Children's Museum of Houston

Pre/Post Classroom Activities

The Great Pollinators

Rationale

EcoStation is an active, outdoor/indoor environmental exhibit where visitors engage in ecological studies and explore environmental issues by visiting a native plant garden, a woodland area, the bayou table, the pond and a research pavilion. Through these and several other exhibit areas, visitors can participate in diverse hands-on activities such as stream bed creation, insect collecting, tree rubbings, footprint identification, and more!

TEKS Objectives (Science)

2.1, 3.1, 4.1, 5.1: The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.
2.2, 3.2, 4.2, 5.2: Gather information using simple equipment and tools to extend the senses.
2.6C: Observe and record the functions of plant parts.
2.9A: Identify the external characteristics of different kinds of plants that allow their basic needs to be met.
3.9, 4.9, 5.9: The student knows that species have different adaptations that help them survive and reproduce in their environment.
3.10, 4.9, 5.10: The student knows that many likenesses between offspring and parents are inherited from the parents.

Background

Image below from: http://www.srgc.org.uk/bulblog/log2006/251006/log.html

In this lesson plan, children become familiar with the parts of a flowering plant's reproductive system and explain how flowering plants depend of pollinators for survival. Pollination is the act of transferring pollen grains from the male anther of a flower to the female stigma. The goal of every living organism, including plants, is to create offspring for the next generation. How does pollen get from one flower get from one flower to another? Flowers must rely on vectors, or pollinators, to move pollen. These vectors can include wind, water, birds, insects, butterflies, bats, and other animals that visit flowers. For more information on pollination, see the website http://www.mbgnet.net/bioplants/pollination.html.

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Vocabulary
Flowering plants
Imperfect flowers
Perfect flowers
Non-flowering plants

Materials
- Various flowering plants with flowers (roses, lilies, dandelion, sunflower, watermelon, etc.)
- Chart- Pollinators and How Flowers Attract Them
- Flower Characteristics Data Table
- Flower Shapes Chart
- Hand lenses
- Pencils

Procedure
After an introduction to the different types of pollinators and how flowers attract them, students will be ready to investigate different flowering plants and determine the types of pollinators that pollinate for them. This activity is best if completed in small groups of 2-4 students.

1. Prepare lesson by setting up stations each with various flowering plants (make sure all plants are labeled), hand lenses, charts, and data tables with pencils.
2. Students will take turns choosing a flowering plant to investigate and write the name of that flowering plant on their data table.
3. They will compare the shape of their flower to the Flower Shapes Page and record the shape of their flowers on their data tables.
4. Students will record the color and odor of their flower of the data table.
5. Based on the information students recorded on their flower, they will use the Pollinators and How Flowers Attract Them chart to determine the types of pollinators their flowers might have.

Questions to ask
- How many of these flowers can you find at a park or in your neighborhood?
- What types of pollinators might these flowering plants have?
- How do you think the shape of a flower would affect how the flower is pollinated?
- What would the advantage of animal or insect pollination be over wind pollination (when the wind blows pollen through the air)?

Extensions
Ask students to take a walk in a local park or neighborhood and create a journal of the different types of pollinators with the flowers that they pollinate they observe.

Resources
- Bats by Sylvia A. Johnson. Describes the varied characteristics and habits of bats and the importance of their roles as pollinators and seed dispersers.

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- Roses Red, Violet Blue: Why Flowers Have Colors by Sylvia A. Johnson. Excellent teacher resource that examines the nature and function of flower colors and explains their role in attracting animal pollinators to help the plants reproduce.
- The Magic School Bus Plants Seeds by Joanna Cole, Bruce Degan, Patricia Relf. While on their adventure, Ms. Frizzle's class learn about the parts of a flower and how a seed is made.
- Plants by Jackie Ball, Denise Vega, Uechi Ng. Describes the appearance, life-cycle, pollination, food, and development of the amazing plants all around us.
- Eye Wonder: Plant by DK Publishing, Fleur Star. Examine what a plant is, find out how plants support all other life on the planet, and discover their tricks of attracting pollinators and the secret weapons they use to keep predators at bay.
- The Reason for a Flower by Ruth Heller. Explains plant reproduction, the purpose of a flower and presents some plants which don't seem to be flowers but are.

Websites

- BrainPop: Pollination www.brainpop.com/science/cellularlifeandgenetics/pollination/. Provides educational movies that help make learning fun. In this movie, Tim and Moby explain pollination and the pollinators in which flowers depend on.
- Biology of Plants: Pollination www.mbgnet.net/bioplants/pollination.html. Provides a great resource of information for teachers to use to better understand pollination with a clip of a hummingbird taking nectar from a flower.
- Pollination and Plant Families www.biology.clc.uc.edu/courses/bio106/pollinat.htm. Provides a great resource of information for teachers to use to show students the different pollinators and the types of flowers they pollinate from.
- US Forest Service: Pollinators http://www.fs.fed.us/wildflowers/pollinators/index.shtml. Provides in depth information about different types of pollinators and the types of flowers they pollinate from along with other valuable resources.

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Flower Characteristics Data Table

Flower Name	Flower Shape	Flower Color	Flower Odor	Likely Pollinator

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Flower Shapes

Trumpet	Bell	Tube	Wheel
			
			
			

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Pollinators and How Flowers Attract Them

Pollinator	Flower Shape	Flower Color	Flower Odor
 Bats	Bell or wheel and open at night	Dull white, green	Musty or fruity
 Birds	Tube or trumpet	Bright red, yellow, orange	None
 Beetles	Large wheel	White, dull reddish-brown	Spicy or like rotting fruit
 Flies	Various	Drab, colorless or green	Foul odor
 Bees	Wheels	Blue, yellow, purple	Sweet
 Butterflies	Tube or spurred	Blue, yellow, red, orange, pink	Sweet
 Moths	Tube or sometimes without petals	White or bright colors visible at dusk	Sweet after dusk

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