Fish Clues

Grade Level: Elementary
Subject Areas: Life science, environmental science
Duration: 45 minutes

Next Generation Science Standards:

- 2-LS4-1 – Make observations of plants and animals to compare the diversity of life in different habitats.
- 3-LS3-2 – Use evidence to support the explanation that traits can be influenced by the environment.
- 3-LS4-3 – Construct an argument with evidence that in a particular environment, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-LS1-1 – Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.
    - Practices of science
        - Constructing explanations
    - Cross cutting concepts
        - Structure and function

Objectives:

- Students will understand that the anatomical shape of a fish's body, fins, mouth, and so on, is related to the function of that part.
- Students will be able to look at a fish and make deductions concerning its habitat, diet and possible predator/prey relationships.
- Students will have basic information about several species of sunfish

Teacher Background:

This would be a great introduction to "Sunfish and Students" and should be done before the students have studied or know anything about sunfish.

A basic principle of biology is that "form follows function"; in other words, the anatomy of an animal, both internal and external, is related to its behavior. Nowhere is this better illustrated than in fish. Fish come in all sizes, shapes and colors, but this variety is not random. Fish live virtually anywhere there is water, whether it is a clear, fast moving stream, a quiet, weedy pond, or the open waters of the Chesapeake Bay. Some fish are predators, some are prey, and many are both. The shape of the body, the location and shape of the fins, the location of the mouth, the color – all help determine where the fish lives, what it eats and how it protects itself.

Materials:

- Fish cards
  - Make enough copies for each student to have one
  - Cut the cards apart; you might want to laminate them so they can be used again
- Fish Adaptations – one copy per student
- Fish External Anatomy diagram (if students haven't previously studied fish anatomy) – to save paper you might want to make an overhead of this page.

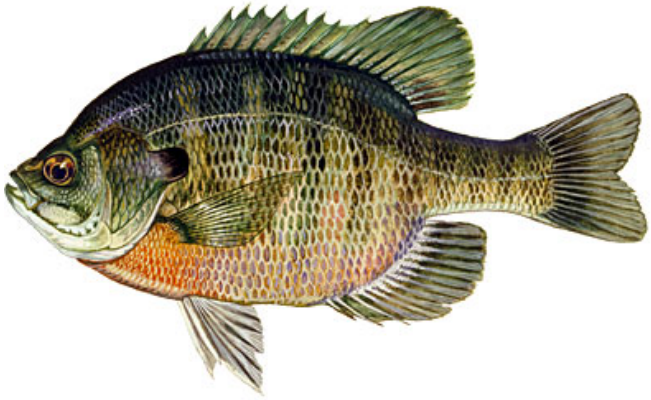
Activity:

- Engage
  - Write the words "Form follows function" on the board and ask the students if they know what it means. Have them try to come up with a working definition.
  - If they are having trouble, try using the example of birds' feet. Why do ducks and hawks have different shaped feet? What do the feet tell them about the bird?
- Explore
  - Tell them that they are going to use their powers of observation and deductive reasoning to come to similar conclusions about fish.
    - Hand out a fish card and one copy of Fish Adaptations to each student.
      - Tell them that they know nothing about the fish – not even the name. Remind them that the fish are not to scale, so there is no way to know how large it is.
      - They are to study their fish and based on what they observe, they are to write a paragraph describing where they think the fish lives, how it feeds and what it might feed on, how it might protect itself and anything else they can deduce.
  - Once they have finished, bring the class together.
    - Have all of the students who had Fish 1 report their conclusions to the class. Remind them that it is all right if they do not all agree.
    - Repeat for the rest of the fish.
- Explain
  - Now it is time to find out how good their powers of observation and deductive reasoning are! Tell the students the name of each numbered fish so they can identify the fish they were assigned.
    - Fish #1 – bluegill
    - Fish #2 – redbreast sunfish
    - Fish #3 – pumpkinseed sunfish
  - Using books or the Internet, they are to research their fish and write a paragraph comparing their deductions with their research.

