A dichotomous key (classification key) is a tool used by biologists to identify unknown organisms. Biologists have identified and named over 1.5 million different species. A dichotomous key is a branching key; a list of the characteristics of different organisms. These characteristics are arranged in a series of steps which are used to identify the unknown organism.

For this assignment you will observe the diversity among bony fishes and learn to use a dichotomous key to classify members of a group of representative fishes. When using a dichotomous key it is important to recognize all the structures and appendages that are present on an organism. Many of these structures are used for identification.

Part A- Fish Morphology
Most fishes are members of the class Osteichthyes, the bony fishes. Start by looking at the diagram of a bony fish. Study the drawing and learn the names, locations and functions for the labeled structures. You will need to be able to identify these structures when you use the dichotomous key to identify the unknown fishes. Use your notes to answer the questions that follow.

(Courtesy of http://www.nw.wnyric.org/dszatkowski/Labs/Fishlab.htm)
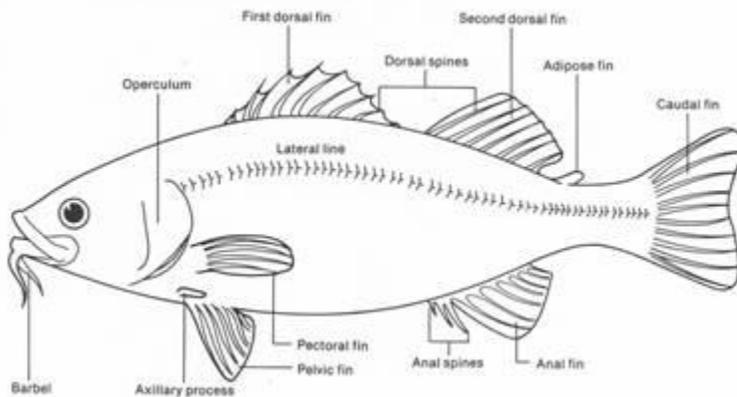
1.   What is the function of the operculum?
2.   Why is it located near the head of the fish?
3.   What is the function of the lateral line?
4.   Do all fish have a lateral line?
5.   Which fins on a fish are paired? Why?
6.   Which fins does the fish use for steering?
7.   Which fins does the fish use for braking?
8.   Which fins does the fish use to keep from rolling?
9.   What is the function of the barbel?
10.   Which types of fish typically have barbels?

Part B - Using a Dichotomous Key
The dichotomous key will give you two choices for each numbered sentence. Choose one of the fish to identify, and read the first numbered statement. For each numbered statement, you will have to decided if a or b most clearly describes the specimen. Once the best decision is made, follow the dotted line to the end of the sentence to find out which numbered statement to go to next. In this manner you will eventually find out what fish you have. Be Patient and Follow these directions CAREFULLY! Do not skip numbers and always start at number 1.

Dichotomous Key for Ten Species of Bony Fish		
1	a Vertebral column does not extend into upper lobe of caudal fin	Go to 2
	b Vertebral column extends into upper lobe of caudal fin	Lake sturgeon
2	a Adipose fin present	Go to 3
	b Adipose fin absent	Go to 6
3	a Barbels absent	Go to 4
	b Barbels present	Channel catfish
4	a Caudal fin forked	Go to 5
	b Caudal fin not forked	Rainbow trout
5	a Axillary process at base of pelvic fin absent	Rainbow smelt
	b Axillary process at base of pelvic fin present	Pink salmon
6	a Dorsal spines absent	Go to 7
	b Dorsal spines present	Go to 8

7	a	Dorsal fin long	Starry flounder
	b	Dorsal fin short	Northern pike
8	a	Elongated body shape	Go to 9
	b	Oval body shape	Bluegill
9	a	Three or more anal spines	Largemouth bass
	b	Fewer than three anal spines	Yellow perch

