CALIFORNIA STATE UNIVERSITY, NORTH RIDGE

ENVIRONMENTAL EDUCATION

RESOURCE UNIT DEVELOPMENT

A graduate project submitted in partial satisfaction of the requirements for the degree of Master of Arts in Education

Elementary Curriculum Specialization

by

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The graduate project of Thomas Arthur Lankford is approved.

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ABSTRACT

ENVIRONMENTAL EDUCATION
RESOURCE UNIT DEVELOPMENT

by
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Master of Arts in Education
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The purpose of this project was to review the related literature on Environmental Education and then develop a teacher resource unit for 5th and 6th Grades based on the recommendations of the literature. From the review of the literature, Environmental Education is defined, its effect on the Elementary School Curriculum detailed, its historical development discussed and the components of Environmental Education programs are reviewed.

It was found that Environmental Education can be defined as the process of educating citizens to know about the environment and its problems, to be able to participate in helping solve the problems, and being motivated to do so. There is much interest in Environmental Education
today, but there is little effect on the Elementary School Curriculum because few programs have been developed due to lack of interest and funding.

The teacher resource unit on EE is based on the professional literature. The three conceptual areas of natural environment, human environment, and environmental problems were the basis of activities. The processes of inquiry, valuing and decision making are stressed as well as affective outcomes.

It is recommended that more funding be made available for Environmental Education research and development. The teacher resource unit needs a formal evaluation to examine the strengths and weaknesses. A possible expansion of the unit into a comprehensive K-12 Environmental Education Program would also be very beneficial.
CHAPTER I
Introduction

Statement of the Problem

Although Environmental Education has received much attention in the past five years, with pollution and the environmental crisis, it is still not being widely taught in the Elementary School. This problem is compounded by the many differing approaches and materials being offered to the teacher by educational institutions and commercial concerns in all areas of the curriculum.

As a Fifth and Sixth Grade teacher I feel that the concepts, skills and values of Environmental Education are a very necessary and important part of the Elementary School Curriculum. The problem concerning Environmental Education in the Elementary School is what to teach and how to teach it.

Purpose of the Project

The purpose of this project is to review the professional literature on Environmental Education and then to develop a teacher resource unit on the subject for use in my Fifth and Sixth Grade classrooms.
Importance of the Study

This study is important for me to gain an understanding of Environmental Education and to develop a resource unit based on the professional literature. Too often Elementary School teachers are forced to use inadequate curricula that are not based on sound educational research. If more teachers could help develop curricula for their school programs, there would be a greater understanding of the purposes and goals of the curriculum and a correspondingly improved teacher and student performance. Because the resource unit in this project is based on the literature and has been used in the classroom by the developer, it has greater potential for success.

Background of the Study

This project is not only a culmination of my Masters Program work, but also a reflection of the interest in improving the curriculum in my classroom and my deep concern about the environmental degradation of our planet.

Organization of the Remainder of the Project

A review of the related literature on Environmental Education is contained in Chapter II, followed by Chapter III with its development of the teacher resource unit. The summary, conclusions and recommendations are in Chapter IV. References and Appendix conclude this project.
CHAPTER II
Review of Related Literature

Definition of Environmental Education

In the past five years Environmental Education (also denoted as EE) has developed from its infancy as an offshoot of Conservation and Outdoor Education into a legitimate curricular concern of Elementary School program developers.

Although there have been many definitions of Environmental Education postulated, most closely resemble the definition of Swan (1969):

Environmental education may be conceived as being directed toward developing a citizenry that is knowledgeable about its environment and its associated problems, aware of the opportunities for citizen participation in environmental problem solving, and motivated to take part in such problem solving. It might be said that environmental education is concerned with developing informed attitudes of concern for environmental quality. (p. 28)

The areas of knowledge, problem solving and motivation as the basis of EE is also mentioned by Stapp (1972). The definition of EE according to the Environmental Education Act of 1970 is more detailed.

Environmental Education is the integrated process which deals with man's interrelationship with his natural and man-made surroundings, including the relation of population
growth, pollution, resource allocation and depletion, conservation, technology, and urban and rural planning to the total human environment. Environmental Education is the study of the factors influencing ecosystems, mental and physical growth, living and working conditions, decaying cities, and population pressures. Environmental Education is intended to promote among citizens the awareness and understanding of the environment, our relationship to it, and the concern and responsible action necessary to assure our survival and to improve the quality of life. (Office of Education, 1970, p. 9)

Both definitions stress education that promotes citizen awareness and action towards solving environmental problems. Because so many groups with differing goals and philosophies have been interested in Environmental Education, many have claimed that it lacks a clear definition. (Alvarez, 1972) However, almost all groups point out the need for a curriculum of Environmental Education that includes the cognitive area of environmental knowledge, especially the science of Ecology. Also, the area of man's relation to the environment and the area of serious pollution problems should be studied. In order to know how to solve environmental problems, the process-skill area of inquiry is needed, including its extension involving decision making actions on the part of the learner. The affective areas of valuing and value-clarification are necessary to motivate the learner to use his cognitive knowledge through decision making skills to help solve environmental problems. Because the study of the environment and its problems involves so many
separate disciplines EE should be interdisciplinary or multidisciplinary (Helgeson and others, 1972), including special emphasis on the natural sciences, the social sciences and the humanities. How Environmental Education evolved into its present status is discussed in the next section.

**Historical Development of Environmental Education**

Both the positive and negative aspects of EE can be better understood by studying its development through time. Although the term "Environmental Education" was suggested just six years ago (Covert, 1969, p. 11), it has its roots in three areas: Conservation Education; Outdoor Education; and the "Ecology Movement." The development of Conservation Education will be discussed first.

**Conservation Education.** Involving the study of wise use of natural resources, Conservation Education has been part of the curriculum for the past fifty years. In a paper presented at the National Conference of the Conservation Education Association (August, 1970), Conservation Education was defined as the study of man's intelligent use of his natural environment through the development, management, preservation, and renewal of natural resources for material, cultural and aesthetic needs to benefit the present and future generations. This study of the natural environment and its conservation has become one of the
The following eight paragraphs are based on numerous accounts of the history of Conservation and especially "The Heritage of Environmentalism," by Stuhr (1973).

The history of Conservation and Conservation Education began before the Revolutionary War. Although there were laws against burning forests and restrictions on harvesting fish in the 1650's, the early view was of inexhaustable resources. Other laws to protect deer and songbirds were all but impossible to enforce. In 1681 William Penn decreed that one acre of forest be set aside for every five acres cleared, but this too was largely ignored. Soil conservation was a concern of Thomas Jefferson, who advocated crop rotation, fertilizers, deep plowing and contour plowing.

