Science Lesson Plans: How Plants Are Grouped

Objectives

- Ask a question that can be tested by doing an investigation
- Make inferences to explain observations
- Major groups of plants
- Plants reproduce in different ways
- Scientists classify and categorize plants into groups according to their physical characteristics
- Some plants change in response to changes in seasons

Standards
NGSSS Benchmarks:
SC.3.N.1.1 Raise questions about the natural world.
SC.3.N.1.2 Compare the observations made by different groups using the same tools, and seek reasons to explain the differences.
SC.3.N.1.4 Recognize the importance of communication among scientists.
SC.3.N.1.5 Recognize that scientists question, discuss, and check others' evidence and explanations.
SC.3.L.15.2 Classify flowering and non-flowering plants into major groups such as those that produce seeds or spores based on their physical characteristics
S.C.3.L.17.1 Describe how plants respond to changing seasons.

Age
3rd Grade

Vocabulary: habitats, environment, classification (classify, classifying) , categorizing, observe, compare, predict, infer, communicate, data, investigate, conclude, seed, flower, cone, spore, spore case, deciduous, pollinate, coniferous

Materials Needed: pictures of the following habitat areas from the Theodore Roosevelt Area Wildlife from the Timucuan Ecological and Historical Park: Fresh Water Wetlands, Maritime Hammock, and Salt Marsh (see attached). For the explore you will need to provide several kinds of leaves, including leaves from flowering plants, needles from evergreen trees such as pines or juniper, and fern fronds with spore cases on the underside. Flowers and cones such as sunflowers, daisies, marigolds, and black-eyed Susans all have visible seeds. Hand lenses, copies of lab sheets one per student, copies of seasonal sort from the 3rd grade learning schedule, science journals/notebooks, time to explore the school grounds

Instructional Activities***
ALL 5 Es WILL NOT BE DONE IN ONE CLASS PERIOD.
However, an informal assessment must be completed at the end of each class period.

Engage: Begin with sharing pictures of the following habitat areas from the Theodore Roosevelt Area Wildlife from the Timucuan Ecological and Historical Park: Freshwater Wetlands, Maritime Hammock, Salt Marsh

Ask: *Where do you think these pictures are from? What do you notice about the plants in the pictures? Why do you think they grow in that environment? What words would you use to describe the habitats (areas)? What animals do you think live in each place?*

Define a habitat as a natural place where plants and animals live. The teacher may choose to have the picture to project from a computer screen or printed out. Chart or list students' responses. Encourage students to discuss what observations they made in order to describe the plants and animals in each habitat. Keep the responses and pictures for further use.

Opening:
(I do) "Today we are going to sort, which means to put together the things that are alike into groups. Scientists do this type of investigating with living and non-living things. When you put together items that are alike that is known as *classifying (sorting)*". Model classifying a couple of the pictures together by alike traits, such as habitats that have water. (We do) Have students help you to name the group that you came up with. "Scientists also have to name the group that has alike qualities. This is known as *categorizing*. The name of the group should tell others how those items are alike, such as *places with water*. Chart the words with their kid friendly meanings on chart paper or the board.

Explore (Investigation):
(You do) "Today you will be asked to classify or group several kinds of leaves from different plants. I want you to think like a scientist would and first begin with developing questions you think are important to ask about the leaves you will be looking at. Discuss the questions you will ask with your group members (other scientists)". Have a couple of questions shared from the group and have students write them down in their science notebooks to get them started. "Then you will be asked to communicate why you thought it would be a question the group should explore when you look at the leaves. You should also communicate about what you notice about the leaves. Scientists also have to take good quality records of what they find by observing or notice using their eyes, nose, touch, smell, and sometimes taste. (Explain that some plants can be irritating or even dangerous.) When your group is finished observing and asking questions I would like you to classify the leaves into different groups by what they all have in common or how they are all alike. Then categorize or give the group a name."