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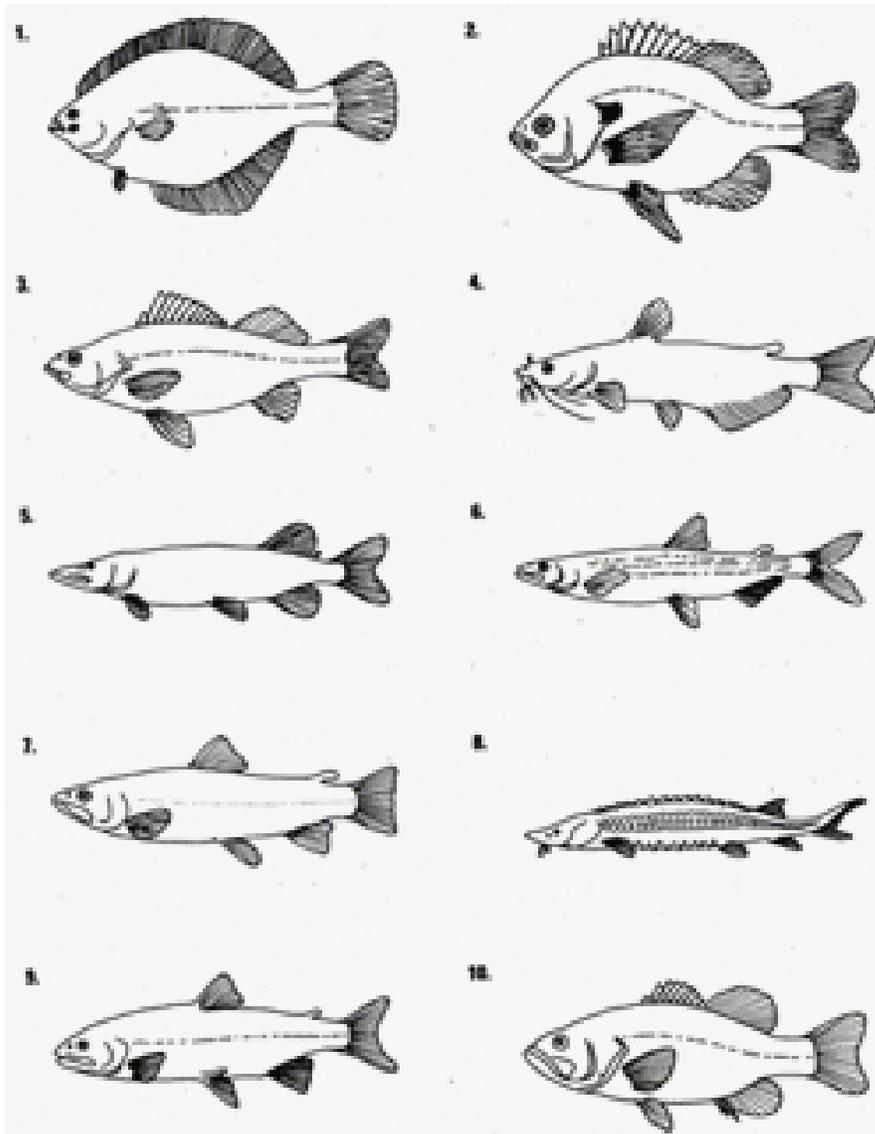
List of identified fish

1._____   6._____
2._____   7._____
3._____   8._____
4._____   9._____
5._____   10._____

Questions
1. What problems did you encounter in using the dichotomous key? Explain.
2. What characteristics are important in identifying different species of fishes?
3. What advice would you give to someone who is going to use a dichotomous key for the first time?
4. What did you learn?
5. If you had to do this activity again, what would you do differently?

Extension:
Collect five pictures of similar type items. Your items can be a group of shoes, insects, jeans, etc. or any other group of items that have similar, yet identifying characteristics. In a word processing document, make a dichotomous key for those items and include the pictures in your document.

Activity Adapted from http://www.nw.wnyric.org/dszatkowski/Labs/Fishlab.htm