

Which Sunfish is It?

Grade Level: Upper Elementary

Subject Areas: Life science

Duration: 45 minutes

Next Generation Science Standards:

- 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

Common Core State Standards:

- ELA/Lit
 - RI.4-5.4 – Determine the meaning of general or domain specific words or phrases in a text relevant to a grade 4 topic or subject area.
 - SL.4-5.1 - Engage effectively in a range of collaborative texts, discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade appropriate topics and building on others’ ideas and expressing their own clearly.

Objectives:

- Students will be able to use a dichotomous key to identify several species of sunfish found in Maryland.
- Students will be able to use their knowledge of external fish anatomy to construct their own dichotomous key.

Teacher Background:

Bluegills are members of the family Centrarchidae or the sunfish family. When many people think of sunfish, they think of bluegills, pumpkinseeds or redbreast sunfish, but in Maryland, this family also includes several other fish that are popular with anglers - largemouth and smallmouth bass, and black and white crappies. This exercise will help students tell the difference between a bass and a bluegill.

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 several ways, based on different characteristics, but resulting in the correct identification.



Materials:

- Student worksheet
- Dichotomous key for some of the members of the sunfish (Centrarchid) family found in Maryland.
- Pictures of several species of sunfish

Activity:

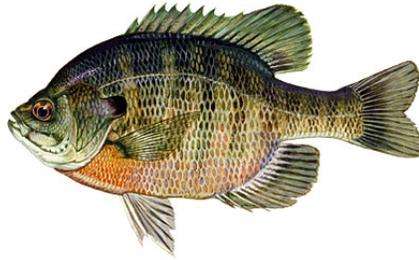
- Before beginning this activity, it is a good idea if the students have studied or reviewed the external anatomy of fish, especially the names and locations of the various fins.
- Engage
 - Ask students whether any of them have been fishing.
 - Has anybody ever caught a bluegill or largemouth bass?
 - How do they know? How did they identify their catch?
 - Were they aware that largemouth bass and bluegill are members of the same family – the sunfish or Centrarchid family? How could they tell them apart?
- Explore
 - Tell them that they are going to learn to use a dichotomous key to identify the different species of sunfish found in Maryland. 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 who 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 sunfish found in Maryland.
 - Hand out fish pictures and dichotomous key and have students work independently to identify the fish.
- Explain
 - 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!).
 - Answers
 - Fish 1 – bluegill
 - Fish 2 – white crappie
 - Fish 3 – largemouth bass
 - Fish 4 – black crappie
 - Fish 5 – redbreast sunfish

- Fish 6 – smallmouth bass
- Fish 7 – pumpkinseed

Extend

- 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 pond and have the students use their dichotomous keys to identify fish.

Name that Fish – Student Page



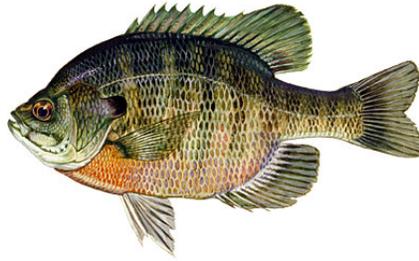
You and your classmates have been raising bluegill in your classroom and learning about the different kinds of sunfish found in Maryland. You are hoping to take a fishing trip to a nearby pond and you have all been wondering how you could identify the fish. When you ask your teacher, she replies that 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:

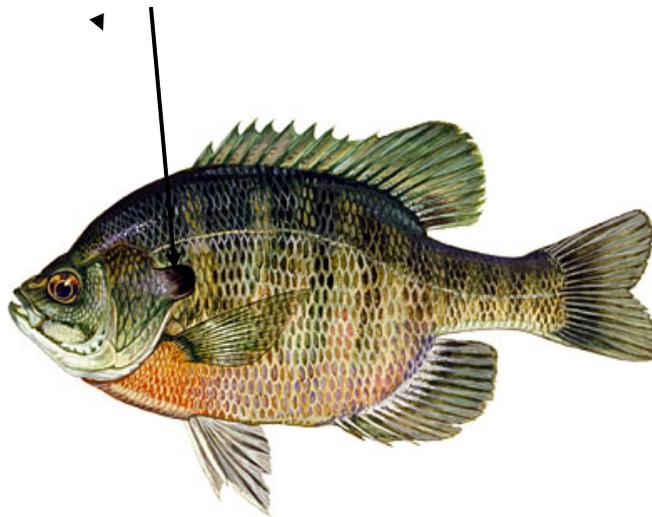
- Before beginning, you will need to review external fish anatomy, especially the names of the fins.
- Start with the first fish. Using the key, read the first pair of statements. You will have to decide whether you think the fish has one dorsal fin or two. Once you have decided, follow the dotted line 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 of the fish.