In the early 1800's Conservation was still not practiced. Although both Alexander Wilson and John James Audubon sought protection of some birds that faced extinction, the Lewis and Clark Expedition fueled the belief of the people at that time that resources were so abundant as to be considered inexhaustable. The ethic of "utilization, exploitation and possible extermination" was followed. During the same time that the nation's resources were being plundered, the philosophies of Emerson and Thoreau, such as the man-nature relationship and the appreciation of the beauty of nature, were being
proclaimed, The philosophy held that progress was made by achieving a harmonious relationship with nature, rather than from more efficient exploitation of nature's beauty and wealth. The philosophy was reflected in 1832 when George Catlin, a frontier artist, suggested creation of National Parks to preserve the beauty of the West. It was not until 1872 that the first National Park, Yellowstone, was established.

In the late 1800's two groups were emerging under the banner of Conservation. One group stressed esthetic ethical values, including wilderness preservation espoused by John Muir and his Sierra Club. The other group, led by Gifford Pinchot, proved to be more dominant. It was concerned about the wise use of natural resources for public economic interests. Most policy from 1890-1930 was based on this later group, including laws enacted for conservation of resources and protection of wildlife.

Aldo Leopold's work in the 1930's became the basis for the modern "Ecology Movement." His "land ethic" states that the fallacy of Conservation lies in the attempt to justify solely on economic grounds what is really a philosophic concept. Leopold felt that until the land was loved and thus respected, there was no chance for it to survive. The "land ethic" changes the role of man from conqueror of the land to a plain member and citizen of it. Leopold tried to change Conservation from an emphasis on man's
well being to the rights of other forms of life and the environment to a healthy existence. Scientific facts were the basis of Leopold's work.

Today, Conservation Education is still mainly concerned with transferring the concepts of Conservation to students in hopes of encouraging wise utilization of natural resources. Conservation Education has basically a rural agricultural orientation because its concepts are most readily applicable there. For this lack of relevancy to urban life, very little Conservation Education is included in the curriculum of urban areas.

Many aspects of Conservation Education and the newer Environmental Education have been successfully taught outdoors. The subject of Outdoor Education (also denoted as OE) is discussed next.

Outdoor Education. OE developed around the philosophy of a method of teaching students in an outdoor setting. This includes anything concerning the outdoors from nature study to hunting. It has been defined as a method of teaching wherein established disciplines, topics and understandings which can best be taught outdoors are taught outdoors. (National Conference of the Conservation Education Association, 1970)

Outdoor Education went through three periods of development. From 1930-1939 the public schools, seeking to expand objectives to educate the "whole child",
Outdoor Education has become standardized and well entrenched in many school systems. Changing from extracurricular summertime activities to on-going instructional school programs, Outdoor Education has changed its focus from camp living to subject matter from the school curriculum, including Conservation and more recently Environmental Education. (Hammerman, 1973, pp. 55-56)

The "Ecology Movement." The third and most important cornerstone of EE was the great recognition and concern about pollution and the degradation of our environment. This "Ecology Movement" was based on the obvious smog and water pollution problems as well as the pesticide issue brought to public attention in Rachel Carson's Silent Spring. Stewart Udall evoked public concern on other environmental problems in Quiet Crisis. The resulting ferment of "Ecology" effected all aspects of society, from government and industry to the individual citizen.

One public outcry was for the educational system to do something about the environmental problems facing the nation. Swan (1969, p. 26) stated that creating a concern for environmental quality should be a function of the schools and that education is the key to survival, not new laws and regulations. In our free society it is the citizens who must bear the ultimate responsibility for
choices and actions. Education is the way to equip citizens with the knowledge to understand the environmental problems. (Allen, 1970)

The result of education's interest in environmental quality was a variety of individual efforts by various groups, but especially by those involved in Conservation and Outdoor Education. Articles concerning these two areas predominate the literature related to EE from 1950-1972. (Roth and Helgeson, 1972) Conservation and Outdoor Education groups had some criticism leveled at them because their goals did not match the problems of the environment, especially in urban areas. Conservation stressing wise use and development of natural resources and Outdoor Education with its variety of camping and sporting concerns did not relate directly to the urban blight of air pollution, decaying cities and other environmental problems. To solve this discrepancy, Covert (1969, p. 11) suggested changing Conservation Education to an Environmental Education which would stress the problems of the urban citizen and his environment. He stated that EE should be an integrated, interdisciplin ary and modular curriculum to primarily meet the needs of urban children and adults. Schoenfeld (1970) further elaborated on the evolution of Conservation Education into Environmental Education:
In terms of its scope, the new environmentalism attempts to be all-encompassing. Whereas yesterday we tended to treat soil conservation, water conservation, forest conservation, wildlife conservation, and so on as separate units, today we try to understand and explain the ecological unity of all man-land relationships. In terms of its focus, then, the new environmentalism is man-centered. (pp. 5-6)

The primary concern has shifted from survival of endangered species to the actual survival of the human race. There is not as much concern about quantities of natural resources as with the quality of human experience.

The "band-wagon" effect of the new environmentalism drew in educators from all areas of the curriculum. Science was the first area of development since many programs already contained the study of Ecology. A prime example of this is the Science Curriculum Improvement Study's development of Life Science Units for K-6. Of the three federally funded Science Programs at the elementary level, SCIS is the most promising for EE because it centers on ecological and biological questions. (Fishleder, 1972)

The Social Studies have also been a very important area for EE development. The study of environmental problems at areas on or near the school site makes Social Studies a very relevant experience for Elementary School students. (Swan, 1969, p. 27) It has been advocated (Aims, 1970) that new kinds of learning experiences involve students in critical analysis of the social values
and interactions that underlie environmental degradation. Some educators even feel that the study of the total environment, as developed in EE, can serve as the conceptual basis of the Social Studies. For example, Todd (1970) holds the view that today's Social Studies are not really "social" and they should embrace the domain of EE:

They have unwittingly reflected the prevailing arrogance that the earth is man's to do with as he wills and that all other manifestations of life can be brushed aside or ruthlessly exterminated on the ground that man is sufficient. Well, he isn't sufficient, as we are now learning to our dismay. The plants and animals can get along on this planet quite well without us, but we can't get along without them. The social studies will be worthy of the name only when they deal with the human species in relation to the whole of life.

The whole of life. The unity of all things. This is the conceptual rock upon which we must begin to rebuild our education program. (p. 758)

Wagar (1970) states that another crucial task of the Social Studies is to provide everyone with a deep ecological awareness of environmental problems. It is the Social Studies with their conceptual basis in the social sciences that ideally serve as the way to study man's effect on the environment.

