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Environmental Learning Center of Goshen College

Water Quality
9th - 12th

Program Description
What, if anything, is wrong with our water? How did it get that way? What can be done about it now? Students address these questions using modern equipment and techniques to conduct water sampling experiments. Explore a lake ecosystem in canoes and waders to assess biological indicators, pollution, siltation and human impacts on water quality.

Program Objectives
Students will:
- Explore a lake ecosystem using canoes and waders
- Conduct sample field tests used by professionals for a variety of water quality parameters
- Sample for aquatic macroinvertebrates, learn to identify them and utilize this data as an indicator of water quality

Program Outline
Students rotate in groups through four different activity stations:
1. Wetland Dipping: Students use waders and nets to dip for aquatic macroinvertebrates in a lake ecosystem.
2. Wetland Lab: Students use microscopes and field guides to identify aquatic macroinvertebrates. Then students explore how this data can be used to determine the water quality of the lake at the time of the program.
3. Canoeing: Students partner up and use canoes and scavenger hunts to do a physical assessment of the lake's health.
4. Water Quality Testing: Students practice using field tests for water quality parameters like dissolved oxygen, pH and nitrogen.

Vocabulary
- Water quality
- Macroinvertebrate
- Dissolved oxygen
- Turbidity
- Pollution Tolerance Index

Quick Facts

Season Fall: September - November
Spring: April - May
Summer: June

Grades 9th - 12th

Program Length 4 hours

Maximum # of Students 35 Students

Standards Correlation

LS2.C: Ecosystem Dynamics, Functioning, and Resilience: A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability. (HS-LS2-2),(HS-LS2-6)

LS4.D: Biodiversity and Humans: Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value. (secondary to HS-LS2-7) (HS-LS4-6)

ESS3.C: Human Impacts on Earth Systems: Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)

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