DOCUMENT RESUME

ED 075 141 RC 006 917

TITLE	A Handbook for Outdoor Education on the Preserves of the Natural History Section, Nassau County Museum.
INSTITUTION	Nassau County Board of Cooperative Educational Services, Jericho, N.Y.; Nassau County Museum, Mineola, N.Y.
PUB DATE	72
NOTE	30p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Activity Units; Creative Writing; Entomology; Geography Instruction; Land Settlement; Natural Resources; *Outdoor Education; Plant Identification; *Program Guides; *Student Centered Curriculum; *Teaching Guides; Visual Literacy

ABSTRACT

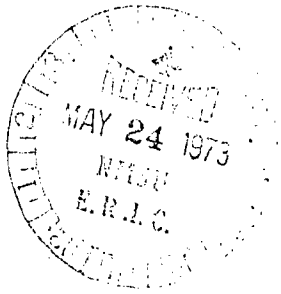
One of the desired outcomes of outdoor education, according to this handbook for teachers, is the development of respect and appreciation for the natural environment and the need to conserve it. It is suggested that since the purpose of going into the field rather than into the laboratory is to study real things in their natural environment, every effort should be made to study living specimens in the field and return them unharmed to the place where they were found. The same holds true for nonliving specimens of scarce natural resources. The handbook outlines 3 stages of preparation for an outdoor education program: a preliminary planning session, the actual planning of the program, and a program orientation session. Also, the purpose, major concepts and understandings, and a description of each sample activity are given. The activities include field succession, pond study, soil ecology, tree identification, forest ecology, insect studies, mapping and surveying, homesteading new land, art in nature, nature poetry, songs of primitive people, and creative writing. Additionally, instructions on how to prepare an outdoor education program, a sample program, resources and references, a field specimen report, a checklist of tree leaf characteristics, winter activities, and conservation projects are included. Also provided is a list of resources and references. (HBC)

A Handbook for

OUTDOOR EDUCATION

on the Preserves of the

NATURAL HISTORY SECTION
NASSAU COUNTY MUSEUM



Prepared by

the

NATURAL HISTORY SECTION
NASSAU COUNTY MUSEUM

Contributors

Francis T. Rice, Museum Educational Supervisor
Kathryne Denston, Museum Instructor
Lorraine Vagner, Museum Education Aide
William Paterson, Museum Naturalist
Arlene Marinello, Teacher, New York City Schools
Carole Niedich, Student, Molloy Catholic College for Women

Cover Art by

Rosalyn Stolin

Printed by

BOARD OF COOPERATIVE EDUCATIONAL SERVICES
Outdoor Education Office
125 Jericho Turnpike
Jericho, N.Y. 11753

1972

THERE ARE TWO WAYS OF LOOKING AT NATURE - -

- One is through the eyes of the *Scientist-Naturalist*
- The other is through the eyes of the *Poet-Artist*.

TABLE OF CONTENTS

A STATEMENT ON THE FIELD COLLECTION OF NATURAL SPECIMENS

A cardinal rule of outdoor education is to leave all naturally occurring phenomena in place so that others may also observe and learn. While the field collection of natural specimens for laboratory study is an essential aspect of scientific inquiry, such activity on the part of individuals or school groups should be discouraged. One of the desired outcomes of outdoor education is the development of respect and appreciation for the natural environment and the need to conserve it. The purpose of going into the field rather than the laboratory is to study real things in their natural environment. Therefore, every effort should be made to study living specimens in the field and return them unharmed to the place where they were found. The same holds true for non-living specimens of scarce natural resources.

Where it is educationally desirable to be able to study a specimen again after returning to the classroom, a photographic record taken during the field trip is often quite satisfactory. Indeed the development and practice of the skills involved in nature photography can be rewarding educational experiences in themselves. Some specimens may be collected in season with little or no damage to the natural environment. For instance samples of fallen leaves, seeds, and other fruits may be collected in autumn. Small samples of pollen, water, and soil may also be gathered discriminately for later analysis. Nonetheless, even in these cases, the educational value of the specimen must warrant its collection. Only very small amounts of such specimens just sufficient for the intended use should be collected by only one or two individuals. It is not necessary nor acceptable practice for all members of the group to collect samples. The field trip is intended as an investigation of nature, not a souvenir hunt.

PROGRAM PLANNING

A feature of all the units of the Natural History Section of the Nassau County Museum is the land surrounding them devoted to the preservation of the natural environment. Each tract exemplifies one or more land features typical of Long Island. All preserves have great potential as sites for Outdoor Education using the multi-disciplinary inquiry approach to learning. However, the three hundred and fifty acre preserve at the Muttontown Nature Center is recommended as the most appropriate site for this purpose. The Museum sells, at modest cost, leaflets describing each of its preserves. These leaflets are invaluable when planning outdoor programs at Museum facilities.

