

Nature Study: A Practical Science Course for the Non-science Major

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IU East is a small regional campus of the Indiana University system located in Richmond, Indiana. Enrollment is about 1400 students. Most degrees granted on this campus are at the associate level. Students pursuing baccalaureate degrees do so through Indiana University System schools or through transfer to other IU campuses or other institutions. As in most universities, students at IU East, regardless of major, must fulfill distribution requirements which include some hours in the field of science.

On a campus with limited number of faculty and course offerings, providing science courses appropriate for the non-science major can be a problem. A first-level course designed as groundwork for majors in a particular discipline, may not satisfy the long-term goal of scientific literacy for a student in a non-science area. For several years we have offered at IU East a course for non-science majors titled Natural History (Plant Sciences B214). Feeling further description necessary, it is listed in the schedule of classes with the explanation, "a course in nature study". The 3 credit hour course may be used to fulfill science requirements in most IU East programs, but does not count toward a Biology major in the IU system.

Natural History attracts students from many major areas. Bachelor of General Studies students usually make up the greatest number, with Business, English, Criminal Justice, Education, and Human Services well represented.

The course is offered each summer for one six-week session, usually from early July to mid-August. It meets two mornings a week from 8:15 to 11:40. This time is sufficient to allow travel off-campus for field trips, and is early enough to avoid the heat and possible thunderstorms of a later summer day. All class sessions involve outdoor activities; some days we are not indoors at all.

The scope of a course titled Natural History might include many topics. Instead of focusing on content in a particular area, emphasis is placed on techniques of nature study. Since I am a biologist, I then use living things as a vehicle for teaching how to study in the out-of-doors. In this way students come from the course, not with a volume of facts which may be soon forgotten, but with tools which can be used to increase their enjoyment of the world around them. The texts for the course are *Insects*, and *Pond Life* (Golden Nature Guides) (2,4).

Typical enrollment is 20 to 24 students. Handling this many people in an activity-based course is a problem. The nature hike approach simply does not work. A major challenge in planning has been to devise activities which can be done by small groups with little or no guidance. I make extensive use of a series of Discovery Worksheets which were originally developed for Indianapolis Public Schools and their Bradford Woods outdoor program (1). These materials provide many activities geared for individuals or small groups. It is not always possible to work in small groups. In moving to a study area we often go as an entire class. It is interesting how these mass walks change as the course progresses. At the beginning they go quickly, with quite a bit of chatter among students; at the end it is difficult to move a group along on schedule because individuals are so often stopping to investigate things, not only asking me questions, but sharing with classmates. After completing activities in a study area discovery sheets are used on an individual basis as we return to classroom or cars. Drawing with natural materials, sketching, listening—quiet, reflective exercises are used at these times.

Early emphasis is on sharpening senses and improving observation skills. One favorite tool for focusing observations is the cinquain—a simple written form which forces the author to become involved with his subject (Figure 1). We write several cinquains during the summer. Closer observation using dissecting microscopes is always a treat. Students are admitted to a world they have never seen before as they focus downward through a clump of moss or into a flower.

CINQUAIN: WORKSHEET

1 word

2 descriptive words

3 action words

4 words tell how one feels about it

sum up with a word related to the first
or related to the whole study

FIGURE 1. The Cinquain.

Values are an important part of the course. Because for some students the out-of-doors is unfamiliar, there are usually some negative feelings—especially about such things as snakes, slugs, and spiders. As we learn about these things, attitudes mellow. “YUCK” is not allowed. I use another writing exercise, the diamond, to direct students to see positive and negative aspects of a subject (Figure 2). After the first “yuck” of the session, this form is taught, and subsequent “yuckers” are assigned a diamond to appear on the board before the next class. I have had some students actually do library research to find out positive information about their topics (mosquitoes, in particular).

