

Classifying Plants: Plant Types

Teacher's Guide

Subject: Integrated Science (Life Science)

Topic: Plant characteristics; plant adaptations; classification of plants

Summary: Students will locate, observe, and classify five unique types of plants (vascular/nonvascular, seedbearing/spore producing, flowering/nonflowering, monocots/dicots). Students will use a dichotomous key to determine what type of plant is observed.

Objective(s): After completing the field lab, students will be able to:

1. Identify distinguishing characteristics of major plant types
2. Determine distinguishing characteristics
3. Use dichotomous key

Ecosystem(s): Sandhills; Pine Flatwoods; Hardwood forest;

Equipment:

- GPS Receiver
- Plant Classification Ref. Chart
- Flagging tape
- Magnifying lens/glass
- Digital Camera (optional)

Background:

- **Reference Material:** Florida Science (Glencoe Grade 7) Chapter 12: Classifying Plants
- **Vocabulary:** nonvascular, vascular, gymnosperm, angiosperm, monocot, dicot

Procedure (Engage; Explore; Explain)

1. The students will assemble at the pine tree near the parking lot of the park. Students will walk the Perimeter of the Park to observe certain plant characteristics. Pine, Sea grape, Cabbage Palm, grass, Lichen.
2. The group will stop periodically at predetermined plants to discuss the plant characteristics and use the dichotomous key to determine the plant type.
3. Engage the students by asking a specific question that gets to the heart of the activity: If we found a plant and wanted to know what type of plant we have found, how are we going to find out what it is? (look at the characteristics of the plant)
4. Upon reaching the first stop, ask the students several questions to ascertain what they already know. What is vascular tissue? Why do plants need vascular tissue? What types of plants do not have vascular tissue? If we are looking to see if a plant has flowers and do not find any what else can we look for on the plant? (Fruit) What does parallel mean? What does a branching network look like? Clarify any misconceptions.
5. Ask them to formulate their own hypothesis relating to their own expectations of the outcome of the lab. Explain to them that the classification of plants is based on a number of important characteristics such as whether they are vascular (have tubelike structures for the movement of water, nutrients and other substances through the plant) or not, whether they have seeds or spores, and whether they have seeds that are not protected by a fruit, etc.
6. Explain that a dichotomous key is used to help scientists determine what an organism is. Ask the students if they know what a distinguishing characteristic is. We will identify distinguishing characteristics; then, answer yes/no questions to determine what the plant type is.
7. Explain to the students that they will observe and identify characteristics of five types of plants along the trail. They will compare their observations with a dichotomous key attached to their data sheet to determine what plant they found.
8. After completing the lab, allow the students to answer the discussion questions as a group and explain their answers relating them to the concepts, processes and skills associated with the activity. Students should record their answers individually. At this time, facilitators can introduce/explain the specific concepts and explanations in a formal manner.

Sunshine State Standards:

Science: SC.F.1.3.1; SC.G.1.3.2, 3; SC.H.1.3.4; SC.H.2.3.1

Language Arts: LA.A.1.3.3

Social Studies: SS.B.2.3.9

Mathematics:

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Student Data Sheet

General Information

Full Name:		Date:	
Science Teacher:		Time:	

Hypothesis:

If non vascular plants need to be close to their water source, then there will be more

(choose one: vascular/ non vascular) plants in a dry habitat because..._____

_____.

Field Observations/Measurements/Data

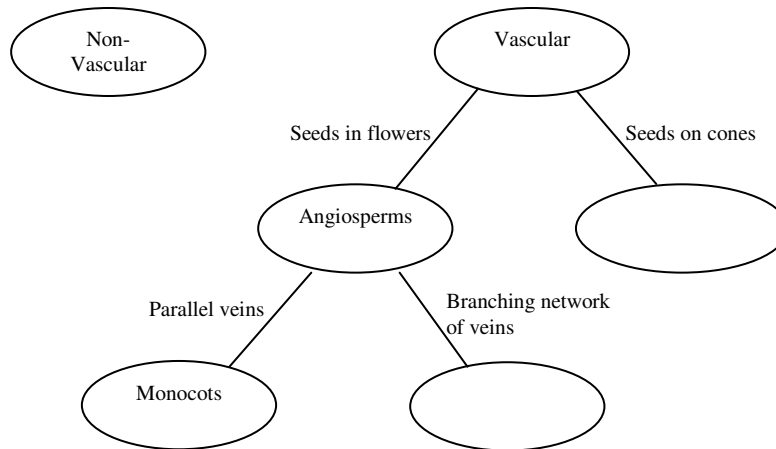
- 1a. No vascular tissue presentlichen or moss
- 1b. Vascular tissue is present.....go to 2a
 - 2a. Reproduction by spores..... Ferns
 - 2b. Reproduction by seed.....go to 3a
 - 3a. Seeds are on scales in a cone.....Gymnosperm
 - 3b. Seeds are in a fruit or flowers are present.....Angiosperm...go to 4a
 - 4a. Parallel veins in leaves.....Monocot
 - 4b. branching network of veins in leaves.....Dicot

Plant #	Plant type	Determining Characteristic	Plant #	Plant type	Determining Characteristic
Plant 1			Plant 4		
Plant 2			Plant 5		
Plant 3			Plant 6		

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Assessment Questions

1. Complete the following concept map.



2. Seedless vascular plants produce spores instead of seeds. Of the different plants you saw today, which one(s) produced spores?