It is our philosophy that Outdoor Education is most effective when the outdoor experience is an integral part of the classroom curriculum and the teacher is an active participant in the planning and implementation of the program. To facilitate planning, we offer the services of two of our trained staff -- an educator and a naturalist. These professionals will be available for consultation to help plan curricula and to answer logistical questions. They will provide teacher orientation and inservice training as may be necessary. We strongly urge you to make full use of their services, but major responsibility for the actual planning of the program rests with the teachers. This Museum-school partnership should result in an effective program tailored to the imdividual needs of your students.

At least four to six weeks should be allowed to adequately work out the entire program. The following planning sequence is recommended for developing day-long programs for an entire grade level or school.

Stage I Preliminary Planning Session - Four to six weeks prior to program

This meeting will be held at the preserve and will involve the Museum consultants and the school staff responsible for planning the program. At this time, teaching stations are investigated, ideas are exchanged, and further planning dates scheduled.

Stage II Planning of the Program - the following four to five weeks

After the first session, the actual planning of the program is the responsibility of the school staff. Student involvement may also be desirable. The Museum consultants will be available as needed to help with planning, orientation, and inservice training.

When planning an outdoor education program, it is recommended that teachers keep the following considerations in mind.

Major Purposes and Objectives should be clearly defined and understood so that individual projects may compliment one another. In some cases, it may be desirable to have a major theme running throughout the entire program.

Program Planning (continued)

Number of students is a primary consideration. There should be enough for each student to do in all projects. No one should have to watch for any major part of a project.

Time required for each project. Each project should consist of sufficient activities to fill the allotted time. On the other hand, there should not be so much to do that students are made to feel rushed. The informality of the outdoors as well as the distances separating project sites result in more time required to organize and begin each project. Also, the great variety of stimuli in the outdoor environment tend to shift group interests to unplanned investigations. Time should be allowed for flexibility to take advantage of the unexpected. Finally, preparations and explanations which may be made just as effectively in the classroom should not take up limited outdoor time.

Relation of project to curriculum. All projects should be integral parts of a unit of classroom study. They will have greater impact if they flow directly from class work and students have had adequate preparation. The results of the outdoor experiences will take on new meaning if they become inputs for further class investigation and activity.

Equipment needed to carry out each project will have to be supplied by the school. Projects requiring very technical or cumbersome equipment should be considered for their value from this aspect. However, if the project is worthwhile this should not be a controlling factor. Detailed check lists of required equipment should be prepared and used to insure that all necessary tools are brought to the preserve. Forgotten equipment will handicap or cancel any project.

Stage III Program Orientation Session - One week to two days prior to program

This meeting of all adult participants is held at the preserve. Its purpose is to finalize logistical details and to orient all staff to the program. The activities and projects should be completely planned and scheduled. Staff assignments to activities and responsibilities will be made at this time.

HOW TO PREPARE

WHAT TO WEAR: Obviously, the first consideration in dressing for both the teacher and the students is the weather. Common sense is the guide here. Certain apparel is advisable at all times regardless of the temperature and precipitation.

Boots or at least water proof shoes. There are many low lying areas where it is generally moist if not muddy.
Long pants. Underbrush is sometimes sharp against the legs. Also, poison ivy is abundant and ticks are in season during the warm months.
Long sleeve shirt or blouse. Another precaution against scratches, ticks and poison ivy.
Gloves. Another precaution against poison ivy.

EQUIPMENT: The equipment needed will vary according to the activities planned for the day. All instruments and tools necessary to carry out the day's programs should be provided by the school.

Essential

- Clip boards with a good supply of paper or a field notebook.
- Automatic pencils (pencil lead breaks and pens don't write in all positions).

Desirable

- Plastic or rubberized ground cloth to sit on.
- Field guides to regional trees, shrubs, birds, etc.
- Magnifying lens.
- Plastic bottles and cloth or canvas bags for sample collection.
- Tote bag with shoulder strap or small back pack to carry lunch and supplies.

Optional

- Copy of day's activities and schedule for each student.
- Binoculars.
- Camera

FIRST AID: The teacher-leader should carry a small standard first aid kit in case of minor injury in the field.

LUNCHES: Bag lunches are recommended and may be eaten at the Nature Center or in the field. There are no facilities for buying or serving food or beverages. Special advanced permission and arrangements must be made for preparing food over an outdoor fire. Teachers are responsible for seeing that their students do not litter and clean up after meals.

PARKING: The Muttontown Nature Center has enough space to park two or three buses. Larger capacity parking facilities are available at other Museum installations.

A SAMPLE PROGRAM

A program which includes several days at the preserve will allow sufficient time to exploit the potential of the preserve as well as provide continuity in curriculum articulation. Each day will involve students in a variety of experiences in several types of outdoor environments. An attempt will be made each day to help children experience the outdoors cognitively and effectively. Therefore, a balance between scientific inquiry, the humanities and recreational activities will be sought.

