

The Dichotomous Key¹

The naming of living organisms, *nomenclature*, and the classification of living organisms into groups, *taxonomy*, is very useful in the study of biology. No biologist knows the names of all the different organisms found on Earth. However, it is important to be able to determine the name that has been given to an organism. Biologists may ask a specialist to identify an organism, but more commonly a biologist will use a taxonomic key to make such determinations. Such keys are written by experts or biologists who specialize in the study of a particular group of living organisms. The most widely used key is the *dichotomous key* (dicho=2 part) in which two characteristics are presented and the individual using the key must make a choice between the two characteristics to determine which one best fits the organism. The procedure is then repeated several times until the characteristics listed are so precise that they specifically relate to the organism in question. The organism is then named.

Example

Suppose that you were asked to determine the name given to the following 6 animals: earthworm, fish, frog, snake, bird and human. If you were unfamiliar with these animals, you would not know what to call them. You could use a *dichotomous key* as a tool for determining the name given to each animal. An example of a *dichotomous key* for the given animals may resemble the following:

1. Appendages (arms or legs) absent.....2
1. Appendages present.....4
2. Gills present.....FISH
2. Gills absent.....3
3. Body showing series of rings (segments).....EARTHWORM
3. Body covered with interlocking scales.....SNAKE
4. Uses all appendages for walking.....FROG
4. Uses only feet in walking.....5
5. Feathers present.....BIRD
5. Hair present.....HUMAN

Characteristics of a Good Dichotomous Key

1. The organism must "fit" one of the two characteristics listed.
2. A single, descriptive characteristic must be used if at all possible.
3. The statements must be concise and precise. Avoid words such as small, short, blunt, fat, pretty, etc.
4. Physical characteristics should be used rather than functional ones. (Example: the heart beats 65 times per minute would be a poor characteristic to use)
5. The *key* must work. The use of the *key* must lead to the identification of the organism.

