

Exploring Your Ecosystem

Subject: Life science, writing

Grade: 6-8

Lesson Topic: Ecosystems

Length: 1+

Learner Objective:

Students will apply concepts and vocabulary learned from the previous lesson (*Exploring Ecosystems in Your Classroom*) to an area on their school grounds, their community, or in they're nearby National Park.

Introduction:

This activity is intended to supplement the regular life science ecosystem units normally taught. It provides the classroom teacher with the necessary vocabulary and concepts common to the study of ecosystems, provides an activity that may stand alone or be added to the regular curriculum and can be used to transition from a broad approach of ecosystem study to one that incorporates alien weed species as the integrating context by which students study the dynamics of ecosystems in their own community.

Content:

Ecosystems include all the biotic (living) and abiotic (non-living) things in a particular area that interact with each other. Within each ecosystem these thing are intimately entwined in a variety of interrelated cycles: the water cycle, energy cycle, nutrient cycle, chemical cycles, and are affected by the cycles of the seasons. All living things exist connected to each other in an intricate web of life and have specific roles as producers, consumers, or decomposers.

Materials and Supplies:

Ecosystem Journal (see *Exploring Ecosystems in Your Classroom*)

String or hula-hoops to designate study area

A range of supplies may be required depending on the depth of their investigations (hand trowels, sifters, thermometer, scales, ID books, etc.)

Anticipatory Set:

Standing outside with a hand trowel, look around and ask the students, "Now, where can I find an ecosystem?" Lead a discussion that concludes with the fact that an ecosystem may exist anywhere that living things interact with each other; from a hand trowel full of soil to the earth's biosphere.

Activity Outline:

Have the students define an area as their own ecosystem for study. Use surveyor's stakes and string to delineate an area. For younger children (or a quick version of this activity) use hula-hoops to designate the areas of study. The study site

should be measured to calculate the area (math skills). If you are ready to start a larger study, or are working in conjunction with the education specialist at a national park, you may want to break the area into a grid and randomly assign each section to a student.

- Make observations about the site in their journal. They may also draw a map or sketch of the area, or use digital photographs (make sure the point where the photograph is taken is measured in distance and cardinal direction from the site).
- Inventory all biotic and abiotic aspects. Where possible, and depending on grade level, the total population of each species should be counted, and in the case of plants, the percent coverage should be determined.
- Soil samples can yield a variety of information depending upon the resources available for testing. Living creatures can be screened from the soil (be sure to return them unharmed!) and other procedures exist for extracting nematodes and microscopic organisms from the soil. The soil can be tested for percent of organic material, percolation rates, pH, composition, and type.
- Students should explore how survival needs are met by each species within their plot (Hint: have them think in terms of air, water, food, and sunlight).
- Observe and/or infer influences by humans. If humans shaped or altered the ecosystem, *when* did it occur and *how* might it have occurred.
- Are there plants or animals in their plot that could not live in the plots being examined by their peers? Investigate the differences and similarities between student plots and determine if they are the same, if they influence one or another, if they are uniquely different. For small plots in a small area, try having the students create a web of connections by tying a string to a plant chosen at random and then connect all abiotic and biotic things in all the plots. Can they all be connected? (this activity can also serve as an assessment).

Closure and Assessment:

Student journals can be used to assess understanding of key concepts. Their observations and reflections should utilize the above vocabulary. Journals kept over a period of time should demonstrate a movement from inference to true observation. Students may also exhibit understanding through oral presentation of the ecosystems they created.

Independent Practice and Related Activities:

Students may wish to expand their studies of classroom ecosystems by recording specific data (temperature, moisture, plant growth, mortality, pH, etc.) over time, by manipulating variables, and by developing and testing hypothesis through experimental design and process.

(These aspects of research may be used to adapt this lesson plan to upper middle school and high school classes)

Resources:

Written and Illustrated By: A Revolutionary Two-Brain Approach for Teaching Students How to Write and Illustrate Amazing Books by David Melton, 1985, published by Landmark Editions. ISBN: 0933849001

Vocabulary:

Abiotic, Biotic, Ecosystem

National Science Education Standards:

Science as Inquiry - CONTENT STANDARD A:

As a result of activities in grades 5-8, all students should develop

- ☐ Abilities necessary to do scientific inquiry
- ☐ Understandings about scientific inquiry

Physical Science - CONTENT STANDARD B:

As a result of their activities in grades 5-8, all students should develop an understanding of

- ☐ Transfer of energy

Life Science - CONTENT STANDARD C:

As a result of their activities in grades 5-8, all students should develop understanding of

- ☐ Structure and function in living systems
- ☐ Regulation and behavior
- ☐ Populations and ecosystems
- ☐ Diversity and adaptations of organisms