Transportation distances between school and preserve will determine the time available for outdoor educational activities. Three one hour activity periods per day with a lunch period for rest and recreation will usually be possible. An approximate time schedule might be as follows:

9:30	- 9:50	Arrival and orientation
10:00	- 11:00	Period I
11:10	- 12:10	Period II
12:10	- 12:50	Lunch and Relaxation
1:00	- 2:00	Period III
2:10	- 2:30	Embarkation and Departure

Projects will be scheduled in each period so as to provide different types of experiences. Also, projects will be clustered according to areas in the preserve to keep each class sufficiently separated; to provide minimum walking distances; and to give children exposure to different types of areas. Different classes will follow different schedules each day on a rotating basis until each class has followed each schedule.

A complete program of outdoor education at Muttontown Preserve for four classes of fifth or sixth graders might be as follows:

Schedule A - "Pond Study" - Area A; "Insect Study" - Area C; Creative Writing - Nature Center.

Schedule B - "Field Succession" - Area C; "Coniferous Woods Ecology" - Area D; "Songs of Primitive Man" - Area F.

Schedule C - "Soil Ecology" - Area F; "Tree Identification" - Area G; "Nature Poetry" - Area D.

Schedule D - "Deciduous Woods Ecology" - Area G; "Mapping & Surveying" - Area F; "Art in Nature" - Area E.

Lunch time activities might include:

Nature Charades - Nature Twenty Questions - Story Time - Camp Song Fest
Listen for, and identify nature sounds, etc.

ample Program (continued)

Special activities that could be scheduled instead of those selected
rementioned might include:

Conservation Projects - Contour Mapping - Winter Activities -
Identify, gather & prepare edible wild plants - Homesteading new land.

ef descriptions of many of these activities will be found in the following sections.

RESOURCES AND REFERENCES

AGENCIES

Division of Conservation Education, New York State Conservation Department 50 Wolf Road, Albany, New York 12201

Environmental Science Center, 5400 Glenwood Avenue, Golden Valley, Minn. 55422

Forest Service, U.S. Department of Agriculture, Washington, D.C. 20250

National Audubon Society, 1130 Fifth Avenue, New York, N.Y. 10028

Orange County Marine Science Floating Laboratory, Orange County Superintendent of Schools Office, Orange County, California

Outdoor Education Advisory Committee, San Diego City Schools, San Diego, Cal.

Project R.A.C.E., 113 West Liberty Street, Rome, New York 13440

Sierra Club, Mills Tower, San Francisco, California 94104

Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. 20250

The University of Michigan Press, Ann Arbor, Michigan

The University of the State of New York, The State Education Department, Bureau of Elementary Education, Albany, New York 12224

Wilderness Society, 729 15th Street N.W., Washington, D.C. 20005

BOOKS, CURRICULA, AND ACTIVITY GUIDES

Classroom Out-of-Doors, Schramm, Wilbur, (Sequoia Press, Kalamazoo, Michigan)

Curriculum Enrichment Outdoors, Hug and Hug, (Harper & Row, New York)

Environmental Education Instructional Activities K-6 & 7-12, The University of the State of New York, The State Education Department, Albany, New York

Field Book of Nature Activities and Conservation, Hillcourt, William, (G. P. Putman's Sons, New York)

Integrating Conservation and Outdoor Education into the Curriculum, Stapp, William (Burgess Publishing, Minneapolis)

Man in His Environment: A Unit on Conservation for Grade Six, Herchold, (San Diego City Schools, San Diego, California)

Manual of Outdoor Conservation Education, (National Audubon Society, New York)

Outdoor Educati ' 'arles L., (J. Lowell Pratt & Co., New York)

Outdoor Edu & Readings, Hammerman & Hammerman (Burgess Publishing,

Outdoor Education: A Guide to the Instructional Program at the Sixth Grade School Camps, (San Diego City Schools, San Diego, Cal)

Outdoor Education: The Great Outdoors, The University of the State of New York, The State Education Department, Albany, New York

Outlines of Environmental Education, Dembar Educational Research Services Box 1148, Madison Wisconsin.

People and Their Environment: Teachers' Curriculum Guide to Conservation Education, South Carolina Conservation Curriculum Improvement Project, (J. G. Ferguson Publishing Co., Chicago) series of eight

Teaching in the Outdoors, Hammerman & Hammerman, (Burgess Publishing, Minneapolis)

Teacher's Guide to Outdoor Education Grade VI, (San Diego City Schools, San Diego, California)

Tips and Tricks in Outdoor Education, (Interstate, Danville, Illinois)

Workshops in Environmental Education, Proceedings of the Natural Science Center Conference of 1969, Natural Science for Youth Foundation, Philadelphia Pennsylvania

NATURAL SCIENCE BOOKS AND GUIDES

Golden Nature Guide Series, (Golden Press, New York)

Zim Nature Series, (Golden Press, New York)

FIELD SPECIMEN REPORT

STUDENT_____ DATE_____

SEASON_____

Plant or Animal (species if available)_____

Ecological Data

Location_____

Type of Habitat_____

Weather_____

Time of Day_____

Possible Host or Prey (if animal)_____

Animals Found on it (if plants)_____

Growing in Association with_____

Description

Size: Height_____ Width_____ Length_____

Estimate of Maturity (circle one) young, middle age, old

Color_____

Outer Covering (circle one) hard, soft

Other Observations_____

_____

_____

Health (circle one) healthy, injured

If injured, how_____

Special Adaptations_____

_____

_____

SAMPLE ACTIVITY #1

FIELD SUCCESSION

PURPOSE

To investigate a field in succession using a method that makes the investigation more manageable while still netting significant results.