Not only natural science and social science, but also the humanities are an important component of man's understanding of himself and his place in the environment. (Arnsdorft, 1972) The vital importance of the humanities to EE is stated by Stillman (1972):
Environment, as a matter of educational concern, is at least as much a problem of morals and ethics, of politics and of administration as it is of understanding with the aid of natural science. Further, the underlying force which inspires interest in the subject of environment . . . is a matter of feelings, emotions, and esthetic appreciation, and thus properly in the domain of the humanities. (p. 200)

The belief that only man's engineering and technological skills are necessary to find solutions to environmental problems is not well founded. Insights derived from the social sciences, the arts and the humanities need to be utilized to successfully cope with problems of the environment. (Severino, 1970)

Although there was much discussion about EE, the passage of the Environmental Education Act of 1970 and the resulting establishment of the Office of Environmental Education, under the U.S. Office of Education, provided the largest impetus for actual curriculum development and implementation. The Act made possible grants to state departments of education, local school districts, organizations and institutions to support research, demonstrations, and conduct pilot projects to educate the public. (Steidle, 1971) Of the numerous EE projects that were developed, the common characteristics of what were considered to be good EE programs as rated by the U.S. Office of Education were multidisciplinary approach, focus on contemporary problems, incorporation of nonformal and formal educational processes and utilization of
resources outside of class, attitudes as well as information stressed, and all age groups included in participant-centered designs. (Helgeson, 1972, p. 1) All programs were somewhat deficient because of the lack of adequate research in EE to base the programs on. Only a few minor research papers were encountered in the review of literature related to EE. Most papers discussed either educator's opinions or descriptions of programs. This reflects the newness of the field of EE and the real need for proper research and development of EE programs. Too many other educational endeavors become superficial "fads" because they are not based on sound research. Hopefully the development of EE will not fall into this category.

Effect of EE on the Elementary School Curriculum

Although much work has been devoted to EE in the past seven years and much progress has been made, there is an insignificant effect in the majority of Elementary Schools.

Hepburn and Keach (1974) found little effect of environmentalism on Social Studies in the Elementary School for three major reasons: the teacher does not know how to teach EE; the skill areas of reading and math are stressed; and there is no good framework with cognitive goals available to most teachers. A 1970 questionnaire on EE sent to all 50 state departments of
education yielded 36 replies. Of those, only 11 states had requirements for teaching EE. (Budde, 1970) In a survey of California EE programs only 38% of the school districts replied. Of those, none claimed a comprehensive EE program. (Blade, 1971)

EE programs are reaching only a relatively small proportion of students. Blade (1971) stated:

Although education in wise use of natural resources and the protection of the environment is becoming more widespread, only a minority of students in California are being reached. A much smaller percentage receive a thorough and comprehensive training program. (p. 97)

This reflects the feelings of Cummings (1974) that although EE has attained a level of respectability, there is still loose organization and little sense of direction. Many guidelines are published but many are contradictory.

EE will be a part of the curriculum as long as there are environmental problems. However, if EE is going to be effective in helping to alleviate the problems the world is facing, it must overcome some almost insurmountable obstacles. As with any good program, before teaching the children, the educational institution must feel the need to develop and implement EE programs based on extensive research and development. This would include training for teachers and materials for the classroom. The sad fact in education is that unless there is large monetary support for a program, it is almost impossible for the program
to have a wide use and influence on children's learnings and attitudes. Blade (1971) concludes:

Environmental Education in California is conducted on a hit-or-miss basis. If a teacher or administrator in the school, school district or county office happens to be very interested and knowledgeable in environmental problems, then the chances are good that an environmental education program will be developed, if any funding is available. These two conditions, interested and knowledgeable instructors, and funding, make thorough and effective environmental education programs a rarity. (p. 97)

Perhaps our worsening environmental problems will eventually bring more funding to solve this dilemma. At present, the most a teacher has is a few supplementary texts on Ecology and his or her own ingenuity to develop classroom activities on EE, if the teacher is even motivated to do so.

Another serious problem is basing EE on sound research, because there is very little in the literature. Doran and others (1974) found that a massive number of articles and publications have been written about environmental problems, but most are reports of isolated attempts at EE or are ideas based on individual's opinions. Research needs to be done to verify these opinions.

The area of values poses another set of problems. Many educators are concerned with giving children the opportunity to change their attitudes toward the environment through valuing and value-clarification techniques.
However, this important part of EE is just beginning to be developed. Examples include Pilburn (1974) who has designed a series of moral dilemmas based on EE using the Kohlberg stages of moral reasoning, and LaHart and Tillis (1974) who have used wildlife as a way to teach environmental values. Instruments for measuring the expected attitudinal changes in EE are just emerging. DeLucia and Parker (1974) recently developed and tested a valid instrument for measuring environmental attitude change. Hopefully this very important step in EE will be more fully developed and put into use in the future.

Components of the Environmental Education Curriculum

Both the cognitive and affective components of EE and the best methodology for teaching EE can be categorized into five areas: content; inquiry; valuing; decision making; and affective outcomes.

Content. The content of an EE program must provide knowledge about the total environment and the role of man in it. (Bennett, 1974) This causes a problem for program developers because the environment is all encompassing while most curricula are not. For this reason many, such as Altman (1972), have suggested EE should be interdisciplinary. If EE used a separate-subject approach, a very fragmented pattern of information would be given to the learner, with few clues to what is most significant.
(Sale and Lee, 1972) This shows the need of an interdisciplinary approach for EE. Science and Social Studies should be stressed because they are the most predominant of the disciplines involved with EE. (Arnsdorf, 1972)

Because EE cuts across many disciplines three areas of study have developed:

1. The natural cycles and interrelationships which form the basis of the science of Ecology.

2. The student's perceptions of and relations with surroundings in which they and other persons function.

3. The impact that man in everyday functioning has had and can have on the natural cycles which sustain life on this planet.

(Instructional Objectives Exchange, p. 1)

Although understanding the natural and man-made environment is important, this content must be fused with the processes of inquiry, valuing, decision making and affective outcomes.

Inquiry. Both Aims (1970) and Bennett (1974) state that inquiry skills are an important part of EE in developing the student's critical thinking needed for decision making. Inquiry has been defined as a strategy of teaching in which a problem is noted and defined, then a scientific model of search is constructed by the learner. The progressive steps of procedure are: gathering appropriate data, formulating probable answers or hypotheses, testing the hypotheses, verifying the knowledge,
and relating the findings into a concept or generalization. This may lead to the need of further inquiry. The skills of critical and reflective thinking about social problems will help children to participate as responsible citizens in their communities and societies. (Howarth, 1971)

This participation by citizens is one of the major goals of EE.

The three modes of inquiry are the analytic mode, the integrative mode and the policy mode. Using the analytic mode, the learner takes apart a concept, making specific observations and classifying this by definition. The relationships are then stated as generalizations. The learner uses the integrative mode to put together, or integrate, relationships between parts and wholes. The policy mode is used by the learner to direct the integrative and analytic processes towards making decisions or judgments. The policy mode corresponds with decision making except for not including actual performance of the decision.

The processes of inquiry relative to the three modes are observation, classification, definition, contrastive analysis and comparison, generalization and holistic integration, inference and communication. (Shirley, 1973)

Although the previous discussion relates mostly to Social Studies, inquiry is based on scientific method. In Elementary Science Programs, Rowe (1973) states that
students need to learn how to ask questions of themselves so they can improve the quality of their own inquiry. To improve students' inquiry behavior the teacher should ask fewer questions in a given period, give more time for thought, and teach students to ask questions.