Woven into the outdoor structure of the course is a study of plants and animals, their characteristics, needs, roles in nature and some classification (Figure 3). For example, as part of plant study I introduce keys by using the key from *Fifty Trees of Indiana* (31). First, branches are brought into the classroom for practice, then students working in small groups, key additional trees found on the IU East campus. We capture insects and other arthropods and discuss features which characterize major insect orders and

RAIN
WET DRIPPING
HELPS CROPS GROW
A BLESSING / A NIGHTMARE
MUDDY RAIN PUDDLES
CAUSES DAMAGE
FLOODS

FIGURE 2. The Diamond.

which separate insects from their relatives. Each outdoor experience integrates subject matter and techniques.

Many activities are done without leaving campus. At least once during the summer, each student is required to provide something for "show and tell". Often this allows us to discuss things which students have questions about and find interesting which were not necessarily on the schedule or found during our outdoor class sessions. The IU East campus provides a good outdoor laboratory. There are two wooded nature trails with intermittent streams, and a parcourse trail which goes through meadow and scrubby areas. Late in the course students are asked to bring children to class with them. We usually have about 30-40 children in attendance. Working in pairs, the nature study students guide small groups of children through discovery activities on the IU East campus. Guiding another person's discoveries involves a different perspective for the students. Though many are apprehensive about the day, at its completion most agree it was a valuable experience.

July 8	Getting into nature, describing, using senses	(IUE)
July 10	Plants and their role, trees, using keys	(IUE)
July 15	Higher plants-some important groups, looking closer	(IUE)
July 17	Lower plant classification, plant reproduction	(Sedgwick's Rock)
July 22	<i>Quiz</i> ; Animal classification-invertebrates, insects	(IUE)
July 24	The pond community	(Hayes Arboretum)
July 29	Birds, mammals, interdependence	(IUE)
July 31	<i>Quiz</i> ; Discovery in an urban setting	(Joseph Moore Museum, Promenade)
Aug 5	Geologic history	(Whitewater Gorge area)
Aug 7	Discovery through children's eyes	(IUE)
Aug 12	Canoe trip	(Brookville, IN)
Aug 14	Final activity (quiz)- <i>YOU</i> teach the course	

FIGURE 3. Schedule of Activities from Course Syllabus.

Field trips off campus are restricted to the local area since student cars must be used for transportation. We go first to Sedgwick's Rock Nature Preserve where we wade up a creek to an area where we study lower plants. A trip to Hayes Arboretum provides 2 ponds in which to dip our nets to study ecological relationships within a community. This is followed by a comparison to meadow and forest communities explored on our campus. At the Joseph Moore Museum on the Earlham College campus we study animals not encountered in the field. This trip prompts discussion of nature study in an urban situation, and is followed by a discovery session on Richmond's downtown promenade shopping area. The last activity of the summer (and most popular) is a morning of canoeing on the Whitewater River. We rent canoes and spend about 4 hours on the river with stops along the way for discussion, food, and rest.

Attendance and participation are primary factors in evaluating student performance in the course. In addition three quizzes are given which cover classroom presentations, as well as questions requiring some thought about experiences on field trips—"What was your favorite thing about. . . ? What specific ways did you use each of your five senses on the . . . trip"? For the final quiz, students are taken to a new area and each pair given 50 feet of twine. They are instructed to lay out a nature trail in a designated area and conduct an 8-station nature hike for their classmates.

Formal evaluation of the course is done on the day of the final quiz. A form is used which asks student reaction to specific activities during the summer, both on and off campus. This has been a most useful tool in planning. The most satisfying form of evaluation, though, is an observation of behavior change as the summer progresses and student reactions during the course. There are a few comments which are consistently made from year to year: ". . . made learning fun". "In all my time outdoors, I never really saw things before; now I point things out to others". "I'll never look at my surroundings quite the same again". If a goal of education is to bring about a behavior change in the learner, then Natural History (B214) at Indiana University East is real education.

Literature Cited

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