

Lesson Plan for Classification of Plants in your Schoolyard Creation of a Herbarium

This lesson plan is designed to aide in the classification of plants in your schoolyard. Students will use their knowledge of plant structure and observation skills to determine the defining characteristics of the plants. Then, if desired, students can classify plants using plant reference material or the matrix based key on www.discoverlife.org.

Primary Learning Outcomes

Students will learn the defining characteristics of plants and how plants are classified. Students will learn and observe the differences between monocots and dicots. Students will learn how to use reference material to determine the species of a plant. Students will learn how to create a herbarium and the importance of maintaining accurate records and observations.

Assessed Georgia Performance Standards

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh6. Students will communicate scientific investigations and information clearly.

SB3. Students will derive the relationship between single-celled and multi-celled organisms and the increasing complexity of systems.

Procedures/Activities

Instructor Preparation:

Step: 1 Duration: 60-90 minutes

Plants in the school yard should be identified, marked, and characteristics noted a day or two prior to the class period during which this activity will be conducted. It is easy to use utility flags numbered as necessary to mark the plants, if available. If unavailable a bright colored ribbon could be used.

Classroom activity:

Step: 1 Duration: 10-15 minutes

Review the characteristics of plants that students will be observing in the schoolyard. Characteristics will likely include leaf type, leaf arrangement, and leaf margin. Students should know and understand the difference between monocots and dicots. Use the attached PowerPoint presentation, overheads, or www.discoverlife.org to review the characteristics with your students.

Step: 2 Duration: 60-70 minutes

Equipped with a clipboard, pencil, and characteristics chart (see **Field Chart 1** at end of document), students should observe the plants and fill in the plant characteristics chart for each plant marked. If desired, during this time plant clippings may be obtained to create a herbarium for the class. If students work in groups, each group may be assigned several plants to collect clippings with the assistance of the teacher and a pair of gardening sheers. Also, pictures of the plants may be taken if a camera is readily available—this would further aid in classification.

Step: 3 Duration: 30-45 minutes (This activity is best done by the teacher outside of class)

Creating the herbarium is easy. The leaves need to be pressed for at least 24 hours between sheets of newspaper under a set of heavy books prior to this step. After leaves are pressed, place them between two sheets of wax paper (waxed sides in toward the leaf). Gently press the wax paper with a medium hot iron slowly over the entire surface for about 10 seconds. Repeat for the remaining leaves you wish to press. The wax paper will be hot after pressing, so allow the pressed leaves to cool before using. After step 4 is completed, the herbarium should have labels applied to the plant specimens for preservation and future reference.

Step: 4 Duration: 60-70 minutes

Classification of the plants using either reference material available at the school or local library, or using the web-based matrix key at www.discoverlife.org. Once the plants are classified, the labels should be applied to the herbarium specimens. Labels should include information such as scientific name, common name, date collected, where collected, and who collected.

Materials and Equipment

Plant characteristics: Clipboard, field markers (flags or bright ribbon)

Herbarium: waxed paper, iron, newspapers, heavy books, labels

Total Duration

Teacher preparation: 60-90 minutes for plant characteristics, 30-45 minutes for herbarium creation

Two class periods will be necessary to classify the plants: The first to observe and determine characteristics; the second to classify and determine the species of the plants.

Assessment

Students will be assessed according to the accurate completion of their field sheet and the identification of the species.

Modifications

The herbarium may be created by students by securing the leaves to pieces of white paper with tape or glue. The information about the specimen can then be directly written on the paper. As much or as little of this lesson can be used as desired by the instructor. There are two student handouts attached at the end of the lesson plan (Field Chart 1 and Field Chart 2). The instructor may choose to use the Field Chart 2 if there is no desire to create a herbarium, but rather just learn plant characteristics.

Plant Number	Group (Grassy or Woody)	Leaf Type (Simple or Compound)	Leaf Arrangement (opposite, alternate, whorled)	Leaf Margin (Hairy, Lobed, Smooth, Toothed, Wavy)	Other Notes (i.e. bark texture/color, flower, fruit)	Plant Species (Determined using DiscoverLife.org)
1						
2						
3						
4						
5						
6						
7						
8						
9						

Plant Number	Group (Grassy or Woody)	Leaf Type (Simple or Compound)	Leaf Arrangement (opposite, alternate, whorled)	Leaf Margin (Hairy, Lobed, Smooth, Toothed, Wavy)	Other Notes (i.e. bark texture/color, flower, fruit)	Plant Species (Determined using DiscoverLife.org)
10						
11						
12						
13						
14						
15						
16						
17						
18						

Field Chart 2


Name _____

Plant Number	Type (Monocot or Dicot)	Leaf Type (Simple or Compound)	Leaf Arrangement (opposite, alternate, whorled)	Sketch
1				
2				
3				
4				
5				
6				
7				

Field Chart 2

Name _____

Plant Number	Type (Monocot or Dicot)	Leaf Type (Simple or Compound)	Leaf Arrangement (opposite, alternate, whorled)	Sketch
8				
9				
10				
11				
12				
13				
14				