How I will informally assess the Explore: Students will be asked to complete a lab sheet (See attached) with scientific processes to be recorded. They should also reflect on how and why they choose questions to explore and list observations in detail.

Explain: "All plants have one major thing in common: they produce their own food. (Ask students if they know what the plant needs in order to produce its own food) They use this food to stay alive, grow, reproduce, or make other plants." Share with students that scientists can classify (sort) into two major groups by how they pollinate or reproduce; seed producers (flowering plants or cone bearing plants) and spore producers (ferns and mosses)".Have students name some of the common cone bearing plants they know-pine trees and mold, mushrooms, and mildew are spore bearing plants. Ask: *How can scientists decide if a plant is a seed producer or a spore producer?* Develop student friendly definitions of the terms pollinate, seed producer and spore producer for working knowledge. Have students draw and name examples of each in science journals or lab books.

How I will informally assess the Explain: Students will complete a word sort using the pictures to help them with their classification (See attached).

Extend: Ask: *What do some plants do in the winter in order to survive? If you ever have been up to the north during the fall season what do you notice about the trees? Can you conclude or infer why that happens?* If your students are not familiar with the term "infer" develop a working definition that will be good for them to use. Such as "read between the lines" or make a good guess based on what you already know. "Some plants change depending on the season. You might think of a season as spring, summer, fall, or winter. In Florida because our weather does not change as much as in other parts of the country (may want to point out the relationship to how close to the equator we are) we use the amount of rain we receive to determine the differences in seasons. Ask: *Which season has the most amount of rain? Which season has the least amount of rain?* Some plants lose their leaves in the winter because they don't need them anymore. These plants that lose their leaves are known as deciduous plants. And some plants keep all of their parts including leaves all year long. These plants are called coniferous plants also known as evergreen plants because they have green leaves during the winter. Model making an inference by saying, "I can infer that if the season is a dry spell or one with very little rain than a deciduous plant loses its leaves because the plant has to conserve or save its water and the leaves take up a lot (absorbs) of the plant's water." Plants and animals adapt to the rise and fall of water levels. White Water Lilies grow long stems-up to 3-4 meters (10-12 feet)-when the summer rains come and the water rises, so that the

pads and flowers can float on the surface. (Lantz and Hale) Another plant we have in Florida that changes depending on the rainfall seasonal changes is the Resurrection Fern. In the dry parts of the season the leaves of the fern curl up and make the fern look like it is dead. When the plant gets enough water the leaves of the fern uncurl itself making it look like it came back from the dead. Tell students that resurrection means to come back from the dead.

How I will informally assess the Extend: Give each student a copy of the seasonal changes sort to complete (Located in the Duval County learning schedule for 3rd grade science page 15) Students are to observe and describe what they think is happening to the plants in each section.

Evaluate (Method): Identify and describe similarities and differences among plants by classification (sorting) and categorizing (naming the group) by being seed bearing, spore bearing, deciduous, or coniferous. Take students on a tour of the school grounds and have them classify the plants using the previous methods they have learned.

Homework: Have students collect 5 types of leaves from their neighborhood. They will classify and categorize them using a characteristic of their choice.

Science Lesson Plans: How Plants Are Grouped Resources

Picture Credits:

http://soulofamerica.com/soagalleries/jacksonville/beaches/Jvl-Timucuan_Preserve.jpg
http://farm1.static.flickr.com/36/79972239_cc22c046de.jpg
http://farm1.static.flickr.com/170/424323692_a041604522.jpg
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http://mainevolunteerlakemonitors.org/mciap/herbarium/images/NymphOdorataSitu4.jpg
http://www.floridagardener.com/FLNatives/Dry_Resurrection_Fern.jpg
http://www.biosurvey.ou.edu/okwild/misc/images/resfern.jpg
http://msucares.com/lawn/garden/msgardens/05/images/050718.jpg
www.saidaonline.com/.../mushroom-saidaonline.jpg
http://www.scenicnursery.com/archives/sunflower.jpg
http://lynne484.files.wordpress.com/2010/02/pecan-nuts-on-tree-wikipedia.jpg
http://farm1.static.flickr.com/177/431693936_1dcad1f79a.jpg
shakyard.com/.../2007/07/30/marigolds.jpg
www.apsnet.org/.../PhotosI-M/mildew.jpg

