



Land Explorations (Forest Ecosystems)

Students will use chemistry and mathematics as a tool to help examine a forest ecosystem. They will also actively participate in a service learning project by helping to remove exotic, invasive plants.

TOPICS: Soil chemistry, transect line, photosynthesis, exotic invasive species, bio-diversity

BACKGROUND INFORMATION:

Rock Creek Park's 2000 acres contains one of the last remnants of the forest ecosystem that once covered the area. Not only are forests threatened by the growth of the city, they are also affected by farm, industrial, construction and home runoff and by invasive exotic plants.

To learn about the health of a forest, scientists use a variety of tools. Two of those tools are chemical testing of the soil and surveying transect lines. Because both nitrogen and phosphorus are critical to plant growth, the amount of each present in the soil directly correlates to the carrying capacity of the soil. The acidity or pH of the soil reveals what types of plants can survive. A transect line can be used to learn a lot about the vegetation, including what the dominant species are, where exotic species are present, and what the overall bio-diversity is in the forest.

Invasive exotic species is one of the largest problems facing Rock Creek Park. In most cases, exotics do not have predators and therefore spread fast, out-competing native plants. This results in less bio-diversity and a loss of habitats for animals. Therefore, during this program, students will not only use the scientific tools to observe the forest, they will actively participate in an exotic plant removal.

Where: Rock Creek Park, either at the Nature Center or another pre-arranged location.

Length: 2 hours

Who: 7th-12th grade classes

Students per group: maximum of 30

Chaperones per group: 3-5

OBJECTIVES: By the end of the program, students will be able to;

1. Identify two components of soil.
2. Define bio-diversity.
3. Name one invasive exotic species.
4. Describe the importance of resource management.

SAFETY AND RESOURCE MANAGEMENT MESSAGE:

1. Avoid Poison Ivy.
2. Do not harm, harass or remove any native plants or animals from the park.



Land Explorations

(Forest Ecosystems)

Pre-visit activities

We would really like to make **Land Explorations** an integral part of your lesson plan on chemical analysis, bio-diversity, environmental issues, or the risk and benefits of actions. Therefore, we have included some pre-visit activities to introduce the idea of bio-diversity and exotic species as well as to encourage the students to think about how they may influence the future. Prior to your visit to Rock Creek Park, please take a moment to read this pre-site. We suggest that you do one or more of the described activities with your class.

Pre-visit:

1. Ask each student to research an invasive exotic species and fill out a profile sheet on it. A list of the exotics at Rock Creek is enclosed.
2. Pass out the Bio-diversity worksheets and allow the students to work individually and silently for ten minutes on it. Open the class up to a discussion afterwards.
3. Using small groups, ask each group to develop recipe for soil. Pass cups of soil around to give them ideas. Components include wood, bark, dead organic matter, decomposers, fungi, water, air and rock. Next, ask the students what type of chemicals should be found in soil. Nitrates, Phosphates, Potassium, Magnesium, Sulfur, Carbon, Hydrogen, Oxygen are found in high concentrations. Magnesium, Iron, Boron, Copper, Zinc, Molybdenum and Chlorine are found in much lower concentrations. Trace elements include Cobalt, Iodine, Fluorine, Sodium, Lithium and Aluminum. Identify each of these on the periodical chart and discuss with the class why some of them are particularly important.



Exotic Invasive Species Profile

Scientific Name:

Common Name(s):

Habitat (wetland, forest, old field, estuary, etc.):

Country/Region of origin:

When/where/how introduced to North America:

How is it spread in North America:

Impact(s) on the environment:

Beneficial characteristics: