

# Construct a Key

## Activity Overview:

Students devise a classification key for plants.

## Objectives:

- Learn to use an identification key
- Observe the structure of plants and the differences between them

## Subjects Covered:

Science, Language Arts, and Art

## Grades:

6 through 12

## Activity Time:

1-2 hours

## Season:

Late spring, Summer, Early fall

## Materials:

Natural site, material for tagging plants, field sheets, clipboards, and pencils

## State Standards:

### Science:

Design investigations to test models (A.8.7)

Identify answerable questions (C.8.1)

Explain data & conclusions (C.8.7)

Reexamine evidence & reasoning (A.12.7)

Evaluate data (C.12.3)



Whorled Milkweed

## Background

Keys are very useful ways to identify plants, animals or just about anything. Perhaps the best way to learn how to use a key successfully is to construct your own. In constructing a key, the best way to tell if your key is “right” is if other people can successfully use it. The nature of the questions that you ask in your key is not important—it is only critical that the key works and works efficiently.

A key asks a series of questions. Each question has only two possible answers. Depending upon your answer you will take one path or the other. Each path then leads to another fork in the road where another question is asked. In this manner you will answer a series of questions about your object and eventually you will discover its identity.

A good key will provide a first question that divides a group into two roughly equal categories based on some fairly obvious trait. Then each subgroup will receive another choice, which will further divide them into two fairly even groupings.

The guidelines for constructing a key are:

1. Each question should divide the group of objects into two subgroups of roughly equal size.
2. Each question must have only two possible responses.
3. The question should refer to a trait that is obvious and unambiguous.

## Activity Description

Go out to the natural area. Work by yourself or with one or two partners.

Select six to eight plants to include in your key. Choose either flowering plants or dried plants that have gone to seed. Carefully examine the plants. Devise the first question for your key. The question can have only two possible responses. For example, are the leaves lobed or not lobed? Is the plant taller than four cm? How many petals does the flower have—three or fewer or more than three?

Secondly, the question should refer to a trait that is clear and unambiguous. For instance, do not ask if the flower is dark or light blue. Instead, ask if the plant is blue or yellow. Similarly, rather than asking if the plant is tall, ask if it is taller than one meter. (Be careful with questions based on height or size that can vary from one individual plant to the next.) Finally, make sure the question divides the group into two equally sized subgroups.

After you have come up with a good first question, you will need to come up with additional questions for each of the subgroups. Use the same rules that you did for the first question. Continue in this manner until your key

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## Construct a Key (cont.)

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can direct the user to each individual plant through a series of questions.

Tag the plants that you included in your key and exchange keys with another group. Try to use their key. What parts of their key work well and are clear and what parts are confusing? How would you improve their key?

### Extensions

- Indoor alternative: Cut out photographs of eight to 12 prairie plants from a prairie seed catalogue. Prairie seed nurseries will often donate old seed catalogues to classrooms. Paste one picture on each card or sheet of paper. Under the photograph, write the common and Latin names of the plant. Make a key with the cards by spreading them on a table and dividing them into groups. After you have developed and written down the key, try to make a different key with the same set of cards. Which key is better?
- Devise the following types of keys:
  - a key that is not based on sight
  - a key that a seven-year-old child could use
  - a key that uses only pictures and no words.

### Additional Resources

- Cochrane, T. & Iltis, H. (2000). *Atlas of Wisconsin prairie and savanna flora*. Madison, WI: Department of Natural Resources.
- Curtis, J. T. (1959). *Vegetation of Wisconsin*. Madison, WI: University of Wisconsin Press.
- Kirt, R. R. (1995). *Prairie plants of the Midwest: Identification and ecology*. Champaign, IL: Stipes Publishing Co.
- Mirk, W. (1997). *An introduction to the tall grass prairie of the Upper Midwest*. The Prairie Enthusiasts, c/o Gary Eldred, 4192 Sleepy Hollow Trail, Boscobel, WI 53805.
- Newcomb, L. (1977). *Newcomb's wildflower guide*. Boston: Little, Brown & Co.
- Runkel, S. T. & Roosa, D.M. (1989). *Wildflowers of the tallgrass prairie-The Upper Midwest*. Ames, IA: Iowa State University Press.
- Smith, J. R. with Beatrice S. Smith. (1980). *The prairie garden-70 native plants you can grow in town or country*. Madison, WI: The University of Wisconsin Press.
- Stokes, D. & Lillian. (1985). *A guide to enjoying wildflowers*. Boston: Little, Brown & Co.

### Assessments

- Exchange keys among classmates. Test and rate your classmates' key for usability and accuracy.
- Scramble a key and have students put the questions back in the correct order to make it work.
- Study an existing key and describe how the key is designed to identify a plant species.