MAJOR CONCEPTS/UNDERSTANDINGS

(1) Existing plant communities are gradually replaced by new communities of higher orders culminating in a climax forest.

(2) Data must be taken uniformly and comprehensively if it is to be valuable.

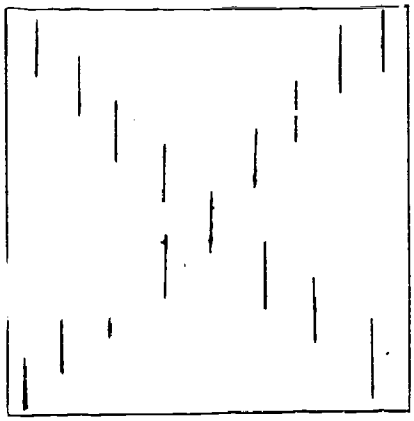
DESCRIPTION OF PROJECT

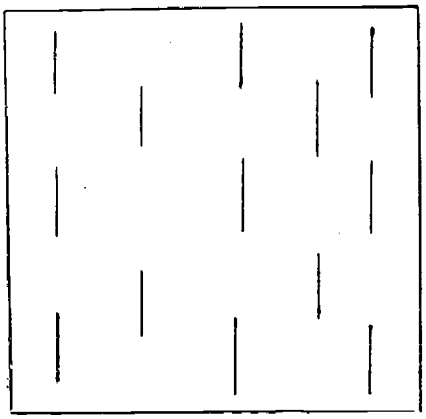
Fallow fields illustrate plant succession. The first plant type grouping to set in on the bare earth are the lichens and mosses; then come the annuals; next, the perennials; and finally, trees and shrubs. All four play an important role in field succession.

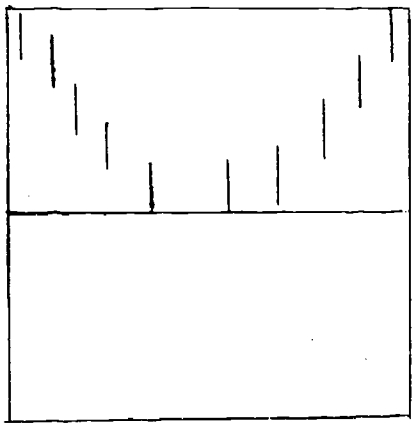
One way to investigate the field is to survey the plant life along a system of lines called transects. Each transect, of uniform length, is divided into equal segments called intervals. Each plant type grouping in an interval is studied in four separate ways. The frequency of a plant type is expressed by the total number of intervals in which it occurs. The abundance is the number of times the plant type occurs within the interval. An arbitrary rating system may facilitate surveying. Cover is estimated by using the size of the shadow cast by the plant if the sun were directly overhead. This should be a percentage figure. Density of the plant type is determined as being continuous (touching - c), intermittant (not touching-i), or, scattered (singly or in patches - p). When the results are considered, a picture of the plant type in relation to the environment becomes evident.

Decide upon a system of transects that will adequately investigate the entire field or one half the field. The number of transects is dependent upon the number of students involved. Two, perhaps three, students per transect is advisable. Each transect is marked by string between stakes, aligned by the use of a compass. An arbitrary number of inches, approximately two to six, should be allowed on either side of the line, making the transect a strip rather than a line. A reasonable unit for the intervals might be six inches or a foot if the transect is ten feet long. Each interval is surveyed as a separate unit for the frequency, abundance, cover, and density of the four different plant type groupings -- lichens and mosses, annuals, perennials, and trees and shrubs. The findings should be charted on work sheets. These work sheets or data sheets should then be compiled and the outcomes discussed.

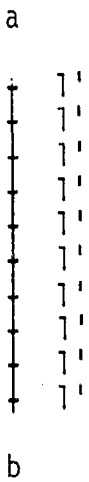
Suggested approaches to taking transects of a field





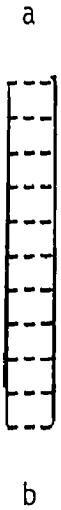


Staking out the Transect Line 10 feet long
drive a stake a point a and b extend string
between two stakes



Intervals are 1 foot long,
2 to 6 inches wide.
Intervals should be labelle
from 1 to 10.

or one could use two sets of string and stakes and form a band or strip
drive two stakes at point a and b about 2" to 6" apart
extend a string between both sets



Intervals are 1 foot long, 2 to 6 inches wide.
Intervals should be labelled from 1 to 10.

SAMPLE ACTIVITY #2

POND STUDY

PURPOSE

To investigate the relationships in a fresh water pond community.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) Specific vegetation zones may be identified from the forest edge to the pond center as: forest zone; shrub zone; emergent plant zone; floating plant zone; and, submerged plant zone.