Characteristics of Leaves and Leaf Structures

Eva McLanahan



Function of Leaves

- Manufacture food for the plant through the process of photosynthesis
- Equation for Photosynthesis:
 - $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$



Monocot vs Dicot

- Look at leaf venation



Monocots

Parallel-veined leaves

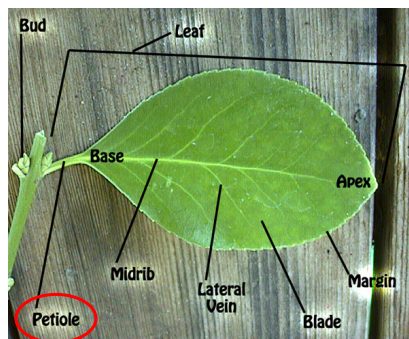


Dicots

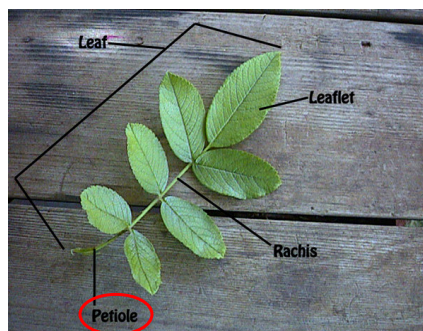
Net-veined leaves



Dicots Leaf Structure



Simple



Compound



Dicots Leaf Arrangements



Alternate



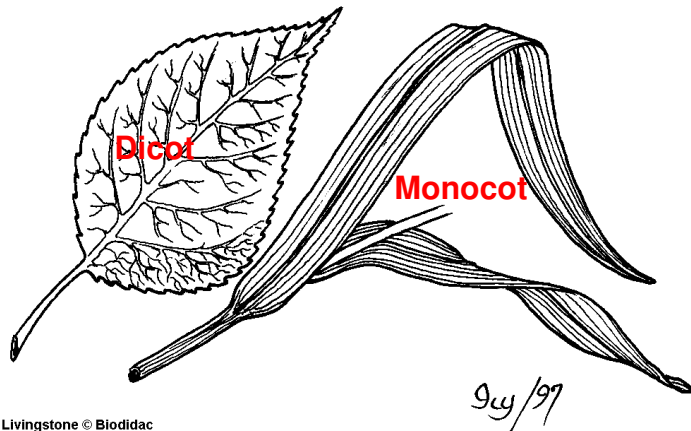
Whorled



Opposite



Monocot? Dicot?

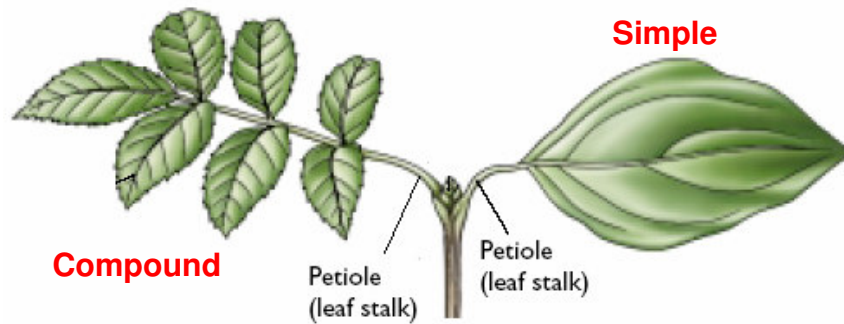


Livingstone © Biodidac

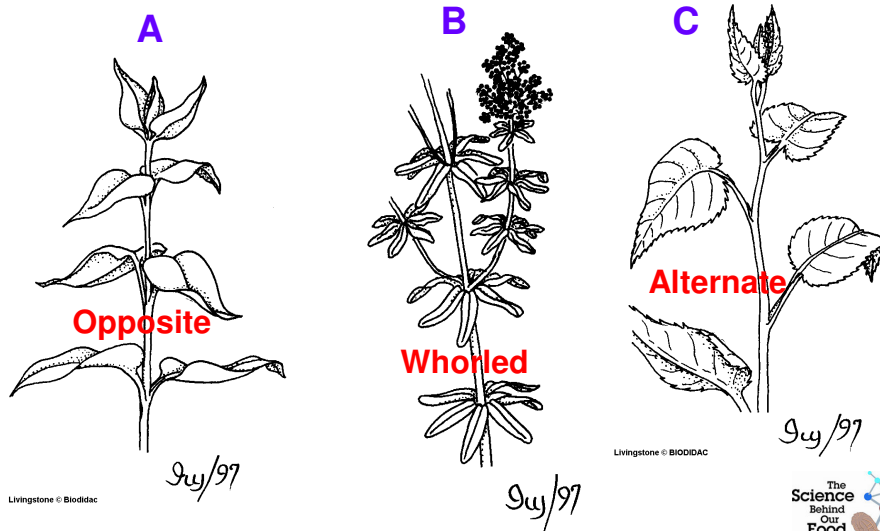
9/9/97



Simple? Compound?



Alternate? Opposite? Whorled?



Dicots

Leaf Margins

Margin: Edge – as in the edge of a leaf or edge of a lake.



Hairy



Lobed



Smooth



Toothed



Wavy

