Fontenelle Forest Nature Center
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Plant-astic

Welcome to the natural world of Fontenelle Forest and Neale Woods Nature Centers! Below is a guide to pre and post field trip activities that you can do with your students either indoors or on your school grounds. These activities will greatly enhance your students' field trip experience and are also a lot of fun!

We look forward to your students' arrival and are excited to provide them with a fun and educational experience. If you have any questions, please call us at 731-3140.

Suggested Grade Level(s): 2nd and 3rd
Program Objectives:

- Students will relate the basic parts of a plant to the function(s) of each part in making a plant "work."
- Students will begin to understand the uniqueness of and the process behind photosynthesis, including the basic ingredients needed.
- Students will learn how animals (including humans) depend on plants in terms of food and shelter.
- Students will be taught the importance of flowers for future generations; they will also learn the basics of pollination.

Pre- and Post-Trip Activity Suggestions

Bag a Plant!!

Adapted From *The Growing Classroom*

Concept: Students will observe, firsthand, the process of transpiration.
Suggested Timing: Pre-Trip
Time: 30 minutes
Location: Indoors
Materials: A well lighted windowsill or grow light; plastic bags; rubber bands; 2 living house plants (same size and variety); one identical pot with soil only; celery stalk with leaves or a white carnation; jar of water; food coloring.
Procedure: Discuss how people get water and how our bodies lose water (perspiration, respiration). Have students breathe into their hands or on a window to see how water vapor in their breath condenses. Discuss how plants get water and how they lose water.

Plants don't breathe the same way as humans but they do lose lots of water vapor through their leaves. This is called transpiration. Set the three pots on a sunny windowsill and label the potted plants "A" and "B" and the plantless pot "C".
Water all containers with equal amounts of water. Wrap pots A and C in clear plastic bags that cover the entire pot and plant (pot A) or just pot (pot C). Tie a plastic bag around plant B with an opening for the plant (the plastic bag goes around stem of the plant and covers the soil only). Wait at least one hour. Examine the three containers. You should see condensation on the inside of all three bags.

Which pot produced the most moisture? Why do you think that it did so? Water can evaporate both from the soil and from the plant, but the plant has the most surface area.

Allowing water to evaporate from the leaves of a plant causes the roots below to suck up more water. This draws water and nutrients up from the soil and into the plant. As water heads back through the plant it takes sugar made in the leaves along with it. Review where the water in the plant comes from. You should have a discussion about roots and how they absorb water. If you can, have students dig up a very small amount of grass to examine the roots.

To demonstrate how water moves up a plant stem, cut the end of the celery stalk or the white carnation stem at a slant with a sharp knife, place the celery stalk or the white carnation in a jar of water that has been colored, and put it near a warm, bright windowsill. The next day you should see coloring in the celery stalk and leaves or the white carnation. This demonstrates how the water has moved up the stem of the plant as water evaporates out of the leaves.

Green Magic

Concept: Students will learn how chlorophyll helps to make sugar for plant food and how, when chlorophyll is conserved in the fall, the hidden colors of leaves are seen.
Suggested Timing: Pre-Trip
Time: 30 minutes
Location: Indoors
Materials: fresh spinach, large cup, coffee filter, fingernail polish remover, blender (optional)
Procedure: Ask the students how plants make food. Some students may answer that it is through the sun's energy. Explain to the students that the reason plants are green is because they have a special pigment called chlorophyll. This pigment helps the plant absorb the sun's energy and puts this energy to work making food.

You will now separate the chlorophyll from a spinach plant's leaves. Place a very small amount of water in the blender and grind a significant amount of spinach leaves to a nice pulp. Pour a small amount of this green pulp into a cup. Mix fingernail polish remover with this pulp and stir. Now ask the students what happens to leaves in the fall (the leaves change colors before falling off). The yellow colors that you see in leaves are normally covered up by green chlorophyll. What do you think happens to that chlorophyll in the fall? Some of it is broken down, but much of it is absorbed in the stems of trees and bushes for use next spring. Chlorophyll is very difficult for plants to make so plants save it.

Cut a strip of coffee filter and place it in the fingernail polish/ spinach solution. Wait about thirty minutes. The solution will move up the coffee filter. As it is absorbed, the pigments in the spinach leaves will separate out. You will see a distinct green and a distinct yellow band, with some color bands in between. This yellow band is the yellow pigment that is always in leaves. The green band contains the chlorophyll.

As an extension, head outside during the spring and look for different shades of green in various types of plants. You may notice that the leaves of plants growing in bright sunlight, where they get lots of energy, are smaller and lighter in color than those that are growing in the deep shade. This means they have less chlorophyll. Leaves that grow in bright sunlight need less chlorophyll to survive because they get plenty of sunlight but they must have other adaptations to keep them from drying out. See if you can find examples of many leaf shapes and shades.

Roots, Stems, Leaves, Bark, Flowers, Fruits and Seeds

Adapted from *The Growing Classroom*

Concept: By comparing a variety of plant foods, students will understand which parts of plants common vegetables, spices, and fruits come from.
Suggested Timing: Post-Trip
Time: 45 minutes
Location: Indoors
Materials: Fruits, vegetables, spices, chalkboard and chalk, dip base (such as plain yogurt)
Procedure: Ask students to bring all types of fruits, vegetables and spices to class. Collect as many different varieties as possible. Review the parts of a plant with students and have students diagram a plant with its parts on the board. Discuss with the students how plants make their own food, and food for us, using the sun's energy.

Ask students to bring their plant foods to the front and begin making a list of these foods on the board. Place the names of the plants these foods come from next to each item. Create a chart on the board, based on the headings you see in the example chart below. Then, have students categorize these foods into their proper categories in the chart.

Roots	Stems	Bark	Leaves	Flowers	Fruits	Seeds
Carrot	Celery	Cinnamon	Basil	Broccoli	Tomato	Pepper corns
Onion	Kohlrabi	-	Parsley	Cauliflower	Eggplant	Dill
Radish	Rhubarb		Spinach	-	Apple	Caraway
Ginger	-		Lettuce		Banana	Chocolate
			Mint		Orange	Beans
					Strawberry	Rice
					Hot Peppers	Wheat

Plants With Hands

Concept: Students will conduct an experiment with climbing peas to observe the plants' use of tendrils. They will explore the concept of adaptations.
Suggested Timing: Post-Trip
Time: 30 minutes to start the experiment, continual observation
Location: Indoors
Materials: Sunny windowsill, climbing pea seeds, pots, sticks, potting soil, twine
Procedure: Have the students sprout two climbing pea plants. As soon as they have sprouted, move them to a sunny windowsill. Place a 12" stick in one of the pots next to the plant. In time, this pea plant should grow around the stick. After the plant has grown around the stick, place a larger stick next to the first stick and tie a large piece of twine to the larger stick and to a nail or window ledge. The pea plant should grow up the twine toward the windowsill. Have the students observe and draw pictures of the progress of both plants.

As a concluding activity, ask the students how climbing tendrils would help the pea plants survive in the wild. What other types of plant adaptations can they think of? If possible, take students outside to search for unique plant adaptations.

Sources

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