Prairie Ecosystem Program

Post Field Trip Resources

Standard: Prairie Root Size Comparison

12.7.15 Identify the common characteristics of plants and plant growth. Understand the purpose of various plant parts such as roots, stems, and leaves

Investigation Question: How Deep Are Prairie Roots? Why does this adaptation help them to survive in the prairie?

Activity Description: Students will work as a group to create visual representations of the depth of different prairie plants.

Materials Needed: Prairie Plant examples chart and diagram (image available: http://www.dupageco.org/assets/0/14/382/442/463/2748/2837/2089817d-c342-49ce-85aa-d86ce2470975.png), chart paper, markers, rulers/meter sticks and comparison choices (ipad, pop can, ipod, hair straightener, etc).

Procedure:

1. Students will be divided into groups of 3. Each group will receive different a different prairie plant. Prairie plant examples: Compass Plant, White Wild Indigo, Prairie Drop Seed, Big Blue Stem, Purple Cone Flower, Indian Grass, Lead Plant, Rosin Weed, Switch Grass.
2. Using the given data chart, students will be asked to use chart paper to diagram the size/length that their prairie plant's root depth (at maturity).
3. Students choose one of the following 3 items: a pop can, hair straightener, iPhone/iPad or other object of student's choice.
4. Students will measure the length of their object. If it is something that you think students may not have in class, you may ask them to bring it in ahead of time.
5. Students will calculate the # of their items needed to represent their prairie plants root depth.
6. Students will create a visual representation of how many of their chosen item they would need to represent the depth of a prairie plant root. For example: The Compass Plant can reach 15 feet deep into the ground therefore if a hair staightener is ~1 foot then the compass plant could reach up to 15 straighteners (stacked end to end) into the ground.

Extension: Have students create a graph of the data and discuss the benefit of having prairie plants at different depths.

Prairie Plan	Average Root Depth for Mature Specimen
Little Bluestem Grass	6 to 7 feet
Compass Plant	15 feet
White Indigo	7 feet
Prairie Drop Seed	5 feet
Big Blue Stem	10 feet
Purple Coneflower	5 feet
Indian Grass	10 feet
Lead Plant	14 feet
Rosin Weed	8 feet
Switch Grass	11 feet

Discussion Questions

- What are the benefits for prairie plants to have such deep roots? How does the abiotic data that you collected in the field, connect to this adaptation?
- Why would it be beneficial for different prairie plants to have different root depths in the same plotted area of a prairie?
- Is there any correlation between root depth and stem height? Why do you think this connection is there? Why not?

Extension:

- Use the image (http://www.dupageco.org/assets/0/14/382/442/463/2748/2837/2089817d-c342-49ce-85aa-d86ce2470975.png) in order to calculate the percentage of each prairie plant's root system when compared to the entire length of the prairie plant. For example: On average the compass plant reaches a root depth of 15 feet and stem height of 7 feet. Since the plants total length is 22 feet, you could calculate that ~68% of the plants length is found in its root system.
- Student can graph the root length of each species, AND the % of root length across species as well.
- Which plants have a greater % of stem height compared to root height? How does this data reflect the adaptations needed by prairie plants to survive?