        - They are to indicate how accurate their deductions were.
        - Be sure to tell them that it is all right not to be entirely correct.
    - Possible research sources:
        - www.dnr.state.md.us/fisheries/fishfacts/index.asp
        - *Peterson Field Guide to Freshwater Fishes*
        - *National Audubon Society Field Guide to Fishes: North America*

Fish Cards

Fish #1



Fish #2

Fish #3

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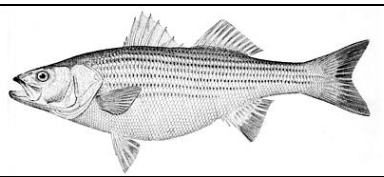
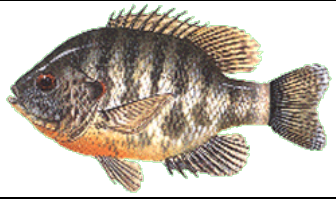
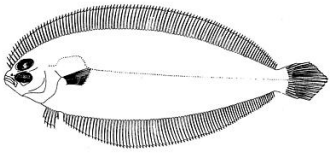
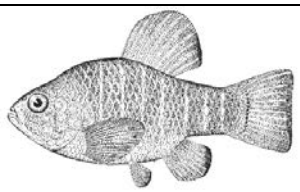
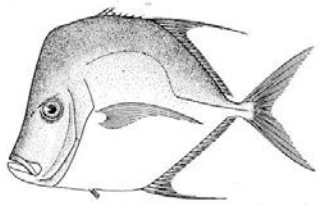
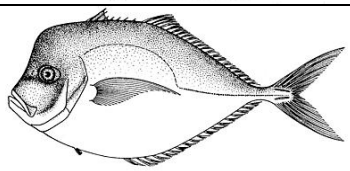
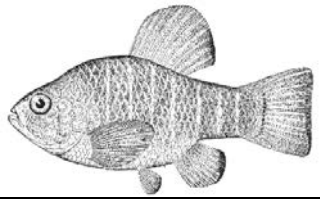
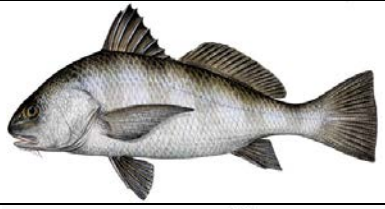
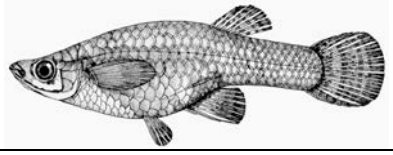
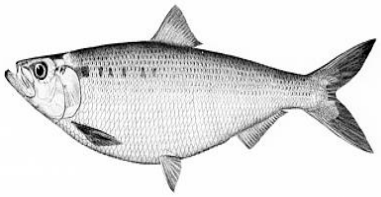
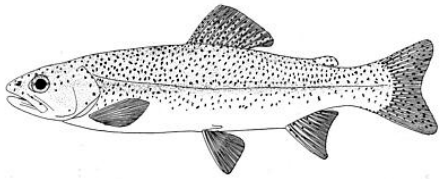
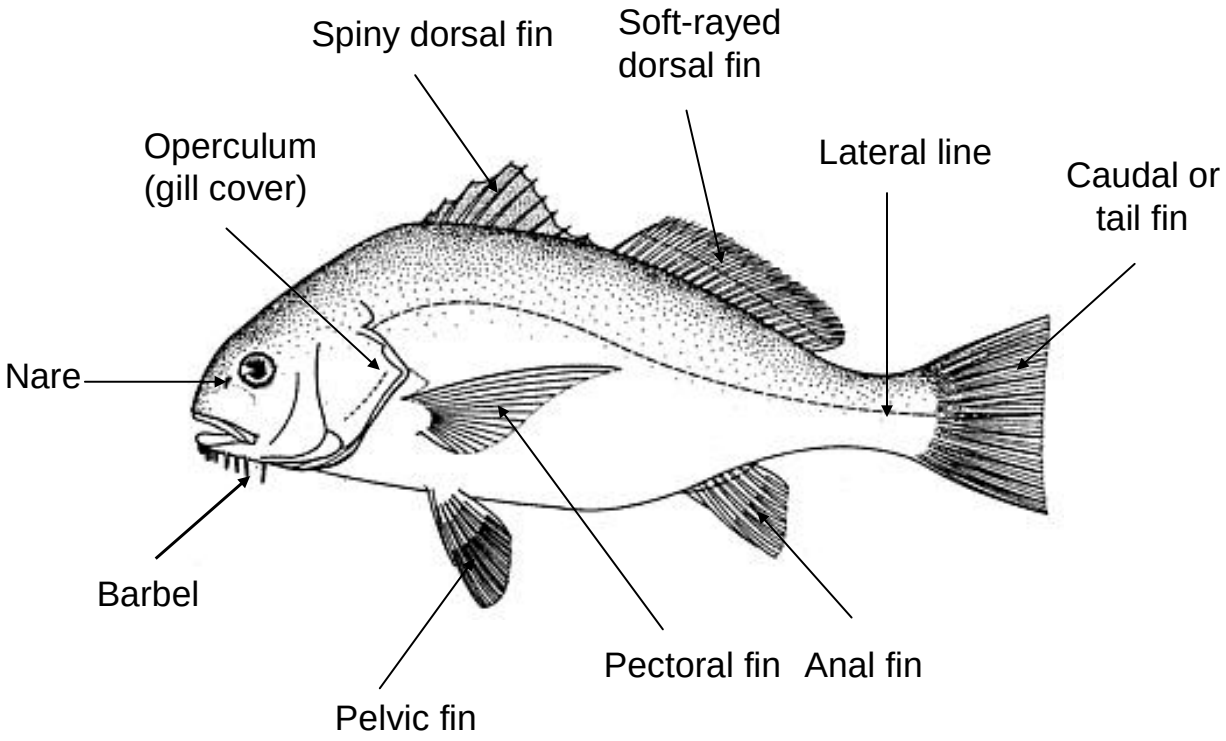
Fish Adaptations (Note: fish are not to scale)

