Is It a Trout?

Grade Level: Middle School
Subject Areas: Life science
Duration: 45 minutes

Maryland State Curriculum:

- Grade 7 Science
    - 3.A.1 – Compile evidence to verify the claim of biologists that the features of organisms connect or differentiate them - these include external and internal structures

Objectives:

- Students will be able to use a dichotomous key to identify game fish found in the Potomac River (or other cold water habitats).
- Students will be able to use their knowledge of external fish anatomy to construct their own dichotomous key.

Vocabulary:

- Adipose fin - a soft, fleshy fin located on the back behind the dorsal fin and just in front of the caudal fin. It may serve to help with stability and to sense the flow of water over the fish's back.
- Anal fin – located on the bottom of the fish near the tail; used mainly to prevent rolling
- Caudal fin –tail fin; used mainly for swimming; It also serves as a rudder, helping to steer the fish.
- Dichotomous – divided into two parts. A key is called dichotomous because at each step the user must make a choice between two alternatives.
- Dorsal fin – the fin located on the upper side of the fish's body; used mainly to prevent rolling
- Nare (plural: nares) – a nostril ; in fish, the nares are used for smelling, not breathing
- Pectoral fin – paired fins, one on each side, usually just behind the gill cover; used mainly for braking and maneuvering
- Pelvic fin – paired fins located on the bottom of the fish below the pectoral fins; used mainly for braking and maneuvering

Teacher Background:

A dichotomous key is a tool that is usually used to identify living things. The key is called dichotomous ("divided into two parts") because at each step the user must make a choice between two alternatives, based on some characteristic of the organism to be identified. Some keys are fairly simple, using easily observed external characteristics, and covering only a limited number of easily identifiable species. Other keys are quite complex and often require extensive knowledge of both internal and external anatomy. Sometimes only an expert can identify an organism down to the species level.

Given the same group of organisms to be identified, the key can be constructed in a number of ways, based on different characteristics, but resulting in the correct identification.

Materials:

- Student worksheet
- Dichotomous key for game fish found in the Potomac River or other cold water habitats
- Pictures of game fish found in the Potomac River

Activity:

- Before beginning this activity, it is a good idea if the students have studied or reviewed the external anatomy of fish, especially the names and locations of the various fins.
- Introduction:
    - Ask the students if they have ever heard of or used a dichotomous ("divided into two parts") key. Explain that a dichotomous key is a tool used to identify things. The key always offers them a choice between two statements at each step, based on an observable characteristic. Their choice will determine the next step.
    - As an example, ask them how they would divide the class into two groups, based on an observable characteristic. If it is a coed school, the obvious answer would be males and females. Then taking one of the groups, how would they further divide them into two groups (For example, students who have brown hair and those that don't) and so on.
- Once they understand how a dichotomous key works, tell them that they are going to use their knowledge of fish anatomy and a dichotomous key to identify several species of fish found in the Potomac River.
    - Hand out fish pictures and dichotomous key and have students work independently to identify the fish.
    - Once everyone has finished, go over the steps that they used to identify each fish (This is because some students may recognize several species and not use the key to identify them!).

Extension:

- Have students create a dichotomous key for species of fish found in different habitats. Students will have to do some research at the library or on the Internet to find pictures and descriptions. Some suggestions might be:
    - Chesapeake Bay – striped bass, killifish, pipefish, menhaden, silversides, lined seahorse, etc.
    - Atlantic Coast – croaker, black and red drum, sea bass, bluefish, spot, Spanish and king mackerel, etc.
- If possible, take a field trip to a cold water stream or lake and have the students use their dichotomous keys to identify fish.

Name that Fish – Student Page

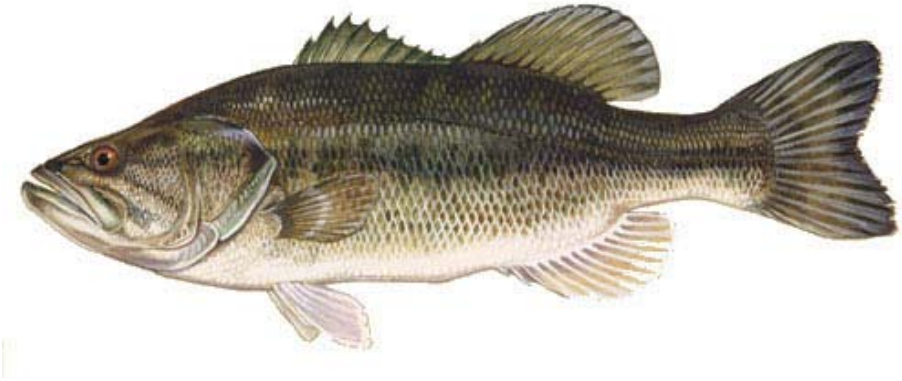
You and your classmates have been learning about the fish found in cold water streams in Maryland, especially trout. You are hoping to take a field trip and you have all been wondering how you could identify the fish. You really want to know how to tell the various species of trout apart. When you ask your teacher, she replies that she is not sure either – that you will have to use a "dichotomous key" to find out.

