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# OUTDOOR EDUCATION AT KNOXVILLE

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## Introduction

Many of the outdoor science activities at Knoxville wouldn't be possible if it weren't for the unusual arrangement of science classes. Students in the environmental science class, which meets during the fall semester, and the field biology class, which meets in the spring, attend class twice a week for two hours straight and once on Friday for one hour. All students are required to either take one of the field classes or general chemistry, as well as a semester in human biology.

The two hour sessions for the field courses offer an excellent opportunity for extended outdoor study. A bus has been provided by the district for use by the science department, and as the field course instructor with a chauffeur's license, I have transportation available for my classes at all times.

## Conservation

Many of our outdoor activities are ones used by most high schools. However, there are a few that are somewhat unique. Each fall the environmental science classes do a unit on soil-conservation. After studying the soil conservation problems of Iowa in general and of Marion County specifically, and after completing work with the Soil Conservation Service involving soil erosion control measures, the students then prepare soil conservation plans. Each class is assigned a farm from a list of farmers who have either requested the SCS to prepare a plan or who have called the school to ask the science classes to prepare one. Over the next two weeks, students do field study on their assigned farm and prepare a complete soil conservation plan.

Often a wildlife planting or a windbreak is recommended as part of the plan. If the landowner decides he would like trees planted in these areas, the Science Club orders the trees from the Conservation Commission. In the spring, members of the Science Club and field biology classes return to the farm and plant the seedlings free of charge. This program has led to the planting of 36,000 seedlings on 32 farms over the past two years.

During the fall semester, environmental science students visit past windbreak and wildlife plantings to record information on survival rate, growth rate and changes in soil nutrient content. This project allows the students to combine the skills they have obtained in tree identification and soil sampling lessons. In the future, classes will also gather information concerning wildlife populations in these areas.

## Prairie Establishment

The botany and zoology classes are just beginning their major outdoor project for the future: prairie establishment and renovation. In this new project students are learning to identify prairie grasses and forbs and have located several small remnant prairie areas on or near land owned by the Army Corps of Engineers near Red Rock Reservoir. The Corps is very anxious to have students working in these areas and has set them aside for our use. In addition, we will be working with the Corps helping establish prairie species on other land around the Reservoir.

Our prairie establishment program also got a boost when a local landowner set aside 40 acres of farm land for the Science Club and science classes to develop into a model wildlife area. Seed was obtained from the Conservation Commission, and seven acres of this area were planted to prairie grasses last spring. The botany class will be working to establish as wide of a variety of prairie species as possible in this area. The class, along with the field classes, will be gathering seed along railroad right-of-ways, roadsides and from land owned by the Corps of Engineers. The botany class will be working on propagation and transplanting while using the high school's green house and is also experimenting with tissue culturing some of the species that are difficult to start from seed. The tissue culturing project was begun last year following a visit by Science Club members to South Dakota State University, where they got first-hand experience in the methods used with considerable success at the University. The information they obtained in this visit is now being used to start our own tissue culturing project.

I expect the prairie areas to offer many opportunities in the future for new outdoor study activities including the comparison of small mammal, bird and insect populations on the prairie areas with those on adjoining agricultural land.

### Nesting Study

As spring approaches, the field biology classes work with ornithologist Gladys Black of nearby Pleasantville. Gladys has been studying a 60-acre blue grass pasture for the past 22 years.

For the last two years Knoxville's science classes have been helping with a nesting study in this area. We have divided the 60 acres into four 15-acre sections and assigned a field biology class to each area. We visit the site once a week during the last six weeks of school and try to locate every nest in the pasture. Records are kept for each species concerning arrival dates, beginning of nesting activity, number of eggs laid and hatched, and yearly population fluctuations. This project allows the students to get first-hand experience in the study of territoriality, carrying capacity, predation and identification of the various song bird species by sight, song and nest characteristics.

Nesting report cards are kept on every nest and sent to the College of Ornithology at Cornell University in Ithaca, New York. This information, as well as information from the 200 bluebird houses built by the

classes and placed on Marion County farms two years ago, is beginning to give us some valuable information concerning song bird populations in our area.

### **Microbiology**

The microbiology classes are also busy in the spring analyzing water brought in by farmers from their wells or from farm ponds. Students also get practical experience by analyzing milk from dairy herds in the area and have the opportunity to work with technicians at the local Veteran's Administration hospital.

### **Science Club**

In addition to its work with the projects already mentioned, the Science Club is involved in several other activities. The Club has organized the Audubon Society Christmas Bird Count for Knoxville and does the night owl count for the census. A new long range project begun last year involves developing nature areas at each of the elementary schools and fitting them into an overall landscaping design. This spring we anticipate planting a nursery on one of the sites as a future source of trees for landscaping projects at all of the schools in the district. This activity involves close work with the elementary students and their instructors in all phases of the project including the care of the plantings throughout the entire year.

### **Elementary Science**

Our involvement with the elementary school students is one of the most important aspects of our science program. During the past two years, the botany and zoology classes have worked with elementary classes in stocking fish in farm ponds, tagging monarch butterflies and studying pond organisms. The field biology classes give instruction on wild edible plants and woodland wildflowers each spring on the county's sixth grade conservation day and also do a tree identification unit with all of the fourth grade students. The field biology students also present lessons on the needs of wildlife in all of the elementary classrooms each spring during National Wildlife Week.

### **Field Trips**

As the school year comes to an end, perhaps one of the most rewarding experiences of the year approaches for members of the Science Club. Every summer the club takes a three-week trip to some area of the United States and Canada. These trips are designed to give the students first-hand experience working with scientists throughout North America in fields of science they could not usually study in Iowa.

In 1978, the Science Club spent a week canoeing in the Boundary Waters, worked with the Canadian Wildlife Service for a week on Delta



Marsh in Manitoba and studied for a week on the 1700-acre Orduay Prairie in South Dakota. The 1979 trip involved a week studying with the Maryland Marine Resources Department on Chesapeake Bay, a week observing sea bird colonies along the coast of Maine and Newfoundland and a week canoeing in Quebec's Algonquin Provincial Park. This year's trip will be to the Pacific Northwest, although plans are not definite concerning the particulars. The trip will be financed entirely with money raised by members of the club in various fund raising projects. The senior members of the club, taking their third trip, will have studied nearly every ecosystem type in North America and will have had a chance to get to know people with many unusual walks of life.

### Political Science

Our newest project, and probably the most important one we have ever attempted, is to try to organize Science Clubs throughout the state to actively work for passage this year of a bill in the state legislature. Our club would like to see a bill passed, like the one in Missouri, that would set aside 1/8th of one percent of the state sales tax as a means of funding the State Conservation Commission. This plan has had tremendous success in Missouri. If you are interested in this project or any of the programs at Knoxville High School please feel free to contact me at any time.

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### Congratulations

The *Iowa Science Teachers Journal* congratulates Floyd Sturtevant of Ames High School for being selected as the recipient of the 1981 American Chemical Society (ACS) Midwest Regional High School Teaching Award and the 1981 ACS James Bryant Grant Award in High School Chemistry Teaching. These honors are well deserved.

50614

### Two \$200 Cash Scholarships

This year at the Hawkeye Science Fair April 3-4, 1981, there will be two special awards given by the Iowa Association of County Conservation Boards and an anonymous donor. One \$200 award will go to a junior high (grade 7 or 8) student and one award will go to a high school student for outstanding work in the area of conservation of natural resources and preservation of environmental quality. It is hoped that these awards will encourage more students to work in the conservation/environmental field of study. If you have any further question regarding this matter you may contact:

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