Knowledge of environmental problems is only the first step in helping to find solutions. The critical thinking skills of inquiry must serve as an important and necessary tool of the learner in EE if he or she is to provide answers for the multitude of environmental problems.

Valuing. It is clear that the area of values is involved with EE. One of the major objectives of EE is to develop attitudes of concern for the biophysical environment that will motivate citizens to participate in biophysical environmental problem solving. (Stapp, 1970) The problem is how to develop this environmental concern that will be so strong as to motivate people into action.

Two different groups were found that deal with values education. One is based on the seven sub-processes of valuing by Louis Raths:

- **Prizing** one's beliefs and behaviors
  1. prizing and cherishing
  2. publicly affirming, when appropriate

- **Choosing** one's beliefs and behaviors
  3. choosing from alternatives
4. choosing after consideration of consequences
5. choosing freely

Acting on one's beliefs

6. acting

7. acting with a pattern, consistency and repetition (Raths, Harmin and Simon, 1966)

The values-clarification approach does not aim to instill any set of values. The goal of the approach is to help students utilize the seven processes of valuing in their own lives and to apply the valuing processes to already formed beliefs and patterns of behavior. (Simon, Howe and Kirschenbaum, 1972)

In relating values-clarification to Environmental Education, the valuing processes have three steps: students express ideas and feelings about the environment; students' responses are accepted non-judgmentally by the teacher; and students examine their own positions in detail, including the exploration of other aspects of the conflict. (Knapp, 1972)

The second group dealing with values education base their work on Kohlberg's Theory of Moral Development. Galbraith and Jones have outlined his theory:

Level 1: Pre-Conventional

At this level an individual's moral reasoning results from the consequences of actions (punishment, reward, exchange of favors) and the physical power of those in positions
of authority.

Stage 1: Decisions result from a blind obedience to power, an attempt to avoid punishment, or an attempt to seek rewards.

Stage 2: Decisions result from a desire to satisfy one's own needs and occasionally the needs of others. Individuals view reciprocity as a matter of "you scratch my back and I'll scratch yours." Reasoning involves little consideration of loyalty, gratitude, or justice.

Level 2: Conventional

At this level an individual's moral reasoning involves consideration of the interest of others (family and peers) and a desire to maintain, respect, support, and justify the existing social order.

Stage 3: Decisions result from a desire to please and help others and receive their approval in return. Behavior is frequently judged by intention—"he means well" becomes important for the first time.

Stage 4: Decisions result from a desire to maintain the existing authority, rules, and social order. Right behavior consists of doing one's duty.

Level 3: Post-Conventional

At this level an individual's moral reasoning incorporates moral values and principles that have validity and application beyond the authority of groups. Moral reasoning becomes more comprehensive and reflects universal principles.

Stage 5: Decisions result from recognition of an individual's rights within a society that has a social contract. As a result the individual's reasoning emphasizes the "legal point of view".
but with an emphasis upon the possibility of changing laws.

Stage 6: Decisions result from an obligation to universal ethical principles that apply to all mankind. The universal principles of justice, reciprocity and equality of human rights, and respect for the dignity of human beings as individuals serve as a basis for individual reasoning. (Galbraith and Jones, 1975, p. 17)

Kohlberg applies the theory to Elementary School in order to advance the level of the students' moral thinking. For example, dissonance builds in a Stage 1 child who is presented with a dilemma where actions typical of Stage 1 are not adequate to resolve the dilemma. Actions typical of Stage 2 moral thinking may help the child to reduce this inter-conflict. The child, faced with similar moral dilemmas over a period of time, will internalize those actions typical of Stage 2 responses and begin to make moral judgments at that next higher level. (Jantz and Fulda, 1975)

Environmental Education has the proper content for designing a series of moral dilemmas that will advance the students' level of moral reasoning. Intervention designed to raise the level of moral reasoning seems most effective if the student is challenged at one level above that at which he is operating. Effectiveness of intervention diminishes as the gap between the challenge and the student's level of thought widens. There is no way
to effect moral reasoning if a conventional student is challenged with examples of high-level post-conventional reasoning. (Pilburn, 1973)

LaHart and Tillis (1974), and Pilburn (1973) have both developed a series of activities based on the Kohlberg model to help teach environmental values.

Both Raths and Kohlberg's work have been used as a basis for teaching valuing in EE to insure that the student will develop an environmental ethic and will be motivated to act on helping solve environmental problems. There is some discussion on which model of teaching valuing is more beneficial in the classroom, but no definitive conclusions have been made yet.

**Decision Making.** Unifying content, inquiry and the valuing process is decision making. It is the concrete unifying structure of EE. Decision-making models provide a mechanism that integrates experiential learning and inquiry methods into a valuing process leading to an action. (Cummings, 1973)

Decision making consists of six phases.

1. Identification of the problem.
2. Obtaining necessary information.
3. Production of possible solutions.
4. Evaluation of such solutions.
5. Selection of a strategy for performance.
6. Actual performance of an action or actions, and subsequent learning and revision. (Brim and others, 1962, p. 49)

The first five phases are inquiry processes. The important sixth phase takes the critical thinking skills of inquiry to the problem solving stage and beyond. Kaltsounis (1970) clarifies this point.

In essence, decision making is the inquiry method or the problem-solving approach, taken a step beyond simply arriving at conclusions about the status of phenomena or situations. Decision making is more dynamic in nature than problem solving or inquiry in that it requires action as a result of and following each instance of systematic intellectualization. (p. 666)

Another basic aspect of decision making is that it involves the affective domain of the individual, such as feelings, values, attitudes and beliefs.

Action is the culminating point of decision making. It is like the experiment which lends validity to the hypothesis. Actions which yield information tending to confirm the choice of the decision maker reinforces the individual's values which guided the decision. (Cummings, 1974)

The action required by the decision making process can take place as social participation. Nichols (1973) reports on the four levels of social participation proposed by Thomas and Brubaker:

Informative projects are meant to describe conditions in the real world outside the classroom, but are not meant to investigate how these conditions might be changed. Another class of projects can be labeled
as stimulative. In addition to describing conditions, these projects urge the receivers of the information to take some action. If pupils advocate a particular course of action, the project is a directive one. If pupils undertake action on their own, the project becomes an operative one. (p. 12)

Nichols continues by discussing some of the limitations of social participation in the Elementary School.

The resolution of most neighborhood, community, and school issues will generally be beyond the capability of pupils. It is naive to suggest that a class can successfully resolve community issues that are viewed differently by a variety of interest groups. It may also be difficult to bring about minor changes in school procedures within bureaucratic, urban school systems. The learning that occurs during the planning and carrying out of action projects does not depend on the successful resolution of issues. Rather, the learning depends on how well the pupils understand the nature of competing points of view and the ways that people can organize themselves to advance what is in their interest. As mentioned previously, the goal of a social participation approach is to teach children a method of relating to their social environment; namely, by actively trying to improve it in terms of their values. (p. 13)

Obviously social participation is a definite benefit to any EE program because it brings the activities down to a more concrete operational level for the Elementary School child, using his or her own neighborhood environment, although some aspects of the environment are not concrete.

