



how to read a fish... and be a fish detective

How to Utilize this Packet

This worksheet packet is designed to help students understand what adaptations are and how these adaptations determine the various life history traits and characteristics of fish, invertebrates, amphibians, and reptiles. It is designed to be used in conjunction with our classroom program, How to Be a Fish Detective. The program and worksheets focus on animal adaptations.

An adaptation is a design of or change in structure, form, or function that allows an animal or plant to better survive in its environment. Aquatic animals have developed many unique adaptations to ensure their survival in different underwater environments. Some of these adaptations help fish find food while others help prevent fish from becoming food. There are adaptations which help fish swim and some that allow fish to walk on land. Some adaptations determine whether a fish lives in fresh, salt, or brackish water, as well as determine whether the fish lives in shallow or deep water. There are even adaptations that allow some fish to be inactive during the day and become active at night.

This packet contains six worksheets, each with an activity and some have background information to assist the student.

Worksheet #1:

I Wonder... is to be completed before your visit to the National Aquarium. It consists of a variety of different blanks all starting with the phrase "I wonder." Have the students fill out as many questions as they can and then instruct them to try and answer these questions during their visit. Keep in mind that the open format of this worksheet may allow for questions that cannot be answered during their visit. We do not, for example, have any dolphins or whales. It is not likely that specific information regarding these animals will be discovered here at the National Aquarium in Washington, DC. Any unanswered questions may be assigned as extra credit and researched at the library after their visit.

Worksheet #2:

Body Form and Function consists of a series of tasks that allow your students to discover various aspects of fish form and function. These characteristics are related to various swimming modes and habitats. An exercise is included at the end of this worksheet that asks the students to write a short essay on a fish of their choice that they saw at the National Aquarium.

Worksheet #3:

Coloration and Venom focuses on body coloration and it acts as both camouflage and warning signs.

Worksheet #4:

Feeding Habits focuses on those adaptations that determine what fish eat as well as how they eat. This worksheet should be related back to the student's own personal lives by having them think about the foods they eat, as well as how they eat these items.

Worksheet #5:

Ready to Read A Fish is a review of all the information the students have just learned. They are assigned to go through the Aquarium and choose their favorite fish. They are to discover various clues and answer a few questions about their fish. Afterwards, they are to write a short essay detailing various life history traits of their animal.

I Wonder...

worksheet #1: how to read a fish and be a fish detective

I Wonder...

Instructions: Finish the sentences with questions you have about the Aquarium. Try to look and listen for the answers during your visit. Remember that you do not have to fill in all of the blanks.

I wonder _____

I wonder _____

I wonder _____

I wonder _____

I wonder _____

I wonder _____

I wonder _____



Body Form and Function

worksheet #2: how to read a fish and be a fish detective

Body Form and Function

Body shapes allow aquatic animals to swim fast or slow, to mimic their surroundings, and to protect themselves. Fish live in a variety of aquatic habitats such as oceans, rivers, swamps, streams, and ponds. Each habitat dictates the body type the animal needs to survive within the habitat.

Fish Shapes

Bullet shaped – These fish are streamlined like a bullet for less resistance against water. With less resistance these animals are able to reach fast speeds. Pelagic (open water) fish and sharks often have this body design. This body type is also called fusiform.

Compressed – These fish are flattened from side to side. Being thin allows the animal to hide within rocks and corals. They also seem to vanish when they turn sideways. Examples include filefish and angelfish.

Depressed – These fish are flattened from top to bottom. The flat shape, along with special coloration, allows these fish to blend in with the bottom. Flat fish are able to hide from predators while able to sneak up on prey. Examples include flounder, rays, and skates.

Inflatable fish – Puffers and porcupinefish can swallow water to inflate their bodies. This serves as a defense mechanism in cases where the animal feels threatened. If taken out of the water they can also swallow air.

1. Find a fish that can blow itself up with air for protection. _____
2. Find a fish that is easy to see from the side, but not so easy to see from the front. _____
3. Find a fish with a snake-like body. _____
4. Find a fish that is shaped like a bullet. _____
5. Find a fish that is flat and lies on the bottom. _____
6. Find an animal that looks like a rock. _____

Pick a fish from above. Why do you think it is shaped the way it is? Do you think it is suited to its environment? Why or why not?