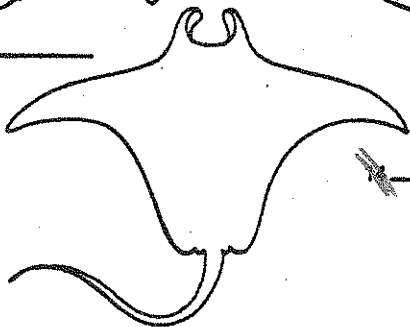
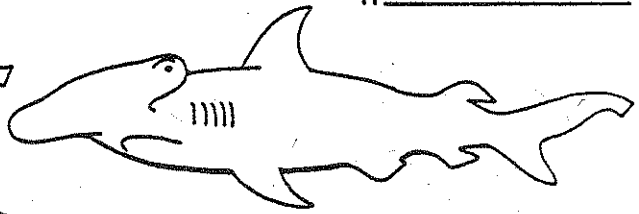
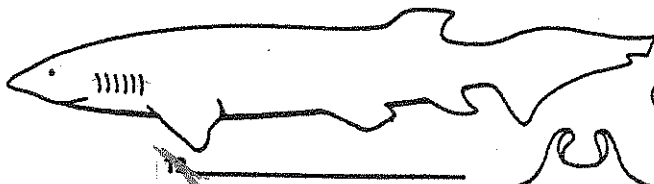
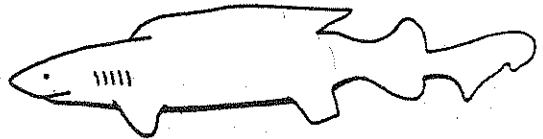
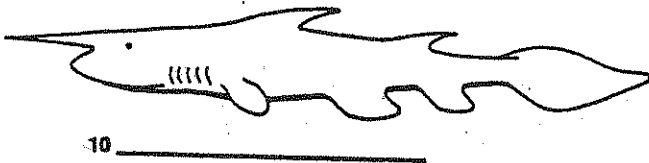
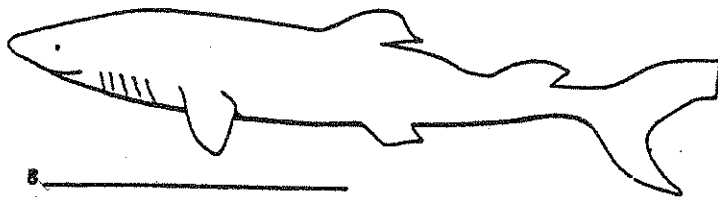
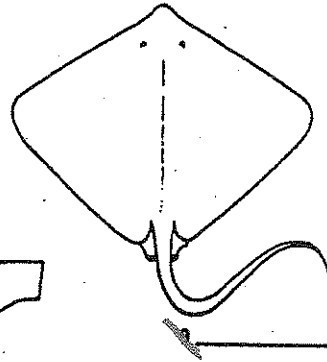
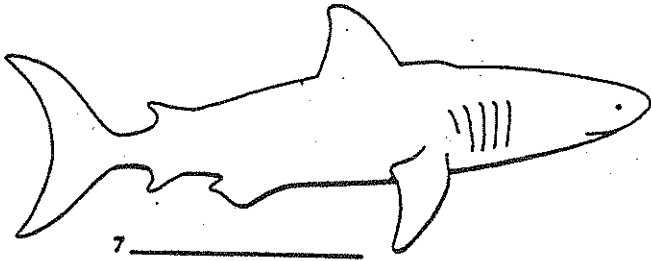
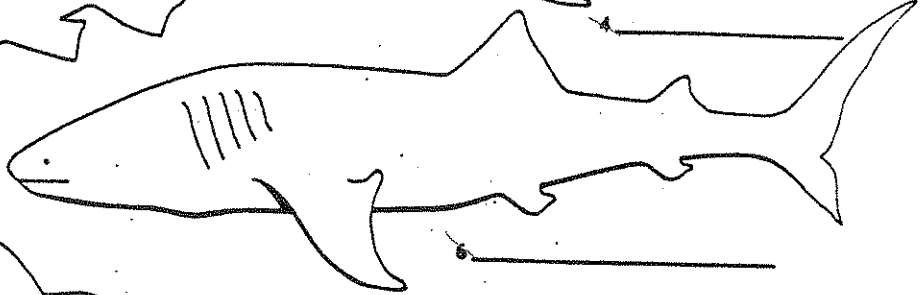
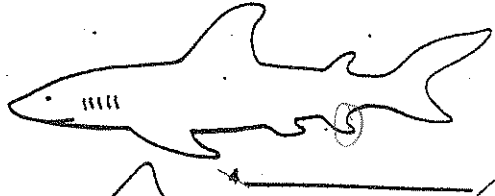
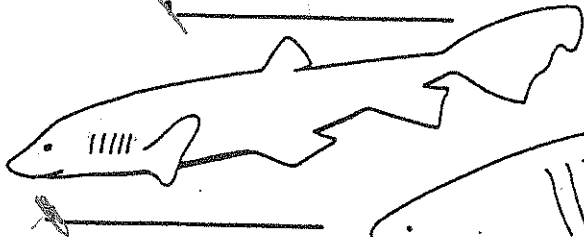
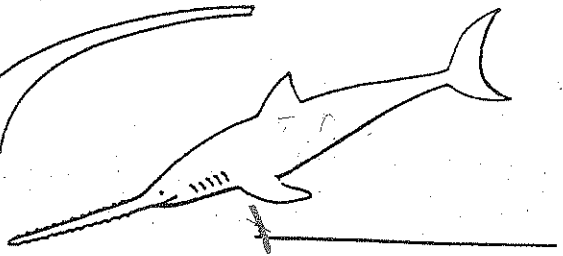
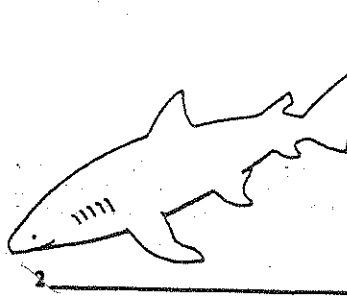
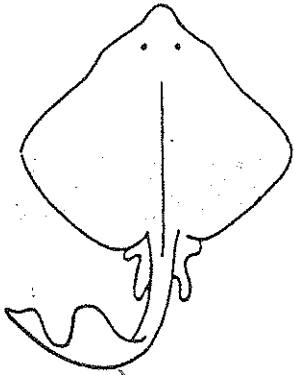
Your Mission

