

Constructing a Dichotomous Key

Duration: 1 ½ hours

Group Size: variable

Setting: Classroom

Activity Author: Lovina Roselle, Rangeland Ecology and Management Department, University of Idaho

NOTE: Follow-up this activity with the “Dichotomous Key for Grasses” Activity.

The purpose of this activity is to have students explore the process of using a dichotomous system to organize like items. Students will work together to formulate words to describe identifying characteristics of like items.

Goals:

Students will:

- learn the definition of a dichotomous key
- explore the importance of a dichotomous system of organization
- learn how to construct a dichotomous key

Materials Needed:

- 5 sets of 10 items* such as nuts and bolts, portioned into containers
- Handout “Dichotomous Key Tree”
- pen/pencil
- notebook paper
- ruler (optional)

**items may include any collection of like materials. For example, this exercise could be completed using 10 different types of candy or toy bugs.*

Process:

Prepare 5 sets of 10 items separating them into containers. Students will be divided into groups to complete this activity. They will need desk or table space to lay out their container of items.

1. Divide students into groups of 3 to 4 students each. Give each group a set of items. Have the groups designate a member as a “recorder”, who will take down information as it is decided upon. They will need to record information on the Dichotomous Key Tree handout. On a separate sheet of paper, have them write down each term and give a brief description. Remind students that if they are describing size, to use actual measurements instead of generic terms (large or small). Also, use positive terms to describe the objects such as “is” instead of “is not”.

2. Tell them to divide the items in the container into 2 piles. The piles do not have to have an equal number of items, but they have to agree that there is some obvious characteristic that distinguishes the piles from one another. After they agree on what is different, have the recorder write down terms for the 2 distinguishing features on the main branches of the dichotomous key tree.
3. Have them set one pile aside for now.
4. With the remaining pile, have the students again divide the items into 2 piles. After they agree on another distinguishing characteristic of each pile, have them record the term on the second level branch of the dichotomous key tree.
5. Continue the process of dividing the items into two distinct piles and recording the characteristics on the dichotomous key tree until there is only one item with the identifying characteristic.
6. Repeat the process with the pile that was set aside until all the items have been identified.
7. Return all of the items to the container.
8. Tell students that dichotomous keys usually appear in a text form rather than a diagram and that their diagram should be reorganized into text.
9. Have the students use a number and letter system to organize their terms that they described in writing, emphasizing the importance of following the order of classification.
10. Have students pull one item back out of the container. Using the assumption that they had never seen the item before, ask them how difficult it would be to try and pinpoint which item in the key it would correspond to without the help of the key. Students should discover that an item in a key cannot be identified without starting from the beginning point.
11. Have students return to their seats and move onto discussion points.

Discussion:

1. Discuss what the term “dichotomous” means, explaining that it is a term meaning “divided into two parts”.
2. Discuss reasons for the importance of dichotomous keys to science. Have students give examples of importance (i.e. comparing, communicating, ordering, and categorizing).
3. Move onto the activity titled “Dichotomous Key to Rangeland Grasses”