

**SEE**  
**System for Ecological Education**

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*Abstract*

The System for Ecological Education (SEE) is a new systematic approach to life-centered environmental education which employs a scope and sequence format. It includes grade level teaching materials for K-6, and for grades 7-12 a scheme of eight topics of concern which can be integrated into existing curriculums.

SEE provides a unifying framework within which the environmental input of all educators may become cumulative. It is ecologically comprehensive and forms the basis for college level teacher training. It establishes for K-12 educators minimum ecological understandings for each year of study. It suggests a route to take to bring about these understandings; yet it allows full latitude for the teacher to exercise initiative and imagination.

Because SEE is a system, it requires teacher direction to assure a smooth flow, and this direction may be used to make sure that the child becomes a participant in the educational experience. Students are expected to learn by doing. The laboratory for learning is their own local surrounds.

**Scope and Sequence—Grades 1-6**

The scope and sequence charts, one for each grade, are based on environmental concepts developed by Roth (2); the U. S. Department of Agriculture, Forest Service (3); and the Indiana Department of Public Instruction (1). There has been substantial grouping of material for simplification, and most concepts are presented in language appropriate to the grade level in which they are used. The concepts selected for each grade are those which are comprehensible and which contribute to the progressive grade by grade development of the horizontal thought threads. The six threads are: 1) *Living Things*, 2) *Needs of Living Things*, 3) *Meeting Needs and Wants*, 4) *Problems from Meeting Needs and Wants*, 5) *Solving Problems*, and 6) *Man's Moral Responsibility*. It is important to understand that in these threads the material becomes increasingly more complex in each successive grade. Across the time span of the child's education, each thread remains intact; and at the completion of high school, building is still taking place on the understandings introduced in kindergarten or in one of the lower grades.

## K-12 Grade and Subject Area Teaching Materials

### Kindergarten

The system presents 25 pages of material which is divided into three subject areas: 1) *Using the Senses*; 2) *Introducing the Physical Environment—Air, Soil, Water, and Sun*; and 3) *Living Things*. Included in each area are experiments, outdoor activities, games, and a bibliography guiding the teacher to books, films, filmstrips, pictures, charts, and other visual aids.

### Grades 1-6

Individual grade level charts have been developed. These expand the concepts found on the scope and sequence charts for each grade. The expansion sometimes involves more than one sub-concept. It employs the same horizontal threads used in the scope and sequence chart. Grade level charts are made up of one vertical column for the concept or sub-concept and six vertical columns with the following headings: 1) *Introducing the Concept*; 2) *Developing the Concept*; 3) *Films, Filmstrips, & Slides*; 4) *Other Visuals*; 5) *Publications*; and 6) *Other Resources & Suggestions*.

In many columns of their grade charts, teachers will be guided by an asterisk (\*) to refer to a separate guide book. In it they will find suggested activities to help develop the concept or written material to further their own understanding of the concept.

### Grades 7-12

The concepts for these grades are presented in four vertical columns 1) *Title*; 2) *The Natural Laws (Governing Factors)*; 3) *Man Apart from Nature (Problems Created)*; and 4) *Man a Part of Nature (Solving Problems)*.

Each of eight topics is treated in every vertical column. The study of the first topic, *How Many People are Enough?*, for example, involves consideration of three things in the column entitled *The Natural Laws*: 1) Population change is the product of biotic potential and environmental resistance. 2) Living things increase in number to the level the environment will permit. Man's ability to modify the environment does not make him an exception. 3) The Earth's carrying capacity is finite for one and all species.

In the column *Man Apart from Nature*, students consider the need for restrictive laws and regulations which arises as the population increases. They also find proof that as numbers of people increase, the need for food, fiber, and minerals (energy in particular) expands.

In the column *Man a Part of Nature*, they give careful study to man's obligation to function rationally in a system with his culture and the biophysical environment.

There are seven other subjects covered by this same horizontal approach: 1) *Consuming the Fruits of Technology*; 2) *For a Beautiful World*; 3) *Preserving Man as a Sensitive Creature*; 4)

*Man Needs Wilderness*; 5) *Man and Adaptation*; 6) *Conserving our Natural Resources*; and 7) *Man and the Environment*.

### Examples of Horizontal Developmental Threads

The K-12 study of living things is an example of the systematic development of a child's understanding of increasingly complex material by building each year on the base erected the previous year. This study is initiated in kindergarten as the children use their five senses to learn about life around them. In succeeding years, they discover how living things differ and how they are alike. They explore the world of living things and learn that there are also similarities and differences in the ways living things acquire the things they need and want. Continuing to build their understanding, they use similarities and differences in form and function to divide plants and animals into groupings. Before completion of grade six, they learn to construct and use various kinds of taxonomic keys. The depth of understanding they achieve either as individuals or as a class depends on their interest and ability. The study of living things continues thru the upper five grades. Each of the eight topics which are integrated into the existing curriculums in these grades is concerned with one or more aspects of living things. The K-6 foundation studies of living things are prerequisite to a full understanding of the eight topics.

Another example which demonstrates both the systematic development of a concept thread and student involvement also starts with the study of living things in kindergarten. However, this thread branches in grade one from the route taken in the previous example to become resource rather than biologically oriented. The children develop in class their ideas of the difference between needs and wants. In subsequent grades, they find out how the natural resources of planet Earth are used to satisfy our needs and wants. They then seek local evidence of problems which can be traced to the fact that each year we are using resources to meet extensive and growing demands of more and more people. The students appraise the influence of advertising, particularly the creation of desire for more wants, and the resultant increase in resource consumption. A field trip to the local solid waste disposal facility focuses on the serious problem of disposal of the child's own throwaways. This "needs and wants" thread continues into the eight topic areas and broadens the base from which they are studied.

Throughout the whole system, man's moral responsibility to Earth and all its living things is stressed. The child is guided to explore ways his own behavior influences the quality of his environment. He forms his own ideas of what behavioral patterns are required of individuals and both small and large groups if there is to be a quality life for all living things.

The System for Ecological Education is designed to be an educational tool with which to shape attitudes and values and to construct patterns of behavior which will make each citizen an environmental asset.

**Literature Cited**

1. MICHAUD, HOWARD (Chairman, Cons. Education Advisory Committee). 1959. Teaching Conservation in Indiana Schools. Indiana Dep. Public Instr. Bull. 232, Indianapolis, Ind. 50 p.
2. ROTH, ROBERT E., M. O. PELLA, and C. A. SCHOENFELD. 1970. Environmental Management Concepts—A List. Univ. Wis. Tech. Rep. 126, Madison, Wis. 72 p.
3. U. S. Dep. Agr., Forest Serv. 1968. Conservation Tools for Educators. Pacific Northwest Region Publ. Portland, Oregon. 76 p.