Affective Outcomes. The process-skill areas of values-clarification and moral dilemmas, as well as the area of content, help the student acquire values important as components of Environmental Education and environmental
problem solving. The values to be developed include environmental concern and motivation to help solve the environmental problems.

Summary

Environmental Education is the process of educating citizens to know about the environment and its problems, to be able to participate in helping solve the problems, and being motivated to do so.

The origins of EE come from Conservation Education, the Outdoor Education methodology and the "Ecology Movement."

By 1969 educators began discussing, formulating and developing programs for EE. Although varied and diverse, certain common elements began to emerge in most discussions, including the need for an interdisciplinary approach. Not only Science, but Social Studies, Humanities and the Arts were to be integrated into EE programs.

Although there is much activity in EE today, it has little effect on the elementary school curriculum. Few programs have been developed due to lack of interest and funding. As pointed out by Blade (1971), most teachers do not know how to teach EE and would require intensive teacher-training and a properly developed program complete with materials. The lack of research makes the value of many programs questionable.
Today EE is just emerging from an embryonic state with many faults and shortcomings, but also with many promising developments.

The components of most EE curricula include a content area based on the natural environment, man-made environment and environmental problems. The processes of inquiry and valuing are necessary components of decision making, one of the most important objectives of EE. The affective outcomes are important in providing motivation for the citizen to become concerned and to act on environmental problems.

Environmental Education may go the way of Conservation Education, being taught infrequently in rural areas, or it can serve to give meaning and perspective to the entire education process. (Kormondy, 1971)
CHAPTER III
Development of a Teacher Resource Unit

Purpose of the Unit

The primary purpose of this project was to develop a teacher resource unit on Environmental Education that I could use with the 5th and 6th Grade students at Tropico School, Rosamond, California. Because there is no formal EE Program in the school district I was interested in developing the unit for our school.

The basis of the teaching unit is the review of the literature in Chapter II. The unit is structured on the literature's recommendations.

The unit has been specifically designed for 5th and 6th Graders of the Rosamond area because effective EE programs are designed around the local area of study. This assures a more concrete operational aspect to the learner's activity since he or she is familiar with the area, and the activities are in the student's world instead of a textbook.

The time of instruction for the unit is roughly one hour per day for six to seven weeks.

The effect of EE on students in Rosamond would be enhanced if more time were allocated for its study and a
K-12 Program was developed. Since this unit may be one of the only exposures of students to EE, the unit's content is rather broad in nature, rather than being a limited indepth study, such as found in each level of a comprehensive K-12 program.

Development of the Unit

The teacher resource unit was developed around conceptual, process and affective areas. The conceptual areas are natural environment, human environment, and environmental problems. There are twenty broad objectives in the conceptual area, with twenty corresponding behavioral objectives. The process-skill area contains nineteen objectives under the headings of inquiry, value-clarification, moral dilemmas, decision making and social participation. The justification of including these is extensively discussed in Chapter II of this project on pp. 15-24. The affective objectives consist of four science attitudes and two environmental affective outcomes to be attained. Activities are developed around the broad and behavioral objectives into a coherent teacher resource unit.

Structure of the Unit

The initiating activity is a discovery lesson using crude oil from a Santa Barbara beach.
The discussion that follows the initiating activity leads directly into the first conceptual area of activities, the natural environment. The twelve activities are mostly based on the SCIS Life Science Units Populations and Communities. As stated in Chapter II of this project, SCIS is the best elementary science program suited for EE. The activities have been modified to fit the time limits of this unit. The second conceptual area is human environment. It is composed of ten activities based on exercises from the Instructional Objectives Exchange and my own development of community related activities. In environmental problems, the third conceptual area, I have developed six activities involving pollution in Rosamond.

The culminating activity of designing the "Future City of Rosamond" involves all the previous concepts, processes and attitudes by having the students develop an ecologically and socially acceptable human community. This activity stimulates interest in further study of the environment and its problems.

Throughout the three conceptual activity areas students should develop and use the skills of inquiry, valuing and decision making, as well as exhibit affective growth.

Evaluation of student performance is through completion of behavioral objectives included in conceptual,
process and affective areas of the activities. An evaluation form is kept by the teacher to monitor satisfactory student progress through the activities.

Evaluation of the Teacher Resource Unit

No formal evaluation of the teacher resource unit, such as pre- and posttesting of students, was undertaken due to the limited time and scope of this project. I have taught some of the activities for several years and others have been developed and used in classrooms just this semester. One of the purposes for teaching the activities was to find problem areas and eliminate them from the unit.

The concrete, material-oriented, opened-ended nature of many of the activities seemed to stimulate student growth. Successful student completion of the behavioral objectives should indicate the unit is achieving its EE goals. The unit is meant to be refined and improved with use. As the developer, implementer and teacher of the unit, the process of formative evaluation and revision will be easier and more precise. With continuing use and development of the student evaluation procedures the impact of this EE unit can be more carefully monitored.

One of the major problems of developing and implementing the teacher resource unit was going through all the extraneous material written on EE in order to find
relevant papers. I also gained valuable insights in developing and implementing curricula when another teacher at Tropico School taught the unit. Although enthusiastic, his lack of background in elementary science hindered teaching of the activities. Except for the determined teacher, extensive in-service training seems to be the answer to this problem, but that takes time and money, which almost no one seems to have.

Summary

The teacher resource unit on EE is based on the professional literature. It is specially designed for 5th and 6th Graders living in the community of Rosamond.

The three conceptual areas of natural environment, human environment, and environmental problems were the basis of activities. The processes of inquiry, valuing, and decision making are stressed as well as the affective domain. Broad objectives and behavioral objectives are the foundation of the unit.

No formal evaluation of the unit was done, but successful student performance on behavioral objectives should indicate the unit is serving its purpose in achieving the goals of Environmental Education.
CHAPTER IV
Summary, Conclusions and Recommendations

Summary
The purpose of this project was to review the related literature on Environmental Education and then develop a teacher resource unit based on this.

EE has had many definitions but all generally contain the following three areas that should be developed in citizens: knowledge about the environment and its problems; awareness of when and how to use environmental problem solving; and motivation to take part in such environmental problem solving.

The historical development of EE relates to three areas: Conservation Education; Outdoor Education; and the "Ecology Movement." By 1969 educators began discussing and developing EE programs, based not only on science but also on the social studies and the humanities.