Dichotomous Key for Sunfishes

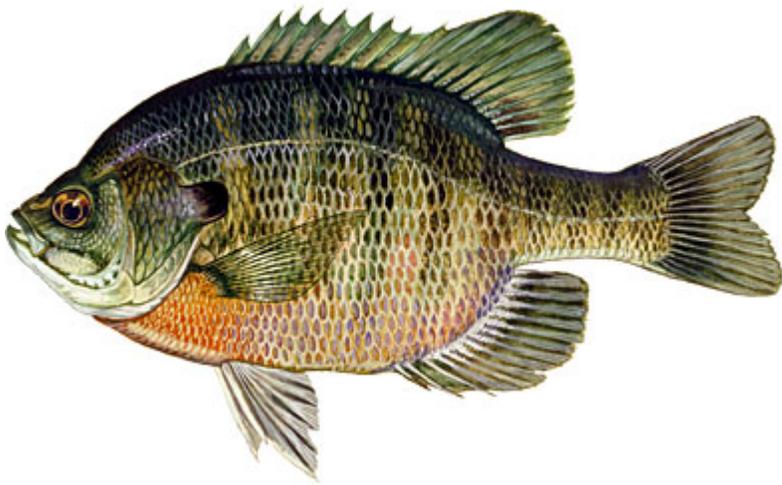


- 1a. Fish has a long, slender (fusiform) body.....2
- 1b. Fish does not have a long, slender body.....3
 - 2a. Fish has diamond-shaped blotches on side...Largemouth bass
 - 2b. Fish does not have blotches..... Smallmouth bass
- 3a. Fish has pointed earflap on gill cover (operculum).....4
- 3b. Fish has rounded earflap on gill cover.....5
 - 4a. Fish covered with dark blotches.....Black crappie
 - 4b. Fish has vertical bars.....White crappie
- 5a. Fish has long dark earflap.....Redbreast sunfish
- 5b. Fish has round dark earflap.....6
 - 6a. Fish has dark bars on side.....Bluegill
 - 6b. Fish does not have dark bars on side.....Pumpkinseed

Earflap (opercular flap)



Sunfish of Maryland



Fish #1 _____



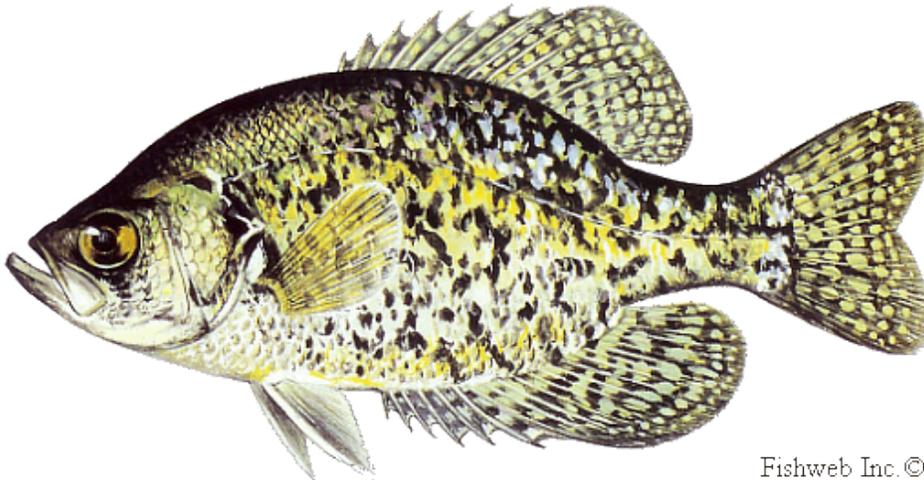
Fishweb Inc. ©

Fish #2 _____



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Fish #3 _____



Fishweb Inc. ©

Fish #4 _____



Fish #5 _____



Fish #6 _____



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Fish #7 _____