Dichotomous Keying

Introduction:

The identification of biological organisms can be greatly simplified using tools such as dichotomous keys. A dichotomous key is an organized set of couplets of mutually exclusive characteristics of biological organisms. You simply compare the characteristics of an unknown organism against an appropriate dichotomous key. These keys will begin with general characteristics and lead to couplets indicating progressively specific characteristics. If the organism falls into one category, you go to the next indicated couplet. By following the key and making the correct choices, you should be able to identify your specimen to the indicated taxonomic level.

Couplets can be organized in several forms. The couplets can be presented using numbers (numeric) or using letters (alphabetical). The couplets can be presented together or grouped by relationships. There is no apparent uniformity in presentation for dichotomous keys.

Sample keys to some common beans used in the kitchen:

Numeric key with couplets presented together. The major advantage of this method of presentation is that both characteristics in a couple can be evaluated and compared very easily.

1a. Bean round	**Garbanzo bean**
1b. Bean elliptical or oblong	Go to 2
2a. Bean white	**White northern**
2b. Bean has dark pigments	Go to 3
3a. Bean evenly pigmented	Go to 4
3b. Bean pigmentation mottled	**Pinto bean**
4a. Bean black	**Black bean**
4b. Bean reddish-brown	**Kidney Bean**

Alphabetical key with couplets grouped by relationship. This key uses the same couplet choices as the key above. The choices within the first and succeeding couplets are separated to preserve the relationships between the characteristics.

A. Bean elliptical or oblong	Go to B
B. Bean has dark pigments	Go to C
C. Bean color is solid	Go to D
C. Bean color is mottled	**Pinto bean**
D. Bean is black	**Black bean**
D. Bean is reddish-brown	**Kidney bean**
B. Bean is white	**White northern**
A. Bean is round	**Garbanzo bean**

Rules for Using Dichotomous Keys:

When you follow a dichotomous key, your task becomes simpler if you adhere to a few simple rules of thumb:

1. Read both choices in a couplet carefully. Although the first description may seem to fit your sample, the second may apply even better.

2. Keep notes telling what sequence of identification steps you took. This will allow you to double-check your work later and indicate sources of mistakes, if they have been made.

3. If you are unsure of which choice to make in a couplet, follow both forks (one at a time). After working through a couple of more couplets, it may become apparent that one fork does not fit your sample at all.

4. Work with more than one sample if at all possible. This will allow you to tell whether the one you are looking at is typical or atypical. This is especially true when working with plants – examine more than one leaf, branch, cone, seed, flower,…etc.

5. When you have keyed out an organism, do not take your effort as the final result. Double check your identification scheme, using your notes. Find a type specimen (if available) and compare your unknown to the type specimen. If a type specimen is unavailable, find a good description of the indicated taxonomic group and see if your unknown reflects this description.

6. When reading a couplet, make sure you understand all of the terms used. The best keys will have a glossary of technical terms used in the key. If a glossary is unavailable, find a good reference work for the field (textbook, biological dictionary,…etc.) to help you understand the term.

7. When a measurement is indicated, make sure that you take the measurement using a calibrated scale. Do not "eyeball" it or take a guess.