(2) There are three habitats in a pond environment: the pond surface; the swimming habitat; the bottom.

(3) Different life forms are adapted to living in these different habitats.

DESCRIPTION OF PROJECT

At the pond site, pairs of students should work independently to observe, measure and record the following types of data about the physical characteristics of the pond within the limits of their tools and instruments: depths at various distances from shore; diameter and/or circumference of pond; temperature at various depths and distances from the shore; turbidity of water; oxygen content of water; and light penetration at various depths. They should also determine the following types of biological data: vegetation zones present; plants and animals in each zone present; special adaptations observed in plants and animals found; and, food sources.

Students should be urged to devise ways of obtaining data and specimens without wading into the pond so as not to unduly disturb its ecology. Living things should be observed and studied at the site and returned unharmed to the pond. Small samples of water may be taken for later microscopic study of plants and animals in the laboratory. In this case, ONLY ONE TEAM should be assigned to collect and label small bottles or test tubes of water at various depths. A few drops of water from each sample per microscope is sufficient for laboratory study. This laboratory study can most conveniently be done in the classroom, but some schools may wish to bring microscopes to the preserve for use in the Nature Center.

SAMPLE ACTIVITY #3

SOIL ECOLOGY

PURPOSE

To identify and examine the horizons of a soil profile and to investigate the relationship of a soil community.

MAJOR CONCEPTS & UNDERSTANDING

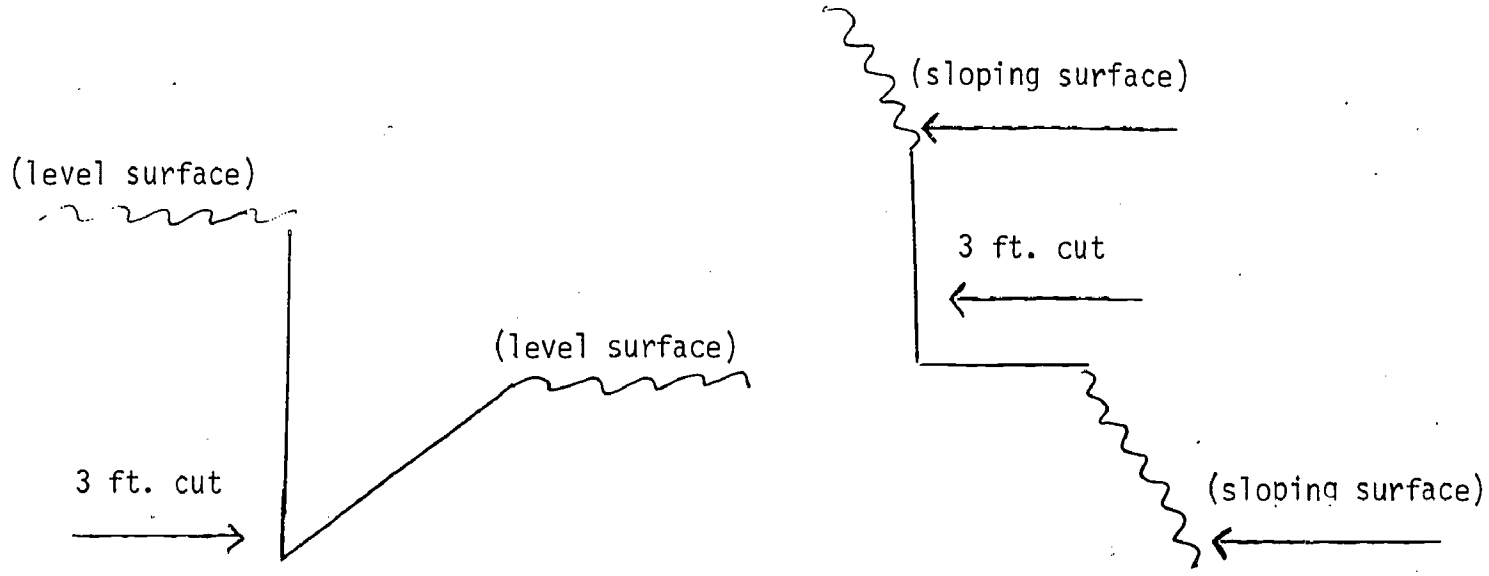
(1) The soil lying in place in an area may be divided into zones or horizons of varying thickness and composition.

(2) The physical characteristics of soil determine, in large part, the particular plant and animal inhabitants.

(3) The plant and animal inhabitants form a web of interdependency.

DESCRIPTION OF PROJECT

With a coring tool, take a core sample one to three feet deep or, in the absence of a coring tool, make a three foot vertical cut in the soil with a shovel as in one of the following diagrams:



Sample Activity #3 (continued)

Soil Ecology

Identify the soil horizons as follows:

"A" Horizon - top soil

Litter - leaves, sticks, dead animals, logs, etc., lying on the surface.
Duff - below litter - material shows signs of decomposition.
Leaf Mold - advanced decomposition.
Humus - fine particles of dark organic material completely decomposed.