3. Does your data support your hypothesis? Whether your hypothesis is supported or not, what can you infer from your observations?

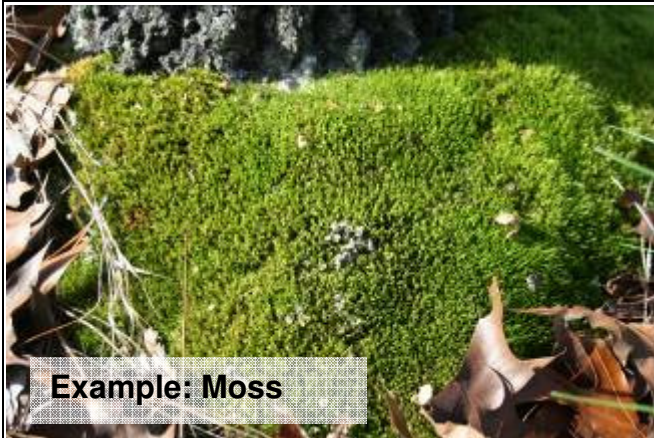
4. If this lab was conducted in a wet habitat such as a swamp, what types of plants would you expect to see more of? Why?

5. When observing nature with your school or with your family you may see interesting plants. What are some ways you can share the beauty of the plant or find the name of the plant later without picking the plant? Why is it harmful to if you pick the plants?

6. Think about what you learned in this lab. Has it generated any new questions? Write a new question about something you want to learn more about.

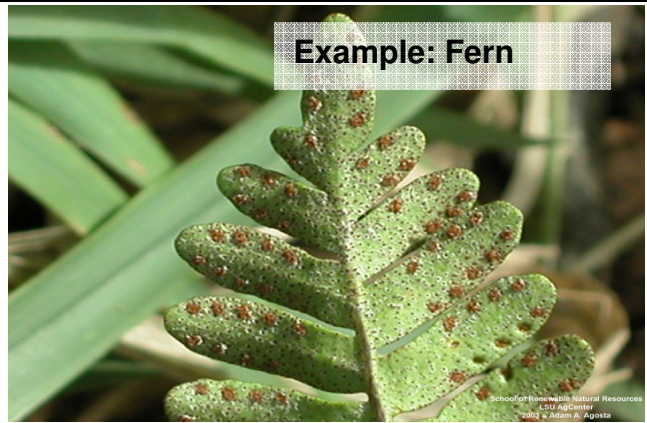
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Plant Type Reference Chart



Example: Moss

Nonvascular, Seedless Plants: Small (usually only 2 cm to 5 cm in height); Green stems; reproduces by spores, threadlike roots; grows in damp areas.



Example: Fern

Vascular, Seedless, Plants: Reproduces by spores often found on the underside of the leaves; can be various sizes because they have vascular tissue



Example: Pine Trees

Vascular, Seed-bearing, Non-flowering, Non-fruit bearing: Vascular plants that produce seeds (usually found in cones), do not have flowers, and typically have needle or scale-like leaves.



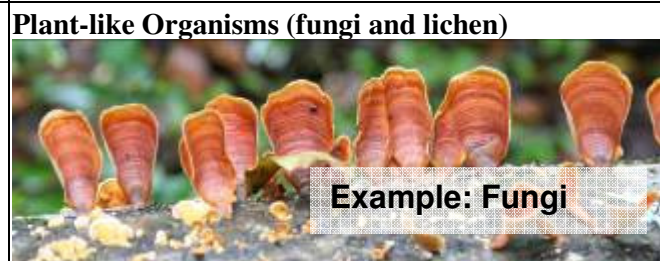
Example: Palms

Vascular, Seed-bearing, Flowering, and Fruit bearing, Monocot: Flower parts in multiples of three; leaves usually narrow and long; parallel veins; seeds have one cotyledon



Example: Magnolia Tree

Vascular, Seed-bearing, Flowering, and Fruit-bearing, Dicot: Flowering parts in multiples of four or five; leaves have a network of branching veins; seeds have two cotyledons



Example: Fungi



Example: Lichen