She explains that a dichotomous key is a way of identifying living things by looking at different characteristics. "Dichotomous" simply means "divided into two parts". At each step you will have two choices; you will have to decide which choice best describes the fish you are trying to identify. Your decision will determine your next step.

How to use the dichotomous key:

- Before beginning, you will need to review external fish anatomy, especially the names of the fins.
- Start with the first fish. Using the key, read the first pair of statements. You will have to decide whether you think the fish has one dorsal fin or two. Once you have decided, follow the dotted line to the right to find a new number.
- Go back to the left side until you find the correct number. Again, you will have to make a decision and then follow the dotted line to the right until you find a new number or name of a fish.
    - If you see another number, go to the pair of steps with that number and continue making choices until you have identified the fish.
    - If you find the name of a fish, you have identified the fish.
- Repeat the process until you have identified all nine fish.

Fish Name:_____



Fish Name:_____

Fish Name:_____

SPORT FISH RESTORATION

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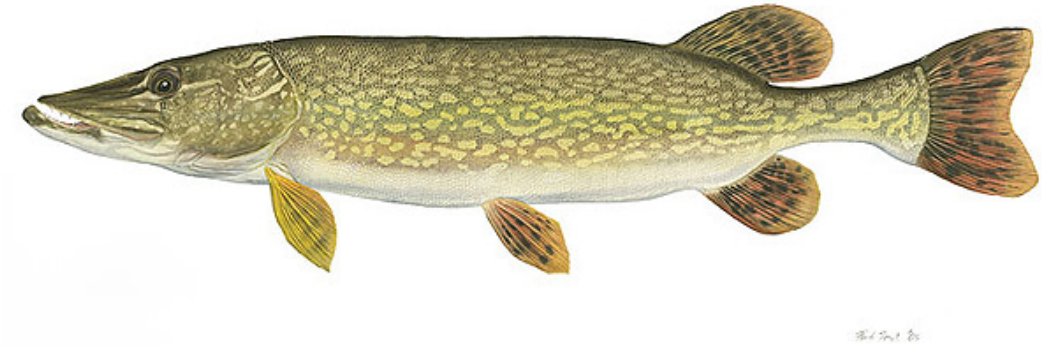
Fish Name:_____



Fish Name:_____

Fish Name:_____

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Fish Name:_____

Fish Name:_____

Fish Name:_____

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Dichotomous Key for Cold Water Game Fish

1a. Fish has one dorsal fin……2
1b. Forked two dorsal fins……4
2a. Fish is spotted……..northern pike
2b. Fish is striped……3
3a. Fish has dark stripes……tiger muskie
3b. Fish has light stripes……muskellunge
4a. Fish does not have spots……5
4b. Fish has spots……6
5a. Fish has large first dorsal fin……walleye
5b. Fish has large second dorsal fin……largemouth bass
6a. Fish has light spots……brook trout
6b. Fish has dark spots……7
7a. Fish has more spots near or on tail……..cutthroat trout
7b. Fish does not have more spots on or near tail……8
8a. Fish has light area in middle……rainbow trout
8b. Fish does not have light area in middle……brown trout

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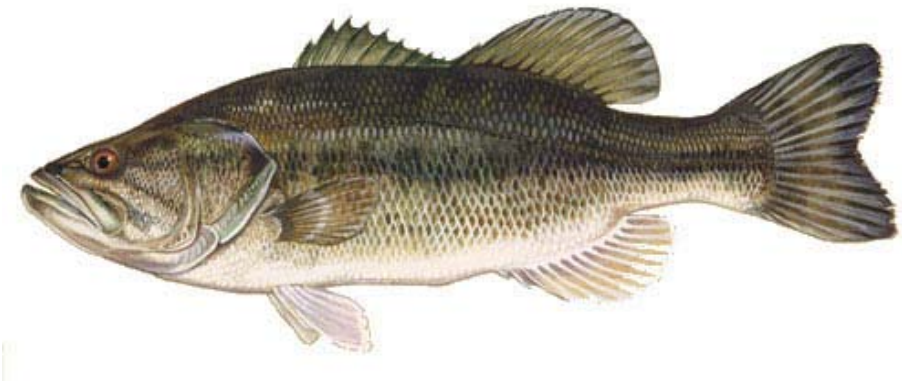
Answers

