



Course: AP Environmental Science

Course Description

The goal of the AP Environmental Science Course is to provide students with the scientific principles, concepts and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human made, to evaluate the relative risks associated with these problems and to examine possible solutions for resolving or preventing them.

Unit Name

Field investigation: Long Term Ecological Research (LTER)

Unit Description

Students will establish research plots in an urban forest located one mile from the classroom. They will learn to identify and accumulate data on native and invasive species of plants, birds and earthworms found in their plots. Students will partner with local experts to gain the skills they need in the field. Local officials and residents are managing this forest to reduce the prevalence of invasive species and replant native species of plants. Students will visit their plots once per week during warm and mild weather months to survey and assess the results of these activities. Their resulting research will be passed to the next years' AP environmental science students and shared with Saint Paul Parks. Another goal of this unit is to increase students' level of environmental and community stewardship.

Critical Science Concepts

Phenology, biodiversity, invasive species, ecological succession, forest ecosystems, species interactions, environmental adaptations, land use management, environmental decision making

Minnesota State Science Standards met by unit

- The student will understand the nature of scientific ways of thinking and that scientific knowledge changes and accumulates over time. (MASS I A 9 a 0)
- The student will design and conduct scientific investigations. (MASS I B 9 a 0)
- The student will understand the relationship between science and technology and how both are used. (MASS I C 9 a 0)
- The student will investigate the impact humans have on the environment. (MASS III A 9 b 0)

- The student will describe how the environment and interactions between organisms can affect the number of species and the diversity of species in an ecosystem. (MASS IV C 9 a 0)

Overarching Questions

- How do invasive species affect a woodland habitat?
- How successful are forest rehabilitation efforts?
- How do plant-animal interactions affect biodiversity?

Sample learning activities and lessons

- Quadrant analysis
- Plant identification and survey
- Birding identification and survey
- Earthworm identification and survey

Suggested time

Ongoing with principle time allotted in fall and spring during bird migration and periods of identifiable plant foliage

Suggested connection with other units

Ecosystems, population dynamics, biodiversity, soil, land management, preserving animal diversity

Resources: Materials, technology and community

- Community:
 - Como Woods Outdoor Classroom
 - Saint Paul Parks
 - Saint Paul Audubon Society (SPAS)
 - Anoka-Ramsey Community College
 - Eco Education
 - University of Minnesota Forestry Department
- Technology:
 - GPS units
 - GIS software
 - Digital cameras
 - Soil thermometer probes
- Materials:
 - Binoculars
 - Minnesota bird guidebook
 - Invasive species key
 - Minnesota tree key
 - Minnesota plants key
 - Compass