
Bimodel Botany Bouquet

Activity Overview

A warm-up activity to introduce students to rain garden plant species and encourage their observational, organizational, and taxonomic skills.

Objectives

Students will:

- Use their observational skills
- Learn how plants differ structurally from one another
- Learn the scientific naming system for plants
- Appreciate unique characteristics of native rain garden plants

Subjects Covered

Science and Language Arts

Grades

1 through 12

Activity Time

30-45 minutes

Season

Any

Materials

Sample plant specimens representative of the native rain gardens you have planted (or plan to plant) on your school grounds.

State Standards

Science: B.4.2, B.8.2, B.8.5, B.12.1, B.12.3;

Language Arts: C.4.1, C.4.2, C.4.3, C.8.1, C.8.2, C.8.3, C.12.1, C.12.2, C.12.3, D.4.1, D.8.1, D.8.2, D.12.1, D.12.2, F.4.1, F.8.1, F.12.1

Background

Rain Garden Plants Are Unique

Plants suitable for rain gardens are adapted to both wet and dry soil conditions. This select group of native plants is able to survive drought and floods. Plants growing in a rain garden will not survive if they cannot withstand these extremes. After a rainfall, plants are inundated with water. During times of no or little rainfall, plants are without water. This characteristic of being able to withstand opposite conditions is called “bimodal.” Native plants used in rain gardens have long, deep-growing roots that are able to direct water downward through channels in the soil, which moves water quickly. They also take in water along their entire root system and transpire (release) it out into the atmosphere. These long roots also help the plants reach available moisture during the driest times, therefore not requiring special irrigation. Rain garden plants are unique and perfectly suited for the job of taking rainwater out of the storm water system.

Plant Names are Unique

There are a variety of languages spoken around the world. In North America, you can find many different languages, ranging from English, Hmong, and French to Spanish, German, and indigenous languages such as Cayuga and Oneida, among others.

Scientific names are basically another language system, which uses Latin as the root source. Latin, which is often a combination of Latin and Greek, was historically the language used by educated people and is the reason why Latin was chosen to give scientific names to plants and animals.

For a long time scientists were confronted with the challenge that one plant or animal species could have many different names, depending on what language was spoken. This challenge created all sorts of language barriers when scientists from different parts of the world wanted to talk about their research. In 1758, a Swedish biologist, Carl Linnaeus, decided everyone should use the same name to describe a given species and proposed a universal naming system, now known as “binomial nomenclature” (bi = two, nomen = name, calo = call, so it translates as “two-name name-calling”). This naming system gives each species a surname and a personal name, just like people in North America have. If you are called Pat Jones then Jones is your surname, and Pat is your personal name. Scientists call the equivalent of a person’s last name the “genus” or “generic name.” The genus always has a capital letter as the first letter. The equivalent of a person’s first name is called the “specific name” and is written entirely in lower case letters. Unlike people’s names in North America, the generic name comes first and the personal (specific) name is second in this binomial system. For example, the Latin name for the tree species, red maple, is *Acer rubrum*. *Acer* is the Genus name. There are at least another dozen different maples found in North America that have the same genus name. This is just like you and your siblings, all of

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whom have the same last name. The species name *rubrum* is similar to your first name and tells you it is a red maple.

These Latin names have other meanings, too. For instance, “*rubrum*” means “red” in Latin, and red is generally the color red maple leaves turn in the fall season. Sometimes the scientific name is based on people’s names, such as *Heuchera richardsonii*; *Heuchera* after Johann Heinrich von Heuchera, an early German medical botanist, and *richardsonii* after Sir John Richardson, a 19th century North American explorer. Some plants are given a name based on where the plant was first discovered, such as *Elymus virginicus*. *Virginicus* refers to the state of Virginia.

The following activity will help students understand the scientific naming process and familiarize them with the diversity and unique attributes of rain garden species they plant on their school grounds. Students will learn the variety of patterns and shapes of plant parts. The next step can be applying names to what they observe in terms of plant structure (see Earth Partnership for Schools’ activities, “Plant Families” and “Taxonomy and Field Guide Warm-up”).

In addition to acquainting students with rain garden species and their names, this activity is a good introductory activity to a plant unit and/or can be used as an “ice-breaker” among a group of students who do not know each other well. Likewise, this activity can sharpen participants’ observation skills and build upon their creativity as they learn more about plant structure and diversity.

