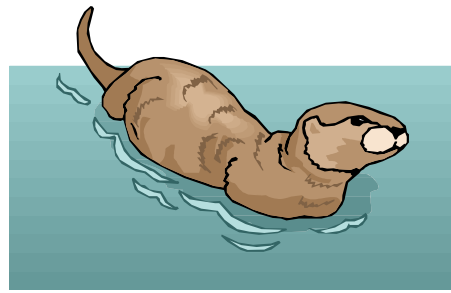
**Alligator Gar**



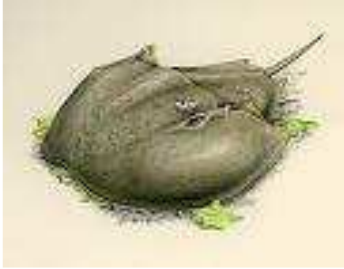
**Whale Shark**



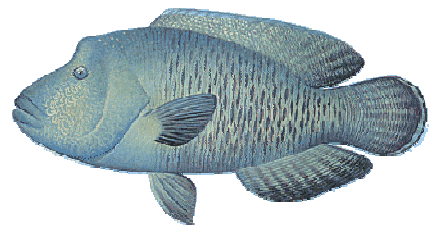
**Sea Anemone**



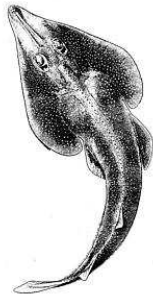
**Sea Otter**



**Horseshoe Crab**



**Humphead Wrasse**



**Guitarfish**



**Black tip reef shark**

## Classification Answer Key

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

# Spotless School (Post-Visit activity)

**Grade Level:** 3<sup>rd</sup> – 5<sup>th</sup>

**Duration:** 45 minutes

**Objective:** Students will conduct a schoolyard clean-up gathering nonpoint source pollution.

## Materials:

- Plastic bags
- Pencil
- Data sheet
- gloves

## Background:

Pollution is an alteration of the physical, chemical, or biological properties of water by the introduction of any substance that renders the water harmful to use. There are two types of pollution: point source and nonpoint source pollution. *Point source pollution* occurs when pollutants are discharged from any identifiable point, such as factories and water treatment plants. They enter the water body usually through a pipe and are controlled by permits and the Clean Water Act. *Nonpoint source pollution* is contamination that does not originate from one specific location, and comes from everywhere. Nonpoint source pollution is commonly found on school grounds. This type of pollution often is carried across land by water when it rains and then dumped into bodies of water. All types of pollution can impact the health of fish and aquatic organisms. Schoolyard clean-ups are a great way to improve water quality by removing pollution that may end up in the nearest body of water.

## Procedure:

1. Ask the students “What is pollution?”
2. Ask them for examples of pollution and write them on the board (if they don’t mention any point source pollution, add them to the list).
3. Ask students the difference between point source pollution and nonpoint source pollution. Help students categorize the list on board as either point source pollution or nonpoint source pollution.
4. Ask the students which type of pollution is the hardest to control? (nonpoint source pollution). Tell them point source pollution is controlled by permits and the Clean Water Act.
5. Divide students into teams of three or four and give them a bag, pencil, and a data sheet.
6. Conduct a school yard clean up. If you have access and permission, a waterway clean up can be done there as well.
7. Tell students one person on each team is responsible for recording the type of trash found on the data sheet as they walk around the school yard picking up trash.
8. Review safety rules.
9. Take the students around the school campus including the front entrance, playground and any other location that may have pollution.

10. After half an hour (or longer if you wish), gather all the plastic bags, and take them back to the classroom.
11. Have students tally their data sheet and analyze the data (Did they find more of one type of trash?).
12. Have students share how they feel after the activity, how they feel looking at the trash and what they can do to help reduce pollution.

**Assessment:**

- ◆ Have students brainstorm ways they can contribute to minimizing pollution on the school campus. Create a document and present it to the appropriate person on school staff.
- ◆ Students can create various types of graphs representing the data collected during the clean-up.
- ◆ Students can reflect on their clean-up activity by writing a journal entry.

**Extension:**

- ◆ Students will participate in a river clean-up with a local organization, such as “Rivers Alive” or “Keep Georgia Beautiful.”

**Resources:**

EPA. Polluted Runoff; 12/08/05; <<http://www.epa.gov/owow/nps/kids/>>.

The Earth Works Group. 1990. 50 Simple Things Kids Can Do To Save The Earth. New York, Scholastic, Inc.

# Data Collection

Names: \_\_\_\_\_

Date: \_\_\_\_\_

Type of Pollution	Number
Bags	
Paper	
Balloons	
Plastic Bottles	
Glass Bottles	
Aluminum Cans	
Bottle Caps and Lids	
Clothing and Shoes	
Cups/Plates/Silverware	
Food Wrappers/Containers	
Straws	
Toys	
Styrofoam	
Other	

Most common item collected: \_\_\_\_\_

Most unusual item collected: \_\_\_\_\_

Did you enjoy cleaning up your school ground? \_\_\_\_\_

Number of bags collected as a class: \_\_\_\_\_

Three ways I can reduce pollution at school:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_