"B" Horizon - mineral soil

Compounds formed by decay in the "A" horizon are dissolved by water and seep downward (leech) into the "B" horizons.

"C" Horizon - Rock or mineral formations

This could have been the original rock or mineral material or could have been deposited by air, water, gravity, wind or glaciers.

For each horizon and sublayer, record the following data as far as possible with the tools and instruments available:

> Thickness, temperature, moisture, content, PH, particle, size, composition, evidences of plant and animal life, plants encountered, animals encountered.

When the project is complete, fill in the cut and firmly pack it. The class might wish to take small coring samples from various other areas to compare as a follow-up.

SAMPLE ACTIVITY #4

TREE IDENTIFICATION

PURPOSE

To learn to use a leaf key to identify some common trees.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) Living things are classified upon the basis of their characteristics.

(2) By carefully observing specific features of a tree, it is possible to determine a unique set of characteristics which identify the tree.

DESCRIPTION OF PROJECT

A typical key works on a series of questions or statements about a tree. By affirming or rejecting several statements, on the basis of observation, one is led through progressively more exclusive groupings, until reaching the species' name. There are many simple and servicable keys readily available. The teacher should select one appropriate to the region and distribute sufficient copies to her class. A check list type worksheet may be desirable as an aid to order students' observations especially where copies or keys are limited. By affirming statements on the check list, the student compiles a list of characteristics for the plant he is trying to identify. The completed list is then checked against a key or field guide for species recognition.

The teacher should familiarize students with the key and check list prior to arrival. Special terms should be defined and explained. The process by which the keys are used should be explained and practiced by the classroom by grouping and classifying sets of simple objects on the basis of physical characteristics.

At the preserve, pairs of students should work independently to find and identify five or more different trees using a check list of leaf characteristics.

CHECKLIST OF TREE LEAF CHARACTERISTICS

Describe the

Smell_____

Color_____

Are the leaves -

I. Needles?_____

Are the needles -

a) in bundles?_____ How many to a bundle?_____
b) flat?_____
c) four sided?_____
d) scale like?_____

II. Broad leaves?

Are the leaves -

A. Opposite on the stem?_____

Are they -

1) simple?_____
2) compound?_____ How many leaflets?_____

a) pinnate?_____ once?_____
b) palmate?_____ twice?_____

B. Alternate on the stem?_____

Are they -

1) Simple?_____
2) Compound?_____ How many leaflets?_____

a) pinnate?_____ once?_____
b) palmate?_____ twice?_____

What is the size of the leaf?_____

Is the leaf - Entire?_____ Toothed?_____ Lobed?_____

Give the number of buds in one place._____

Give the number of scales on a bud._____

What type of fruit does this tree have?_____

SAMPLE ACTIVITY #5

FOREST ECOLOGY

PURPOSE

To investigate a forest community using the quadrat method.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) There are three main habitats in a forest environment - the canopy, the understory, and the ground.

(2) Different life forms are adapted to living in these different habitats.

DESCRIPTION OF PROJECT

A study of the forest community can be made best using the quadrat method. Three or more squares are set off, ten feet to a side, and staked out. String is tied to the stakes to make an outline of each square.

The class is divided into two large groups; plant and animal. The large groups are further divided into three smaller groups - canopy, understory, and ground.

Each of the six groups record the numbers and kinds of plants (or animals*) in their sector of each quadrat. If the plant and animal life may be identified, the study will be optimum. However, it is not necessary to be able to identify species. The class can agree to designate different species as type A, type B, etc. Other observations such as temperatures light intensity, moisture, and sounds may also be recorded if desired. The class might try to look for and determine relationships between life forms observed.

Finally, averages may be determined across the several quadrats as a measure of the frequencies of species for the forest as a whole. This data might be used to make a graph of frequencies of each species. If similar data is collected in a different type of forest, comparisons can be made.

*Animals can be detected using the five senses. They can either be seen themselves or evidences of animal life such as nests, holes, droppings, prints, and sounds, can be studied.

SAMPLE ACTIVITY #6

INSECT STUDIES

PURPOSE

To study a living insect population in its natural habitat.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) A true insect is a "bug" with six legs and three body parts. (Head, thorax, and abdomen.)

(2) Insect behavior can be studied best when the insects are allowed to live in their natural environment.

DESCRIPTION OF PROJECT

A walk anywhere will provide the student with insects to be studied. They can be found in all seasons depending on the species. Insects include flies, ants, grasshoppers, butterflies, bees and beetles so the choice of study is a large one. All that is necessary is patience and a sharp eye.

Optimum results on the insect study will be obtained by dividing the class into small groups. Projects that can be included are:

(1) Insect galls - have the class find and open an insect gall. Look for the insect larvae or live insects.

(2) Quadrat method - mark off 1' squares on the ground. Look on the surface of the quadrat or dig to a depth of about 6" looking for larvae, eggs, nests and tunnels.

(3) Find an ant hill or insect nest. See if there are any special behavioral traits of specific members of the population.

(4) Catch an insect. Try to distinguish its body parts. Compare the anatomy of different insects.