The effect of EE on the Elementary School Curriculum is very limited due to lack of interested curriculum developers and lack of adequate funding for such development. The existing EE programs are reaching only a small proportion of the students in this country, and of those programs many are not sufficient because very little valid research has been conducted upon which to base the
Components of the EE curriculum should have content based on the natural and human environment, and environmental problems. Process areas including inquiry, valuing and decision making as well as affective outcomes should be included.

The teacher resource unit was based on the recommendations of the professional literature including an interdisciplinary approach strongly stressing the process areas of inquiry, valuing and decision making as well as the affective outcomes of motivating the citizen to be concerned and act on problems. The three conceptual areas that were the basis of the activities were the natural environment, the human environment and environmental problems. The Fifth and Sixth Grade students who participated in the activities helped the developer find problem areas in the unit, which were corrected.

Conclusions

Environmental Education is just emerging as a viable curricular area. Since 1969, the program designs have shown considerable improvement. Lack of funding and lack of adequate research have been the primary reasons for ineffectual EE programs in the schools today.

The teacher resource unit for 5th and 6th Grades seemed to be very successful, based on completion of behavioral objectives and teacher observation. No formal
evaluation of the unit was done. The unit used the professional literature as a basis for developing the program instead of the more prevalent method of using a state adopted textbook for the curriculum. The unit used the child's environment as a basis of curricula instead of the textbook author's ideas printed in a book.

Recommendations

It is suggested that the importance of using Environmental Education as a way to solve the environmental problems of the world warrants more funding of research and development of projects concerned with the environment.

It is also suggested that a formal evaluation of the Teacher Resource Unit be done to examine the strengths and weaknesses of the unit. The unit could also be developed into a comprehensive K-12 Environmental Education Program in the Rosamond area school district to insure adequate knowledge of content, acquisition of necessary skills and motivation to solve environmental problems.
REFERENCES


APPENDIX
ENVIRONMENTAL EDUCATION
TEACHER RESOURCE UNIT
Grades 5 and 6

Overview

This unit is based on the professional literature on Environmental Education and the sources of activities are noted if not originated by me. It is designed for teaching in the intermediate grades for six to seven weeks duration.

Although this unit was developed primarily for the students at Tropico School, Rosamond, California, all activities can be modified to fit most intermediate elementary classrooms.

The Broad Objectives are classified into Conceptual (Natural Environment, Human Environment, and Environmental Problems), Process (Inquiry, Valuing, Decision Making), and Affective Outcomes.

The Behavioral Objectives of the Unit are designed to operationalize the Broad Objectives rather than describe what the students will be doing in any one activity.

Evaluation of the objectives is performed by marking an Evaluation Form that lists the students' names and all of the behavioral objectives. A "circle" indicates
a satisfactory completion of the objective, an "X" indicates to check the performance of the student again and a small "dot" indicates that special assistance is needed by the student.

Each conceptual and process outcome is evaluated once in the unit, as specified by the behavioral objectives. The six affective outcomes are to be checked throughout the unit by teacher observation.

Broad Objectives have been coded as follows:
- C-1 through C-20 Conceptual
- P-1 through P-19 Process
- A-1 through A-6 Affective

Each corresponding Behavioral Objective, which operationalizes the Broad Objective, has been coded as follows:
- CBO-1 through CBO-20 Conceptual
- PBO-1 through PBO-19 Process
- ABO-1 through ABO-6 Affective

Evaluation of student performance is not done with each and every activity. It is accomplished by recording completion of Behavioral Objectives during certain specified activities.

Because many of the activities come directly from other sources, only a brief summary has been made of those. Others created by myself have been written in more detail.
BROAD OBJECTIVES
BROAD OBJECTIVES

Part 1 - Conceptual

A. Natural Environment

C-1 Population is a group of organisms of the same kind living and reproducing in a particular area.

C-2 Community is a group of plants and animals that live in the same area and are dependent on one another for food and other requirements.

C-3 Raw materials are the chemicals that are incorporated into the food produced by green plants.

C-4 Producers are the green plants in a community that produce the food that supports all the organisms that live in the community.

C-5 Consumers are the group of animals in a community that eat plants or other animals.

C-6 Decomposers are the group of organisms in a community that cause decomposition of organic matter.

C-7 Food chain is a diagram depicting the food relations among plants, plant eaters and animal eaters.

C-8 Food web is two or more connected food chains.

Note: C-1 through C-8 based on definitions from SCIS.

B. Human Environment

C-9 Environment is the combination of all external factors that affect and influence growth, development, and reproduction of organisms.

C-10 Transportation is a means of conveyance or travel from one place to another of passengers or goods.
C-11 The biological needs of man include all those things that sustain his physical well being, such as water, food, air and warmth.

C-12 The social needs of man include all those things that man needs for the individual and the total community to function successfully.

C-13 A human community is a body of people having common political, social, and economic interests.

Note: C-9 through C-13 based on definitions from Instructional Objectives Exchange.

C. Environmental Problems

C-14 Air Pollution is a fouling of clean air with contaminants that are dangerous to man and other organisms.

C-15 A renewable resource is one that can be renewed by a natural process in a short period of time while a non-renewable resource is one that cannot be replaced.

C-16 Conservation is the careful preservation and protection of a resource.

C-17 Solid Waste Pollution is the build-up of large amounts of paper and other types of trash.

C-18 Noise Pollution is an intensity of sound that is dangerous to the human ear.

C-19 Recycling of Materials is the reuse of materials that have already been used.

C-20 Environmentally Sound Community is one in which all pollution problems have been solved.

Note: C-14 through C-20 based on definitions from Instructional Objectives Exchange.
Part 2 - Process

A. Inquiry

P-1 Observation: The perceiving of phenomena in a controlled focused scientific way, always focused on specific items to be observed in relationship to the problem.

P-2 Classification: The ordering of things observed on the basis of common elements or groups of common elements.

P-3 Definition: The labeling of common elements that give unity, categories, or classes of data.

P-4 Contrast Analysis/Comparison: The analysis of different sets of data or behaviors to identify similarities, commonalities and differences. The application of low-level concepts or high-level generalizations to the investigation of new data.

P-5 Generalization: The development of empirically reliable generalizations by developing a hypothesis, testing the hypothesis, posing alternative solutions and stating a conclusion.

Note: P-1 through P-5 based on definitions from Shirley (1973).

B. Value-Clarification

P-6 Expressing ideas and feelings about the environment.

P-7 Non-judgmental responses given.

P-8 Examination of own position in detail, including the exploration of other aspects of the conflict.

Note: P-6 through P-8 based on definitions from Knapp (1972).

C. Moral Dilemmas

P-9 Level of moral reasoning is increased by a challenge at one level above student level.
Note: P-9 based on Kohlberg's Theory of Moral Reasoning.

D. Decision Making

P-10 Identification of the problem.
P-11 Obtaining necessary information.
P-12 Production of possible solutions.
P-13 Evaluation of such solutions.
P-14 Selection of a strategy for performance.
P-15 Actual performance of an action or actions.

Note: P-10 and P-15 based on definitions from Brim and others (1962).