Informational Credit:

The Florida Water Story by Peggy Sias Lantz and Wendy A. Hale
Duval County 2010-2011 3rd Grade Learning Schedule

Name:
Date:

Classify-_____
_____

Categorize-_____
_____

Science Skill 1: Questioning

1. Get into teacher assigned group
2. Examine or look at the leaves on the table
3. Write down at least 3 questions you have about the leaves.

_____
_____
_____
_____

4. Take turns sharing your questions with your group and listen carefully.
5. Pick one question from your group that you liked the best and record it.

_____
_____

Science Skill 2: Making Observations

1. Look closely at the front and back of each leaf.
2. Touch and describe how each leaf feels.
3. Draw each leaf in the space below.

_____
_____
_____
_____
_____

4. Are there any other ways you could learn about this leaf?

_____
_____
_____

Science Skill: Classifying

1. Examine or look at the leaves and talk about you notice about each leaf.
2. **Classify or group** the leaves that are **alike.**
3. **Categorize** or name each group.
4. Tell why you chose those leaves to put together.
5. Now try to group them in another way.

Science Skill: Communication

1. Talk with your group members about what you noticed.
2. Write down what you are still wondering.
3. Record what your group talked about here.

_____
_____
_____
_____
_____

Science Skill: Reflection

Today I learned_____
_____
_____

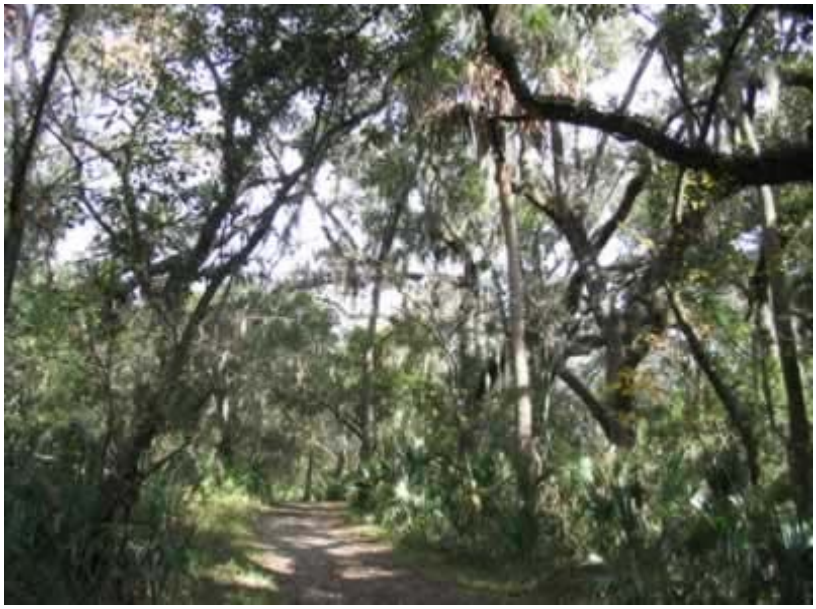
I think that leaves can be classified by _____
_____
_____