Activity Description

1. Prepare a bouquet of plant species, representing a rain garden. The number of sample plants will depend on the size of the group and should be approximately a third to a quarter of the number in the group. For example, a group of 30 students will break into 6 groups of five, which will require five samples from 6 different plant species.
2. Have the bouquet well mixed and pass out one plant to each person.
3. Ask those who know names of the plants being passed out not to share that information until the end of the activity.
4. Allow group members to find others who have the same plant, and then form a small group. If participants do not know one another, ask them to introduce themselves to the other group members.



EPS 2005 Institute participants discussing their plant’s characteristics. Photo: Libby McCann.

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5. Ask groups to come up with a creative description of the plant based on their close observations that would help others identify that plant.
6. Next, ask them to come up with a creative name for their plant.
7. Request representative(s) from each group to present their plant's name and description.
8. Once a small group has shared their creative name and related plant description, ask the entire group if they know the common and scientific names of the plant. If the name is unknown, share common and Latin names and a further description (especially ecological and human uses) of each plant.

Discussion

Ask group members why they think there are scientific names for plants—then review the history of why plants have scientific and common names. Have students visit the library to further research the plants used during this activity, the related habitat preferences, and the human uses for the plants.

Conclude with a discussion of why these particular native plants are perfectly suited for infiltrating water in rain gardens and the characteristics that make them suitable.

Extensions

- Complete Earth Partnership for Schools activity “Taxonomy and Field Guide Warm-up” to learn more about plant structure and identification.
- Collect weed plant samples that appear in the native rain garden that need to be identified and removed.
- Write a story that describes a plant and its characteristics and explains the related adaptations to wet/dry conditions and its ability to infiltrate and filter storm water.
- Create a phenology calendar, journal, or computer database that describes your plant observations throughout the year.
- Develop a Web page on the plant species from this activity using photos, drawings, and life history information.

Additional Resources

- Cochrane, T.S., Elliot, K., Lipke, C.S. (2006). *Prairie plants of the University of Wisconsin-Madison Arboretum*. Madison, WI.
- Densmore, F. (1974). *How Indians use wild plants for food, medicine, and crafts*. New York: Dover.
- Eggers, S. D. et al. (1997). *Wetland plants and plant communities of Minnesota & Wisconsin*. Second edition. St. Paul, MN: U.S. Army Corps of Engineers, St. Paul District.
- Foster, S. (1990). *Field guide to medicinal plants: Eastern and Central North America*. Boston: Houghton Mifflin.
- Kindscher, K. (1992). *Medicinal wild plants of the prairie: An ethnobotanical guide*. Lawrence, KS: University Press of Kansas.

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- Meeker, J.E., Elias, J.E., & Heim, J.A. (1993). *Plants used by the Great Lakes Ojibwa*. Odanah, WI: Great Lakes Indian Fish and Wildlife Commission.
- Neal, Bill. (2003). *Gardener's Latin*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Newcomb, Lawrence. (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.
- Harlow, W.M. (1957). *Fruit key and twig key to trees and shrubs*. New York: Dover.
- Wisconsin Department of Natural Resources. (1990). *Forest trees of Wisconsin: How to know them*. Madison: Bureau of Forestry (PUBL-FR-053 90REV).

Web sites:

- Rain Garden Plant List: <http://dnr.wi.gov/org/water/wm/nps/rg/plants/PlantListing.htm>
- Vascular Plant Species of the Wisconsin State Herbarium: <http://www.botany.wisc.edu/wis-flora>
- Basics of Tree ID: <http://www.cnr.vt.edu/dendro/forsite/Idtree.htm>

Assessments

- Name (common and scientific name) and describe at least 2 plant species.
- Write a short story describing the plant species used in this activity, the human uses of the plant (e.g., medicinal uses), and the root words of the plant's scientific name.
- Create a mobile with drawings illustrating various plants and their unique physical characteristics. Include the scientific and common names on the mobile.
- Describe the adaptations and beneficial and unique characteristics of plants used in rain gardens.



Monarda fistulosa or "Bad Hair Day." Other names include Beebalm, Wild Bergamot and Horsemint. Photo: Molly Fifield Murray.