Coloration and Venom

worksheet #3: how to read a fish and be a fish detective

Coloration and Venom

Fish come in a variety of colors and use their coloration in different ways. Generally, freshwater and pelagic fish are duller in coloration because the rivers, lakes, and ocean waters where they live are not as brilliantly colored as coral reefs. Reef fish come in every color of the rainbow to blend in with their environment.

Brightly colored – These fish can blend into the background of a coral reef, which in clear water and strong sunlight is often brightly colored. Sometimes they can be sending a message to its predators that it is dangerous. A good example of this is the lionfish that has spines and is venomous.

Dull colored – These fish can blend into swamps, rivers, and streams so as not to be easily seen by predators. They are also good at ambushing their prey.

Camouflage – Many fish have evolved elaborate means of camouflage including modification of body shape, color, pattern and behavior. Camouflage allows a fish to blend into the background where they usually swim or rest. Striped fish often swim in areas where there are grass-like weeds. Spotted fish can blend with coral, gravel or rocks. Other fish can change color to match the color of the surface they are lying on. Mimicry is a type of camouflage in which the animal takes the shape or color of other objects found in the water.

Eyespots – Some fish have a black spot on their tail that looks like an eye. These fake eyes are called “eyespot.” Having an eyespot on the tail may make a predator think that the tail is the head. The predator will chase the tail giving the fish a better chance of getting away.

1. Find a fish with a stripe that covers its eye. _____
2. Find a fish that is brightly colored. _____
3. Find a fish that is dull-colored. _____
4. Find a fish that uses camouflage for protection. _____
5. Find a fish that is venomous. _____
6. Can you find a fish that is brightly colored and is venomous? _____

7. Find a fish with spots. _____
8. Find a fish that has stripes. _____
9. Find a fish that lives on a coral reef. What color is it? _____
10. Find a fish that lives in a pond, lake, stream, or river. What color is it? _____
11. What color difference is there between the reef fish and the freshwater fish? Why? _____

Pick a fish from above. Why do you think it is that color? Does it have an eyespot? If yes, why? Is it venomous? Do you think its color helps it hide from predators? If yes, how? Or, do you think its color helps it sneak up on prey? If yes, how?





Eating Habits

worksheet #4: how to read a fish and be a fish detective

Eating Habits

The shape and size of a fish's mouth will give you clues about what it eats and where it searches for food.

What Do I Eat?

Large mouth – for eating larger prey items

Small mouth – for eating small animals and/or plants

Tube-shaped mouth – for sucking up tiny animals and plants (plankton)

Sharp teeth – for eating meat

Flat teeth – for eating plants or crushing hard shells

Where Do I Eat?

At the surface – A fish with a mouth pointing toward the surface of the water catches food at or near the surface.

At the bottom – A fish with a mouth located on the bottom of its head feeds on food from the bottom. Catfish have whiskers, called barbels, around their mouths to help them find food on the bottom and hidden in the sand and gravel.

In the middle – Fish with mouths located in the middle of their head will catch their food between the surface and the bottom.

1. Find a fish with a mouth at the bottom. Where do you think it eats? _____

2. Find a fish with a mouth that faces straight ahead. Where do you think it eats? _____

3. Find a fish with a tube shaped mouth. What do you think it eats? _____

4. Find a freshwater fish that has sharp teeth. _____

5. Find a fish that eats marine grass or algae. _____

6. Find a saltwater fish that has sharp teeth. _____

7. Find a fish with barbells (whisker like projections around the mouth). _____

What do you think would happen if all fish had the same diet? Pick a fish from above. Where do you think it finds its food? Why? What do you think it eats? Why? Do you think anything eats it? Why or why not?



Ready to Read a Fish

worksheet #5: how to read a fish and be a fish detective

Ready to Read a Fish

Now it is time to put together everything you learned and be a **fish detective**. To be a good detective you need to find clues. To find the clues, use your observational skills and read a fish. Pick any fish in the Aquarium. Your job is to find out as much information as possible by just looking at the fish and observing it.

1. What does its shape tell you? Does it hide, or is it a chaser? Does it mimic something or use camouflage?

2. What does its color tell you? Is it brightly colored? Do you think it lives in a river or lake? Does it live in the ocean or on a reef? Does it use camouflage? How?

3. What does its mouth tell you? Where does it eat? Can you tell what it eats?

4. What else can you tell by looking at it?
