

Can You Judge a Fish by its Cover?

Adaptations of Fishes of the Chesapeake Bay

Grade Level: 7

Subject Area: Life Science

Virginia Standards of Learning: LS.9, LS.10, LS.14

Objectives:

Students will:

- Investigate adaptations that enable organisms to survive within their habitat
- Examine fishes of the Chesapeake Bay and identify their specific adaptations
- Understand how the adaptations of a fish relate to its life history, habitat, and niche

Summary:

Students will examine different species of fish found in the Chesapeake Bay and use a chart to help them determine the specific adaptations the fishes have. Students will relate the adaptations to the fishes' life histories, habitats, and niches.

Vocabulary: adaptation, niche, countershading

Materials:

For each group you will need (designed for 5 groups of 2-5 students):

- 1 dissecting tray
- 1 pair of forceps (optional)
- 1 hand held magnifying glass (optional)
- 1 copy of the *Adaptations Chart* (included; hard and electronic form)
- 1 Vis-à-vis marker (to write on laminated chart) or 1 pencil (to write on paper chart)
- 1 or 2 species of fish found in the Chesapeake Bay

Procedure:

Introduction

1. Discuss adaptations and different adaptations that fishes have. You can use the PowerPoint provided on the included thumbdrive for this discussion. This PowerPoint directly ties into the *Adaptations Chart* used in this activity.

2. Discuss respectful handling of the fishes with the students before they begin. They can touch and feel the fishes as much as they want, but they should not poke, stab, or squeeze them. The fishes are delicate and may need to be used for other classes. The fishes should be treated with respect – they were once living organisms and it is a unique experience to get to investigate them.

Activity

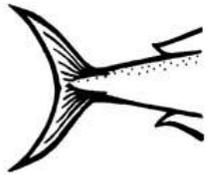
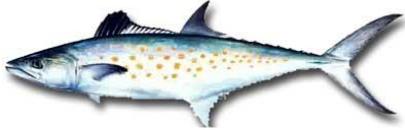
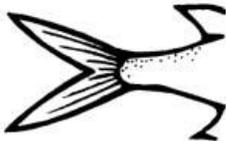
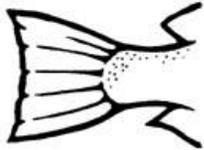
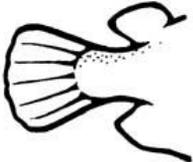
1. Students will use the *Adaptations Chart* to determine the specific adaptations their fish has and how it uses those adaptations to fill its niche. There are four main questions the students should answer. Each question is addressed on one page of the *Adaptations Chart*. The questions are:
 - a. How fast does your fish swim? Look at the tail to answer.
 - b. Where does your fish find its food? Look at the mouth to answer.
 - c. What does your fish eat? Look at the teeth to answer.
 - d. How does your fish defend itself? Look at various aspects of the fish to answer.Students may need to open the mouth of the fish and feel the teeth, feel along the fins to look for spines, feel the body of the fish, etc. to figure out the answers to the questions.
2. Once students have answered a question about their fish, they should use the marker or pencil to circle the adaptation their fish has on the *Adaptations Chart*.
3. When all groups have completed the four questions, each group should present to the rest of the class about their fish. They can stand up, hold their fish up, and tell the class about the adaptations their fish has and how fast it swims, what it eats, and how it defends itself as a result of those adaptations.

Wrap Up

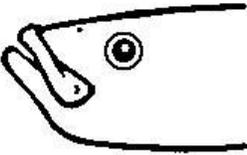
As the students present their fish to the rest of the class, make sure they emphasize the specific adaptation their fish has (lunate tail, sharp teeth, spines, etc.) and how that adaptation relates to its lifestyle and the niche it fills in the ecosystem. For example: A fish with sharp teeth likely eats other fishes. Therefore, it is a predator in the Chesapeake Bay. A fish with a down-turned mouth eats prey that is found below it or on the bottom. Therefore, this fish likely fills the niche of a bottom feeder.