Fish	Adaptation -Body Shape	Indicates
	Fusiform – streamlined slender body	Steady swimmers, usually found in open water or in water that has a current
	Compressed – flattened from side to side	Short bursts of speed and able to change direction quickly; tend to live where there is cover to hide in
	Depressed – flattened from top to bottom	Short bursts of speed
	Adaptation – Shape of Fins	**Indicates**
	Rounded or square caudal (tail) fin	Somewhat slow swimmers but able to accelerate and change direction quickly
	Moderately forked caudal (tail) fin	Somewhat slow swimmers but able to accelerate and change direction well
	Forked caudal (tail) fin	Continuous moderately fast swimmers; fairly good acceleration and maneuvering; often found in fish that live in moving water

	Extremely forked caudal (tail) fin	Tend to be fast swimmers with great acceleration but limited ability to change direction
	Streamlined pectoral fin	Tends to be a faster swimmer
	Paddle shaped pectoral fin	Tends to be a slower swimmer but very maneuverable
	Adaptation – Location and size of Mouth	**Indicates**
	Mouth located at front of snout; jaws are same size	Feeds anywhere in the water
	Mouth located underneath snout; upper jaw extended	Usually feeds on food found on bottom
	Mouth located above snout; lower jaw extended	Usually feeds on food floating on the surface of the water
	Adaptation - Coloration	**Indicates**
	Countershading – dark on back, light on belly	Usually indicates a fish found in open water

	Stripes	Often indicates a fish that hides in weed beds
	Spots	Often indicates a fish that lives in shallow, clear water with sunlight and shadows



External Anatomy of a Fish

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