Cary Institute of Ecosystem Studies

Eco-Blitz

The schoolyard as an ecosystem

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Objectives
- Students distinguish between living and nonliving things.
- Students observe, record and synthesize data describing the living and nonliving things in their schoolyard
- Students use their data to create a mural of their schoolyard ecosystem.

Grade Level: 3-5

Duration:
Day 1 – 2 hours
Day 2 – 1 hour

NY State Standards addressed

NY State: Elementary standards for math, science and technology:

Standard 1 (Analysis, inquiry and design):
- Observe and discuss objects and events and record observations
- M1.1c Apply mathematical skills to describe the natural world
- S1.3 Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.
- S3.1 Organize observations and measurement of objects and events through classification and the preparation of simple charts and tables.

Standard 4 (The Living Environment) major understandings:
- Diversity of populations within ecosystems relates to the stability of ecosystems
- The fundamental concept of ecology is that living organisms interact with and are dependent on their environment and each other. These interactions result in a flow of energy and a cycling of materials that are essential for life
- Human decisions and activities have had a profound impact on the physical and living environment

Standard 6 (Interconnectedness):
- Observe and describe interactions among components of simple systems

Vocabulary may include:

- **ECOSYSTEM** – the relationship between biotic (living) and abiotic (non-living) factors in an environment.
- **MICROCLIMATE** – the climate of a small specific place within an area as contrasted with the climate of the entire area.
- **NUTRIENT CYCLING -** the movement of chemical food through an ecosystem, especially nitrogen (N), phosphorus (P), potassium (K), calcium (Ca) and magnesium (Mg). These chemicals come from weathering rocks, decomposing plants and animals, and fertilizers. We eat these nutrients, too!
- **DECOMPOSITION**- the breaking down of dead plants and animals into simpler nutrients.
- **ECOSYSTEM SERVICES -** resources and processes which are carried out by natural ecosystems, including the breaking down of dead plants and animals, crop pollination and clean drinking water.
- **INTERACTION WEB –** a web of the many ways that organisms' have relationships in an ecosystem, including predator-prey, plant-pollinator, and parasite-host.
- **BIODIVERSITY –** the range of organisms present in a particular ecological community or system.

Program Synopsis
Day 1:

Introduction to Cary Institute and how our ecologists define ecosystems.	5 minutes
Review of Eco-Blitz stations	10 minutes
Students rotate through several mini-research stations to collect data on living and nonliving factors in the schoolyard. Stations may include*: • Microclimate station – students collect data on air temperature, soil moisture and temperature, wind speed and light intensity in different parts of the schoolyard • Soil station - students investigate what makes up soil and collect data on decomposition rates • Insect station – students collect, count, and identify flying and ground-dwelling insects • Larger animal life station – students identify, count, and record signs of birds, amphibians, reptiles, and mammals • Plants/Seeds station – students locate and identify trees, plants, flowers and their seeds.	1.5 hours
Wrap up and review of schoolyard as an ecosystem.	15 minutes

* We have extensive experience in urban, rural and suburban schoolyards and able to adapt these stations to fit the nature of the schoolyard and the curricular goals of the teacher.

Day 2:

Review of project/observations/questions	10 minutes
Students report and organize data	20 minutes
Students create wall mural to represent collected data	30 minutes
Group discussion about interactions among the organisms using wall mural	30 minutes

Possible extensions/adaptations for this schoolyard investigation include:

- Conducting eco-blitz investigations during different months in the schoolyard to compare seasonal changes in interaction webs.
- Creating a long term ecological monitoring project, whereby student groups monitor their schoolyard dynamics over many years. Long term research programs provide many unique opportunities for enriching graphing and analysis exercises.
- Creating student driven investigations on interesting topics discovered during the eco-blitz investigation.