WILD Kids

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Identifying Native Fish of Arizona

At one time as many as 35 species of native fish could be found in the waters of Arizona. Today 15 are endangered, seven are threatened, two are no longer found in Arizona (but are elsewhere) and two are already extinct. (Can you name all the native fish of Arizona?).

Most of Arizona's native fish are small (adults are less than 5 inches long), but one reaches over 5 feet in length. Unless you are an expert in identifying fish, many of Arizona's fish are hard to identify without help. One resource that many people use is called a classification or **dichotomous key**. Dichotomous means 'the division into two usually contradictory parts or categories.' A dichotomous key is used to identify not only fish, but almost anything such as trees, grasses, wildflowers, birds, mammals, insects, mushrooms, fruits, vegetables, etc.

A dichotomous key of fish uses characteristics such as the shape of the tail fin, number and kind of fins, location of the mouth, location of the eye, number and kind of teeth, shape of scales, jaw shape, number of nares (nose openings), breeding colors, and overall body shape to name a few. Some characteristics need a magnifying glass to see and count. But these are characteristics that anyone can see with the right equipment. So, how does a dichotomous key work?

A dichotomous key works through a series of "either/or" statements. You must choose which one of a pair of the statements refers to what you are trying to identify. Take only one set of statements at a time. At the end of each statement is a number or name. The number refers to the next set of statements you need to look at. You keep going down the sets of statements until you have reached one that gives you a name.

Suppose an alien from Jupiter came to earth. This alien went into a pet store which sold turtles, frogs, snakes, salamanders and fish. But the alien did not know what type of animals were sold at the pet shop. Fortunately she had a dichotomous key for such animals. It looked something like this:

1. Animal has scales ..... go to 2
1. Animal does not have scales ..... go to 4

2. Animal has eyelids ..... turtle
2. Animal does not have eyelids ..... go to 3

3. Animal has gills ..... fish
3. Animal does not have gills ..... snake

4. Animal has longer hind legs than front legs ..... frog
4. Animal has legs all about the same length ... salamander

The alien tried to identify this animal. She read the first set of statements - Animal has scales (go to statement 2)/ Animal does not have scales (go to statement 4). The animal did not have scales, so she read the set of statements 4. This set of statements required her to measure the legs of the animals. They were all about the same length. Reading the two options in the set again, she identified the animal as a salamander. In this manner, the alien identified all the types of animals in the pet store.

Again dichotomous keys use paired "either/or" statements. Each set of statements refers to one and only one specific characteristic. Statements can refer to shape, size, or length, but not a combination of these characteristics. For example, going back to the animals, statements 1 could **not** read:
1. Animal has scales ..... go to 2
1. Animal has eyelids ..... go to 4
because that is mixing two different characteristics together, scales and eyelids (how would you identify a turtle - would you go to statements 2 or 4?).

Using a dichotomous key is not difficult if you remember the following:

1. Always start with the FIRST set of statements.
2. Take the paired statements one at a time - do not rush ahead to what you think the answer is (you will probably be wrong).
3. Look **closely** at the object you want to identify. If the object is a picture, determine if it is life-size or not (this will help if you need to measure something).

It is even more fun to try to make a dichotomous key!

Activity I: Using a Dichotomous Key

Identify the fish drawings in the right-hand column using the following dichotomous key. Write your answers in the space provide next to each fish. **The fish are not drawn life-size**. Remeber, take one set of statements at a time.

Dichotomous Key

1. Distinct hump on back 2
1. No distinct hump on back 3

2. Dorsal fin (top one) longer than anal fin (fin on bottom just before tail) ..... **Razorback Sucker**
2. Dorsal fin the same length or shorter than anal fin ..... **Bonytail Chub**

3. Adult with a stripe on its side 4
3. Adult without a stripe on its side 5

4. Tail forked ..... **Longfin Dace**
4. Tail not forked, but rounded ..... **Gila Topminnow**

5. Small adipose fin (between dorsal fin and tail) absent 6
5. Small adipose fin present ..... **Gila Trout**

6. Body much longer than it is tall 7
6. Body almost as tall as it is long ..... **Desert Pupfish**

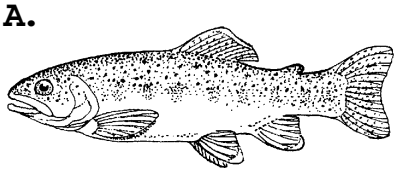
Activity II: Make Your Own

Make your own classification key for these same fishes, using different features or the same but in a different order. Remember that the features you use must be readily see on the drawings.

Activity III: Make A Dichotomous Key

Find pictures of fish in old magazines, newspapers, posters, etc. If you can, cut them out and paste onto a large sheet of paper. If you cannot cut them out, trace them. Next, make up a classification key to identify each fish as you have done above. (Actually you can do this with any type of group - pictures of fruit, mammals, birds, insects, flowers, trees, etc.) Have fun!

A.



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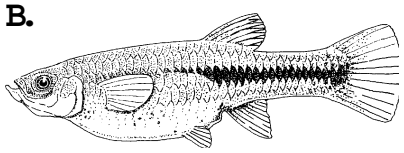

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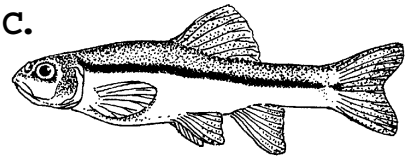

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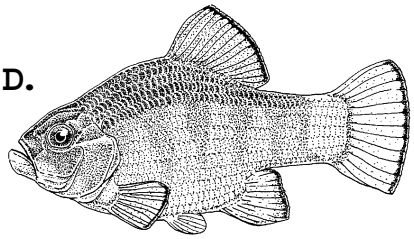

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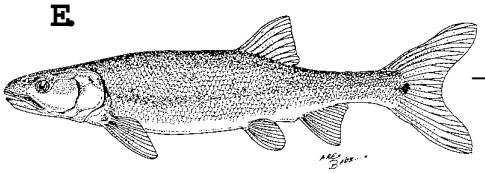

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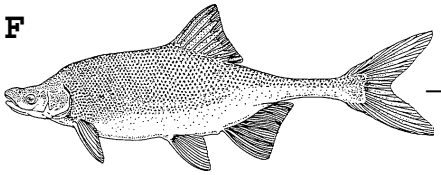

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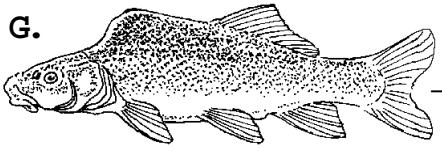

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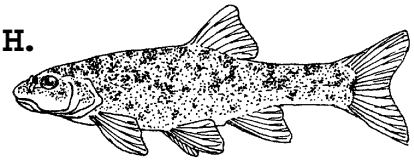
H.



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