E. Social Participation

P-16 Informative: Projects are meant to describe conditions in the real world.
P-17 Stimulative: Projects urge students to take some action.
P-18 Directive: Students advocate a particular course of action.
P-19 Operative: Pupils take action on their own.

Note: P-16 through P-19 based on definitions from Nichols (1973).
Part 3 - Affective

A-1 Curiosity
A-2 Inventiveness
A-3 Valuing Critical Thinking
A-4 Persistence

Note: A-1 through A-4 based on definitions from SCIS Evaluation Supplement.

A-5 Concern for the Environment
A-6 Motivation to help solve environmental problems.

BEHAVIORAL OBJECTIVES
BEHAVIORAL OBJECTIVES

Part 1 - Conceptual

A. Natural Environment

CBO-1  The student will demonstrate understanding of the concept POPULATION by correctly identifying, grouping and classifying organisms into populations on a drawing.

CBO-2  The student will demonstrate understanding of the concept COMMUNITY by listing organisms in a community and indicating their interdependencies.

CBO-3  The student will demonstrate understanding the concept RAW MATERIALS by writing a paragraph on their relation to the growth of plants.

CBO-4  The student will demonstrate understanding and the concepts PRODUCER and CONSUMER by listing ten producer-consumer dependencies.

CBO-5  The student will demonstrate understanding of the concept DECOMPOSER by explaining in detail what will happen to a dead plant or animal left in moist sand.

CBO-6  The student will demonstrate understanding of the concept FOOD CHAIN by correctly drawing five three member food chains.

CBO-7  The student will demonstrate understanding of the concept FOOD WEB by correctly drawing a food web using desert community organisms.

B. Human Environment

CBO-9  The student will demonstrate understanding of the concept ENVIRONMENT by writing an operational definition of environment.

CBO-10 The student will demonstrate understanding of the concept TRANSPORTATION by listing ten types of transportation and discussing the advantages and disadvantages of each.
CBO-11 The student will demonstrate understanding of the concept of BIOLOGICAL NEEDS OF MAN by writing how the biological needs of man are met in the communities of Rosamond and Lancaster.

CBO-12 The student will demonstrate understanding of the concept of SOCIAL NEEDS OF MAN by writing how the social needs of man are met in the communities of Rosamond and Lancaster.

CBO-13 The student will demonstrate understanding of the concept of HUMAN COMMUNITY by listing ten things that are always found in a human community.

C. Environmental Problems

CBO-14 The student will demonstrate understanding of the concept of AIR POLLUTION by collecting on white tissue paper air pollutants from the exhausts of three different cars and discussing the results.

CBO-15 The student will demonstrate understanding of the difference between the concepts RENEWABLE and NON-RENEWABLE RESOURCE by listing five renewable and five non-renewable resources.

CBO-16 The student will demonstrate understanding of the concept CONSERVATION by drawing a picture illustrating conservation practices in forests.

CBO-17 The student will demonstrate understanding of the concept SOLID WASTE POLLUTION by collecting evidence of solid waste around the school and describing the results to the class.

CBO-18 The student will demonstrate understanding of the concept NOISE POLLUTION by listing five examples of noise pollution they heard on a tape recording of noise pollution.

CBO-19 The student will demonstrate understanding of the concept RECYCLING by orally explaining why it is wise to recycle.
CBO-20 The student will demonstrate understanding of the concept ENVIRONMENTALLY SOUND COMMUNITY by making a scale drawing of their planned community.

Part 2 - Process

A. Inquiry

PBO-1 The student will demonstrate the process of OBSERVATION by correctly identifying the items in the Sense of Touch Activity.

PBO-2 The student will demonstrate the process of CLASSIFICATION by correctly circling pictures of organisms into populations.

PBO-3 The student will demonstrate the process of DEFINITION by labeling a list of organisms as producers and consumers.

PBO-4 The student will demonstrate the process of CONTRAST ANALYSIS/COMPARISON by correctly completing the Trees Activity.

PBO-5 The student will demonstrate the process of GENERALIZATION by developing a list of ten things always found in a human community by testing their hypotheses against actual conditions in Rosamond and Lancaster.

B. Value-Clarification

PBO-6 The student will express his ideas and feelings about the Baker's Dozen Activity as measured by teacher observation.

PBO-7 The student will be given non-judgmental responses during the Baker's Dozen Activity.

PBO-8 The student will examine his or her own positions in detail during the Baker's Dozen Activity as measured by teacher observation.
C. Moral Dilemmas

PBO-9 The student will respond to a moral dilemma about sonic booms by proposing solutions that require moral reasoning at a higher level than that of the student.

D. Decision Making

PBO-10 The student will demonstrate the process of IDENTIFYING THE PROBLEM by identifying orally ten causes of the problem of litter on the school grounds.

PBO-11 The student will demonstrate the process of OBTAINING NECESSARY INFORMATION by obtaining evidence of air pollution by collecting exhaust pollutants from three cars.

PBO-12 The student will demonstrate the process of PRODUCTION OF POSSIBLE SOLUTIONS by drawing three alternates to the smog producing automobile.

PBO-13 The student will demonstrate the process of EVALUATION OF SOLUTIONS by ranking a number of solutions to the litter problem at the school, stating reasons for their ordering.

PBO-14 The student will demonstrate the process of SELECTION OF A STRATEGY FOR PERFORMANCE by selecting a strategy based on his or her evaluation of possible solutions to the problem of recycling aluminum cans and pop-tops.

PBO-15 The student will demonstrate the process of ACTUAL PERFORMANCE OF AN ACTION by collecting and bringing to class pop-tops or aluminum cans for recycling.

E. Social Participation

PBO-16 Informative: The student will demonstrate this process by finding polluted areas in Rosamond and pinpointing the place and type of pollution on a map.
PBO-17 Stimulative: The student will demonstrate this process by riding bicycles as much as possible in an effort to avoid causing air pollution.

PBO-18 Directive: The student will demonstrate this process by visiting every classroom in the school and advocating his or her solution for the school litter problem.

PBO-19 Operative: The student will demonstrate this process by helping to clean up litter in Rosamond and recycle aluminum by collecting pop-tops or aluminum cans.

Part 3 - Affective

ABO-1 The student will demonstrate the attitude of CURIOSITY during activities by using several senses, asking questions and showing interest in outcomes of experiments as measured by teacher observation.

ABO-2 The student will demonstrate the attitude of INVENTIVENESS during activities by using equipment in unusual or constructive ways, suggesting new experiments, and describing novel conclusions from their observations, as measured by teacher observation.

ABO-3 The student will demonstrate the attitude of VALUING CRITICAL THINKING by using evidence to justify conclusions, predicting outcomes of untried experiments, justifying predictions in terms of past experience, changing ideas in response to evidence or logical reasons, pointing out contradictions in reports by their classmates, investigating the effects of selected variables, and by providing explanations for solutions to problems, as measured by teacher observation.