*For the classroom, living communities or collections can be made.

SAMPLE ACTIVITY #7

MAPPING AND SURVEYING

PURPOSE

To survey and map a field using the method of trilateration.

MAJOR CONCEPTS & UNDERSTANDINGS

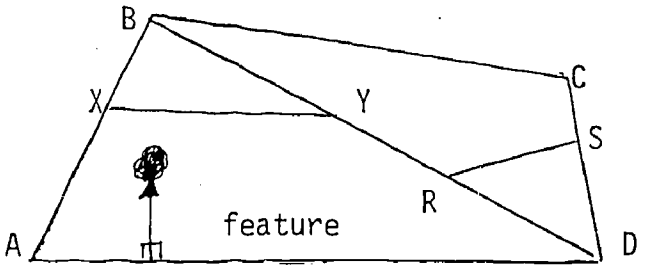
(1) A map of a land surface may be drawn by constructing similar triangles corresponding to triangular areas on the land surface.

(2) The shortest distance between an object and a survey line is a straight line perpendicular from a point on the survey line.

(3) Distances on a land surface may be measured by pacing and converting number of paces to feet.

DESCRIPTION OF PROJECT

Look over the field to be mapped and select points to be the vertices of a quadrilateral. Try to select at least one permanent land feature such as a tree or rock from which direction can be established. Place stakes with flags in the ground at each vertex so that one can be seen from the other. Make a rough sketch of the quadrilateral.



Divide the class into teams of two or three students. One team should be assigned to survey each of the lines AB, AD, BD, BC, CD, and the two "proof" lines XY and RS. Each team should measure the assigned line by pacing; pick out land marks along the way; and record all data in a field note book. At least, one team should determine the direction of the map by locating magnetic north with a directional compass and staking out a north pointing line with arrow on the ground.

After the survey data has been collected, each team must compute the number of feet from the number of paces. Have the students suggest an appropriate scale for their map and have each team compute the length of the assigned line on the map in inches. Finally the students should construct the lines on the map using the principles for constructing similar triangles. The map is accurate if the proof lines turn out to be the number of inches specified by the teams which surveyed them. Important land features can be plotted on the map.

SAMPLE ACTIVITY #8

HOMESTEADING NEW LAND

PURPOSE

To understand the problems of early settlers by simulating a problem they faced.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) A homestead or settlement should be planned for convenience, function and esthetics.

(2) A homestead or settlement should be compatible with natural features and conditions so as not to unduly disturb the ecology of the area.

DESCRIPTION OF PROJECT

The class may find it easier to conduct this activity subsequent to a mapping project in the same area.

The kind of living area to be laid out is determined by the topic of study in the social studies curriculum. It could be a French farmhouse, pilgrim settlement, modern housing development, or a homestead during the westward expansion period. The class might imagine they are one or more families moving west. First, the class plans the type and number of buildings and facilities comprising the homestead or settlement. The class is divided so that there is one team per building or facility.

Survey the teaching area and decide where each building and facility is to be situated. All environmental factors must be considered. Place a flag and a north pointing arrow at the approximate center of each building. Stake out the buildings by pacing and measuring in a clockwise direction. After the outside walls have been outlined, additional walls, fences and other features may be outlined.

The class should evaluate the finished project in terms of convenience, function, and esthetics as a living site. Also, the impact of such a homestead or settlement upon the ecology of the area should be projected.

SAMPLE ACTIVITY #9

ART IN NATURE

PURPOSE

To give students an opportunity to express their thoughts and feelings about the natural world through artistic means.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) Artistic creations carry a meaning from the artist to the viewer.

(2) Each aspect of an artistic work adds or detracts from the desired meaning. These important aspects include: positioning, shading, size, color and texture.

DESCRIPTION OF PROJECT

This lesson is designed to make the student his own artist. All the work should be done entirely on his own within the necessary guidelines. These guidelines include: 1) the objective of the work must be oriented to nature; 2) proper treatment of the grounds must be kept in mind. (No cutting of live plants.)

T he student is given a choice of media in which to work. For instance, pencil sketches, water colors, collages of natural material, photography and others might be included. The student should be encouraged to express himself in a medium of his own choosing, but keep in mind the materials and procedures necessary.

Upon arriving at the teaching area, allow the students to look around quietly. They must make a final decision concerning the media with which to work. This decision should rest upon their reaction to the area.

Allow the students to position themselves. Let them spread out. The returns will be more varied and original. Once everyone is settled. Let them try to solve their own problems.

SAMPLE ACTIVITY #10

NATURE POETRY

PURPOSE

To experience the natural world through the eyes of a poet.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) Poetry is a literary form which may be used to express ones feelings.

(2) The natural world may evoke a variety of feelings.

DESCRIPTION OF PROJECT

The class members should seat themselves comfortably in a quiet outdoor area (i.e. on a lawn; by a pond or brook; on a hill; in a woodlot). Ask the students to sit very quietly and look, listen and feel. Through questioning, encourage the children to identify and describe their sensations and their feelings toward these sensations.