I still have questions about_____
_____
_____

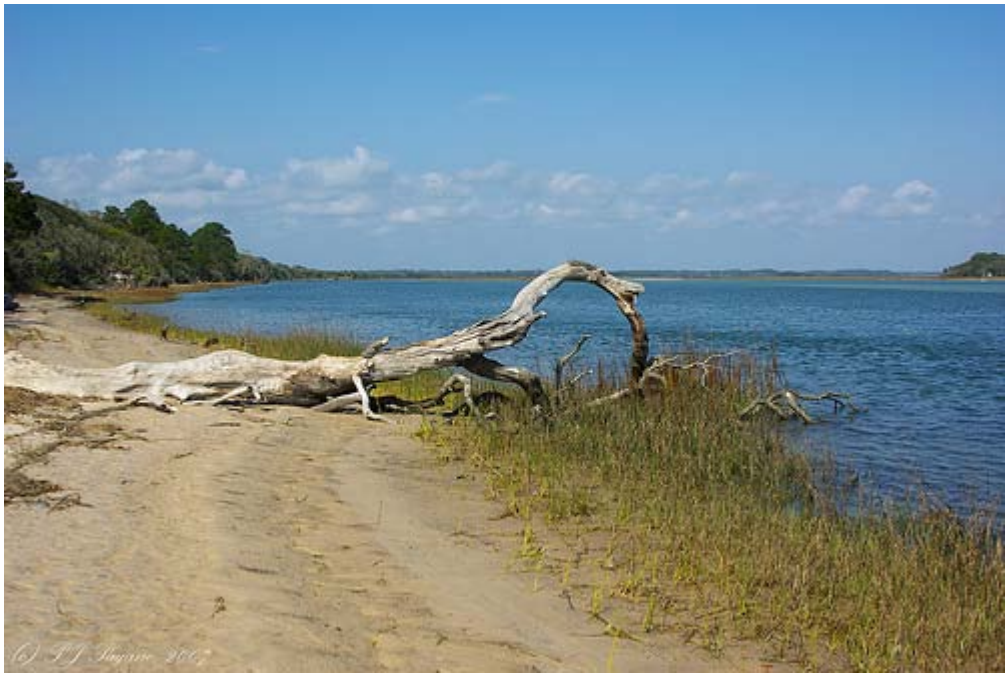
Circle the best answer
Today my participation with others was:
Okay-I helped by giving answers some of the time
Good-I took turns, discussed issues, helped others
Poor-I did not talk much, I know I can improve next time

Salt Marsh

Maritime Hammock Forest



Salt Marsh



Maritime Hammock Forest

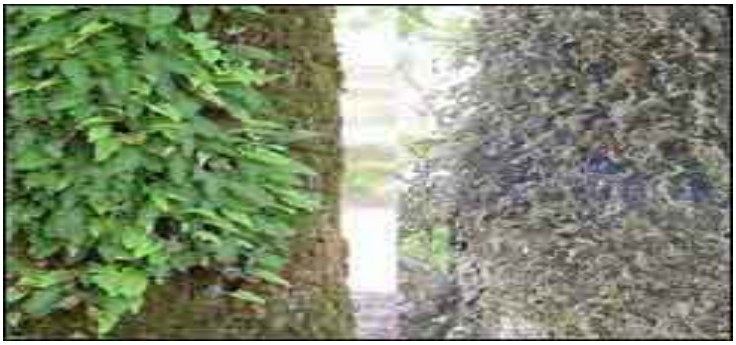
Salt Marsh Creek High Tide

Salt Marsh Creek Low Tide

Fresh Water Cypress Tree Swamp

White Water Lillis

Resurrection Fern



Name:
Date:

Types of Pollination Sort

Directions: Label each plant by the type of producer they are. A *seed producer makes seeds* and a *spore producer releases spores into the air* to pollinate. **Write the words "seed" or "spore" next to each picture below.**

1.

Mushroom

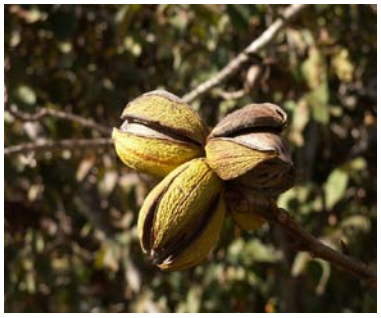
_____

2.

Sunflower

_____

3.



Pecan Tree

_____

4.

Reindeer Moss

_____

5.

Marigold

_____

6.

Mildew (on the leaves)

_____