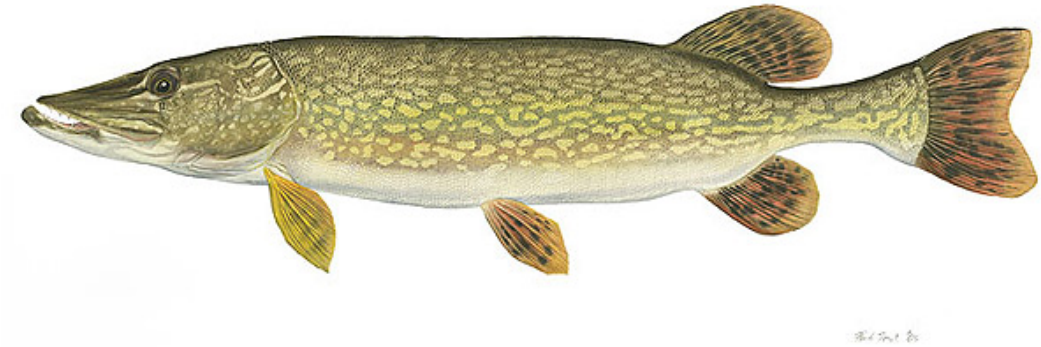
Fish Name: *muskellunge*



Fish Name: *largemouth bass*

Fish Name: *rainbow trout*

Fish Name: *brook trout*



Fish Name: *northern pike*

Fish Name: *walleye*

Fish Name: *cutthroat trout*

Fish Name: *tiger muskie*

Fish Name: *brown trout*

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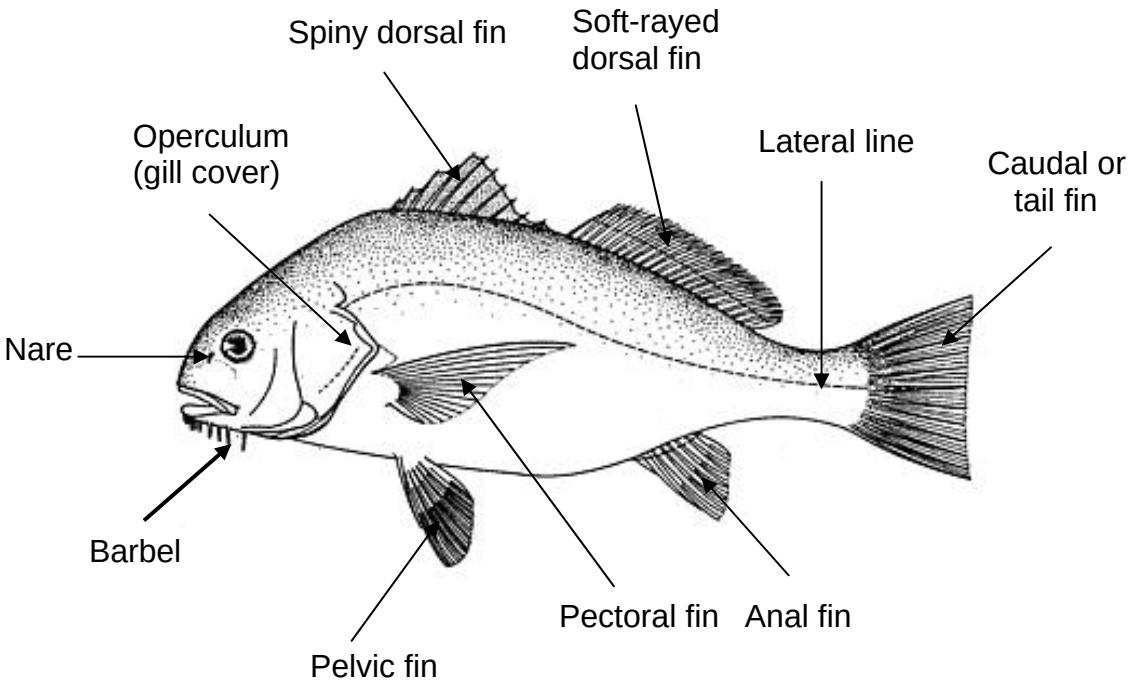

External Anatomy of a Fish