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Classroom Ecosystems: Windows on Our Environment

Guide for Curriculum Unit 92.05.04
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My unit this year was created to help my students develop an understanding of their relationship with their environment, and a respect for how the everyday things they do effect that environment. I am a special education teacher in the Hill area of New Haven, and as such I am constantly being challenged to find new ways to motivate my students in learning about the various aspects of science while still being considerate of students' limitations. These students always are most attentive to, and thus learn the most from, hands-on learning situations. This unit on ecosystems allows students to experience nature first-hand while learning about it.

This unit was designed to be taught in parts, with each section taught during the corresponding season, allowing students to relate what they are learning directly to what is happening in their neighborhood. My unit begins with a discussion of the terms ecology, environment and ecosystems, including looking at definitions and examples of each and exploring their many variations. For example, after talking about ecology as a term describing the study of how plants, animals, and their biological and physical environments interact and how they influence one another, students will be encouraged to apply that description to realms of varying size: the Earth as a whole, the United States, Connecticut, New Haven, a city block or playground, their school yard or back yard of their home, and to a miniature environment created in the classroom.

This unit will help students begin to understand the system of balances and cycles and dynamic interchanges found in nature. They will be exposed to the idea that many things in nature proceed in regular order and that this order aids in keeping a balance in nature.

In addition, each animal has certain requirements for life. All need an environment which can provide them with the right amount of water or moisture and proper temperatures for survival. The environment acts on living things, and they interact with the environment around them in a process of building up and tearing down which is necessary to maintain an equilibrium in nature.

Hands-on work with bottle ecosystems will allow students to make first-hand observations about the constant interchange between an organism and its environment. We will be using bottle ecosystems which are derived from the students' environment to do most of the research of this unit. Fall discussions will center on what changes occur in plants and trees in Autumn—decomposition and composting—and what seasonal occurrences will have an effect on the neighborhood ecosystem.

During the winter season, we will return our attention to this unit and students will think about varying the

environments in which they store their soil samples. Discussions at this time will center around winter dormancy, and, since there is not a great deal of observable data at this season, discussion of the four major cycles of most ecosystems: carbon, oxygen, nitrogen, and hydrogen. Students will continue to record on charts any observations they have made, or new predictions they would like to add.

With spring, students will change the nature of their ecosystem. At this time we will open the bottles closed in fall, and note what has happened. We will use the soil samples in their bottles to plant seeds or small plants. Worksheets and charts will be used to record observations, note changes made, and add new predictions students suggest. Data collected to this point on previous charts will be compared with actual findings within the bottles, and explanations explored. Students will share and compare findings with one another.

At this point, bottles will be converted into planters and students will observe and record future growth in their environment. Discussions during spring will include not only plants and their environmental needs for growth, but also the consequences in ecology of many human actions.

As school comes to a close, students will be asked to make predictions about what will happen to their plants over the summer, and what conditions will change during that season and affect the plants' growth.

As a culminating activity students will take home healthy plants to be added to their home environments and will talk with parents and relatives about the lessons they have learned. A classroom open house with students talking about charts, findings, new information they have learned and samples of their ecosystems translated into drama, music and dance will demonstrate understanding of the unit.

(Recommended for elementary or middle school Science)

Key Words

Ecosystems Ecology Environmental Science Studies Special Education