Read a short poem or excerpt you have previously selected which describes a natural phenomenon present in the area. Ask the children to focus their senses upon the real objects or sensations described as they listen. Discuss their reactions to the poem and to the real objects or sensations. Repeat this activity with another poem or excerpt.

Ask the children to express short phase "word-pictures" of things they observe or sense in the area. Can some of these be put together in poetic format? Read another selection to illustrate. Have the children try writing short poems about something in the area using one of the poetic forms studied in class.

SAMPLE ACTIVITY #11

SONGS OF PRIMITIVE PEOPLE

PURPOSE

To understand primitive cultures through their literature (poems/songs) and to feel a kinship with the "family of Man" and with nature.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) All people, regardless of their technological advancement or the complexity of their cultures, share the need for love, laughter, tears. understanding .... self expression and praise ....

(2) Poems (songs) of primitive people are their literature in which they express their feelings and emotions.

DESCRIPTION OF PROJECT

This lesson can probably be given in any natural setting, but a stand of trees or an open meadow far from obvious evidences of civilization would be most effective. Have the students sit comfortably on the ground in a circle.

To set the mood, have the children close their eyes, breath deeply and imagine: "This (outside) is our home. All animals are our brothers. We are a hunting people. We hunt animals and gather wild plants for food. The weather and the forest affect our lives every day. At night the darkness covers us. The sun warms us at noon. There are many things we do not understand in nature."

Quietly recite a primitive "Song" selected previously which expresses the mood you wish to create. Encourage children to react and express their feelings. Continue with another selection.

A good source of songs from primitive cultures is Out of the Earth I Sing compiled by Richard Lewis. Material is available from many other sources as well; see Ethnomusicology, Folklore, and Mythology selections.

The poems may vary in length. Some are best adapted for singing, while others are good for acting out. The poems can be read aloud by the teacher or read or chanted by the students. The students might make up music for some. In any event, students should be encouraged to express the mood and their feelings by chanting, singing and acting.

SAMPLE ACTIVITY #12

CREATIVE WRITING

PURPOSE

To write tales explaining the "how and why" of some natural phenomenon or describing something observed in nature.

MAJOR CONCEPTS & UNDERSTANDINGS

(1) Many stories, legends, or tales which are a part of a people's folklore have developed from curiosity about an unknown or misunderstood phenomenon.

(2) These stories represent a "way of knowing" which is considerably different from our scientific method.

DESCRIPTION OF PROJECT

On the way to the teaching area, encourage the students to keep a sharp eye and carefully observe things they encounter. Upon arrival at a field, grassy area, or woods, allow the children to seat themselves comfortably. Discuss some of the things the children observed on the way or in the area. Encourage them to select something that interests or fascinates them in nature. What questions arise in their minds? Have them consider some explanations. Perhaps, they might imagine themselves as the object. What might they then do, feel, say, etc.?

Have the children write short stories or fables about their musings. Some examples might be:

- Why pine trees don't lose their leaves in winter
- Why trees grow up instead of down
- Why birds fly
- How the squirrel got his tail
- How mushrooms came to be
- How the cardinal came to be so red
- Imagine you are an animal (insect) being observed by (kept as a pet by) a human
- Write about the "War of the Ants"

WINTER ACTIVITIES

Outdoor Education need not be limited to the warm weather months. Investigating the snow-covered environment can be as productive as investigation of the spring flowers. A number of winter activities in different disciplines are suggested here; these may be modified to meet specific class needs:

(1) Snow Sculpture

(2) Make snow shoes -- either outside in previous session or, in classroom. Snow-shoeing

   a) a first-hand experience in learning about the sport.
   b) history of snow-shoeing.

(3) Search and identification of animal tracks in snow.

(4) Write stories (or make up stories) about tracks --- be a detective; i.e., "What happened here...."

(5) Problem -- How much snow does it take to equal one inch of rainfall?

(6) Investigating winter environment(s)

   a) Air temperature
   b) Soil temperature -- under varying depths of snow cover
   c) Surface temperature
   d) Wind direction
   e) Wind velocity
   f) Humidity
   g) Light intensity

(7) Preserving snow crystal shapes

Using a clear lacquer spray (i.e., Krylon) and clean glass slides, one can preserve snow crystal shapes. All materials should be kept cold (at outside temperature). Spray slides with thin coat of lacquer; allow snowflakes to fall on them and let dry one hour. These can then be examined with hand lens or microscope.

CONSERVATION PROJECTS

These projects are limited and vary depending on the time of year. There will be times when there won't be any projects available.

If a group is interested in doing a Conservation Project, it is recommended that they check into it at the time they are planning their program.

In most cases, they will have to furnish their own equipment, as the Museum does not have enough to go around. Some special equipment for special projects may be available.

Some projects that may be available at certain times of the year are:

(1) Cutting vines from trees

(2) Cleaning ponds and streams

(3) Transplanting trees and shrubs

(4) General cleanup

(5) Erecting bird feeders and houses (these would be built at home or school; also, maintaining them)

(6) Thinning some woodlots for improvement

(7) Building brushpiles