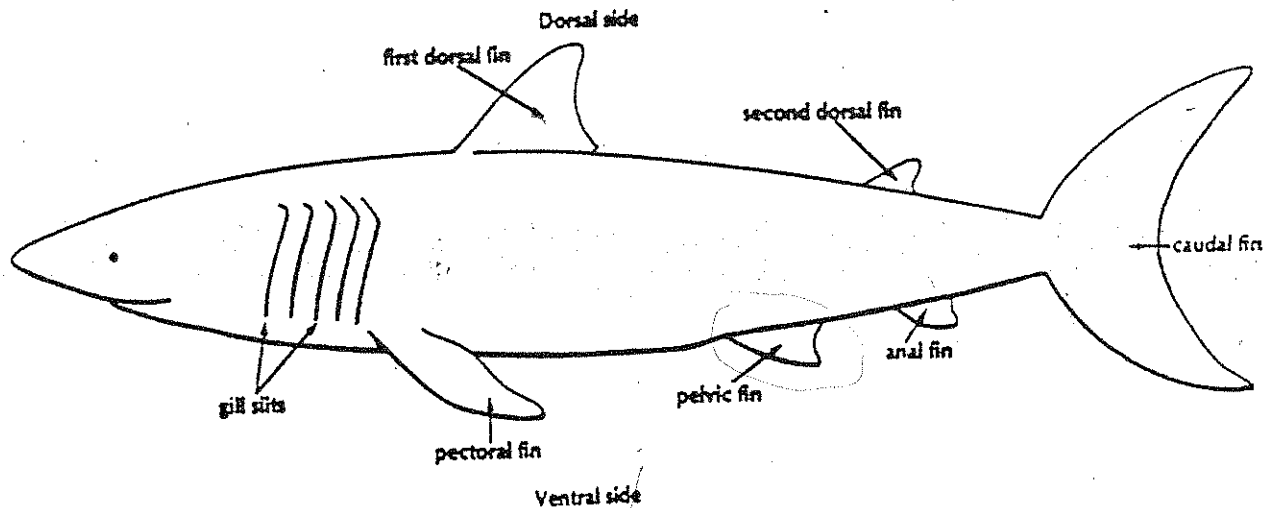
1. You and your partner will use the inanimate objects provided to construct your own *dichotomous key*.
2. Once you and your partner have completed your key, exchange keys with another group. Each group should use the new key to identify the objects.
3. If your key is successful in identifying the objects, hand in your key. If not, rework your key and try again. Be sure to include the names of the students who verified your key along with your names.

¹ Adapted from Dr. R.A. Rogers, Drake University

Name To Work

SHARK KEY





Key

1. A. Body kitelike (if viewed from the top)Go to 12
 B. Body not kitelike (if viewed from the top)Go to 2
2. A. Pelvic fin absent and nose sawlikeFamily Pristiophoridae
 B. Pelvic fin presentGo to 3
3. A. Six gill slits presentFamily Hexanchidae
 B. Five gill slits presentGo to 4
4. A. Only one dorsal finFamily Scyliorhinidae
 B. Two dorsal finsGo to 5
5. A. Mouth at front of snout rather than on underside of headFamily Rhinocodontidae
 B. Mouth on underside of headGo to 6
6. A. Head expanded on side with eyes at end of expansionFamily Sphyrnidae
 B. Head not expandedGo to 7
7. A. Top half of caudal fin exactly same size and shape as bottom halfFamily Isuridae
 B. Top half of caudal fin different in size and shape than bottom halfGo to 8
8. A. First dorsal fin very long, almost half total length of bodyFamily Pseudotriakidae
 B. First dorsal fin regular lengthGo to 9
9. A. Caudal fin very long, almost as long as entire bodyFamily Alopiidae
 B. Caudal fin regular lengthGo to 10
10. A. A long needlelike point on end of noseFamily Scapanorhynchidae
 B. Nose without long pointGo to 11
11. A. Anal fin absentFamily Squalidae
 B. Anal fin presentFamily Carcharhinidae
12. A. Small dorsal fin present near tip of tailFamily Rajidae
 B. No dorsal fin present near tip of tailGo to 13
13. A. Front of animal with two hornlike appendagesFamily Mobulidae
 B. No hornlike appendagesFamily Dasyatidae