Discuss the diversity of fishes and fish characteristics that are found in the Chesapeake Bay. Some fishes eat food on the bottom, some eat food in front of them in the water column, some fishes are filter feeders and eat plankton, some fishes eat other fish, some fishes swim fast, some swim slow. Fishes have a very diverse way of protecting themselves from predators as well. Diversity in species and adaptations results in a very complex ecosystem – every organism has its role or niche to fill. Remind students that they can tell a lot about an organism by simply looking at its characteristics or adaptations, and that organisms develop specific adaptations to fill a niche in their ecosystem.

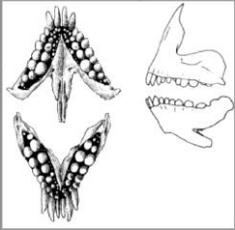
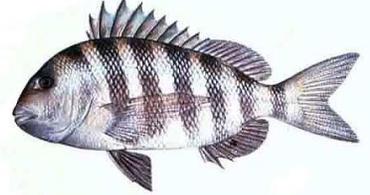
How Fast Does Your Fish Swim?

Tail Fin Shape	Picture of Fin	Example of Fish found in Chesapeake Bay	Swimming Speed
Lunate		 Spanish Mackerel	Very Fast
Forked		 American Shad	Fast
Squared		 Red Drum	Medium
Rounded		 Mummichog	Slow
Tapered		 American eel	Slow

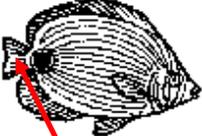
Where Does Your Fish Find Its Food?

Mouth Position	Picture of Mouth	Example of Fish found in Chesapeake Bay	Feeding Ability
<p>Located at end of head; pointing straight forward</p>		 <p style="text-align: center;">Striped Bass</p>	<p>Eats prey that is directly in front of it</p>
<p>Upturned or located on top of head</p>		 <p style="text-align: center;">Northern Stargazer</p>	<p>Eats prey that is above it</p>
<p>Downturned or located on bottom of head</p>		 <p style="text-align: center;">Spot</p>	<p>Eats prey that is below it</p>

What Does Your Fish Eat?

Type of Teeth	Picture of Teeth	Example of Fish found in Chesapeake Bay	Prey Item
Sharp teeth		 <p style="text-align: center;">Spotted seatrout</p>	Other fishes or soft bodied organisms
Blunt teeth, like molars		 <p style="text-align: center;">Sheepshead</p>	Hard bodied organisms, such as crabs, clams, oysters, and mussels
Teeth look like a beak		 <p style="text-align: center;">Northern puffer</p>	Hard bodied organisms or pieces of seaweed and coral
No teeth, maybe has big gill rakers	 <p style="text-align: center;">Gill Rakers</p>	 <p style="text-align: center;">Menhaden</p>	Plankton, either zooplankton or phytoplankton
Suction		 <p style="text-align: center;">Atlantic Sturgeon</p>	Often feed on organisms that live on the bottom, such as crabs, clams, and worms

How Does Your Fish Defend Itself?

Type of Defense	Examples of Defense	Example of Fish found in Chesapeake Bay	Advantage
Blend In	  Countershading Camouflage	 Summer Flounder	Countershading allows fish to blend in to their surroundings regardless of the angle they are being viewed at; Camouflage allows fish to hide from predators
Hide		 Feather blenny	Allows fish to hide from predators, especially fish that are not fast or strong swimmers
Spines		 White perch	Discourages predators from biting down
Unique coloring	  stripes Eyespot	 Spadefish	Unique coloring breaks up the outline of the fish in the water, making it difficult for predators to see; Eyespots confuse predators and draw attention away from the head of the fish
Other	There are lots of other types of defenses that fishes use. Your fish may have some that are not listed here. Take a good look and imagine how your fish avoids being eaten.	 Northern puffer	Other defenses include: advertising with bright colors and spines that a fish is poisonous, “puffing up” to make a fish appear bigger, or simply being fast and able to swim faster than a predator.