ABO-4 The student will demonstrate the attitude of PERSISTENCE during activities by continuing to investigate after novelty has worn off, repeating and experimenting in spite of apparent failure, and completing activities even though classmates have
finished earlier, as measured by teacher observation.

**ABO-5** The student will demonstrate the attitude of ENVIRONMENTAL CONCERN during activities as expressed through his or her oral and written language, as measured by teacher observation.

**ABO-6** The student will demonstrate the attitude of BEING MOTIVATED TO HELP SOLVE environmental problems throughout the unit by participating willingly in problem solving and decision making, as measured by teacher observation.
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<td>Sonic Booms</td>
<td>9</td>
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<tr>
<td>Pollution in Rosamond</td>
<td>16</td>
</tr>
<tr>
<td>Pop-tops and Aluminum Cans</td>
<td>10-15, 19</td>
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<tr>
<td><strong>Culminating Activity</strong></td>
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<tr>
<td>City of the Future</td>
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</tbody>
</table>
INITIATING ACTIVITY
Initiating Activity

CRUDE OIL

Objectives:  P-1 Inquiry/Observation

Materials:  Paper cups with crude oil from Santa Barbara, photo of oil-covered bird.

Vocabulary:  Crude Oil, Oil Spill, Pollution.

Procedure:

1) Pass out crude oil and let students quietly observe and discuss their observations with fellow students.

2) Ask students to write down their observations about the black material in their cups, including color, odour and texture.

3) Discuss observations and ask what the students think the material is. Answers may include tar or oil.

4) Show picture of oil-covered bird and discuss how it got that way. Introduce the terms CRUDE OIL, OIL SPILL and POLLUTION.

5) Ask students to write down other types of pollution they know about, including sources of the pollution and possible solutions the students know about.

Optional Activity:  Have the students orally tell about pollution they have encountered in their life and how it made them feel.
Learning Activities

Natural Environment

CLASSROOM POPULATIONS

Objectives: C-1 Natural Environment/Population
P-1 Inquiry/Observation
P-2 Inquiry/Classification
P-3 Inquiry/Definition

Materials: Planted terrarium, lizards, horny toads,
mealworms, tadpoles, bean plants, toads,
salamanders, mosquito nymphs, isopods,
snails, Populations Record Sheet and
Populations Bar Graph.

Vocabulary: Population

Procedure: 1) Two weeks before activity plant terrarium with grass and beans. Have students
bring in other organisms and place in
suitable terrariums and aquariums.

2) Have students list on Record Sheet all
the types of plants they see in the
classroom and record how many of each
type.

3) Introduce the term POPULATION as a label
for a group of the same type of organ-
isms in any one area.

4) Ask students what other populations
they could count in the classroom.
They should suggest the other animals.

5) Have students count and record the
organisms they suggested, placing data
on record sheet.

6) Construct a bar graph showing the number
of individuals per category. Discuss
the results.

Optional Activity: Have students repeat procedure in their
homes, then share the results with the rest
of the class orally.
## Learning Activities

### Natural Environment

**POPULATIONS FIELD TRIP**

| Objectives:                          | C-1 Natural Environment/Population  
P-4 Inquiry/Contrast Analysis-Comparison  
P-5 Inquiry/Generalization |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Materials:</strong></td>
<td>String, yardstick, Populations Record Sheet, and Populations Bar Graph.</td>
</tr>
<tr>
<td><strong>Procedure:</strong></td>
<td>1) Take class to open field next to school and section off squares (3 yd. X 3 yd.) with string for each group of students.</td>
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<tr>
<td></td>
<td>2) Have groups record types and numbers of each type of organism.</td>
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<td>3) Return to classroom and discuss findings about populations of organisms in the open field.</td>
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<td>4) Have each group make a bar graph and compare the results of each group. Explain differences through discussion.</td>
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<td></td>
<td>5) Have students suggest generalizations about the term POPULATION by defining it.</td>
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<td><strong>Optional Activities:</strong></td>
<td>Discuss how the data would be different if it was a different season, or at night.</td>
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<td></td>
<td>Have students repeat the procedure near their homes and share the results with the class.</td>
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<tr>
<td>Name, Description or Drawing of Organism</td>
<td>Area Where Organism Is Located</td>
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<tr>
<td>Number of Organisms</td>
<td>Name</td>
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</tr>
</tbody>
</table>

Name of Organism

Area Where Organism Is Located
Learning Activities

Natural Environment

POPULATIONS EVALUATION

Objectives: C-1 and CBO-1 Natural Environment/
Population
P-2 and PBO-2 Inquiry/Classification

Materials: Populations Drawing.

Procedure: Pass out Populations Drawing and direct
students to follow its directions.

Evaluation: Correct Populations Drawing and record
results on Evaluation Form under CBO-1 and PBO-2
Populations Drawing

Name _______________________

Directions: Fill-in the Population Table below using the information in the drawing.

<table>
<thead>
<tr>
<th>Name of Organism</th>
<th>Population of Organism</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
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<tr>
<td>3.</td>
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<td>4.</td>
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<td>6.</td>
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<tr>
<td>7.</td>
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<td>8.</td>
<td></td>
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</tbody>
</table>
Learning Activities

PLANT NEEDS

Objectives: C-3 and CBO-3 Natural Environment/ Raw Materials
P-4 Inquiry/Contrast Analysis/Comparison
P-5 Inquiry/Generalization


Vocabulary: Dependence.

Procedure:
1) Discuss with students what a plant needs to grow. Review seed germination and importance of light.

2) Have students plant seeds in sand and in rich soil.

3) After 3 weeks ask students what is in the rich soil that is not in the sand. Structure discussion around decay of organic material.

4) Have students write a well structured paragraph with conclusive examples on this question: What is the relationship between raw materials and plant growth?

Evaluation: Record results of 4) on Evaluation Form under CBO-3.

Optional Activities:
1) Have interested students read about compost piles and have them construct one either at home or on the school grounds to develop rich soil.

2) Conduct further experiments with different types of soil.
Learning Activities

Natural Environment

PLANTS AS PRODUCERS

Objectives:  C-4 Natural Environment/Producers
             P-4 Inquiry/Contrast Analysis/Comparison
             P-5 Inquiry/Generalization


Procedure:  1) This activity is discussed in detail in SCIS Teacher's Manual Communities, (pp. 44-45).
             2) The activity deals with plants as producers of food.

PLANT CONSUMERS

Objectives:  C-4 Natural Environment/Producers
             C-5 Natural Environment/Consumers
             P-1 Inquiry/Observation
             P-2 Inquiry/Classification
             P-4 Inquiry/Contrast Analysis/Comparison

Materials:   Terraria from Plants as Producers Activity, and crickets.

Procedure:  1) This activity is discussed in detail in SCIS Teacher's Manual Communities, (pp. 52-58).
             2) The activity deals with crickets consuming plants.
Learning Activities

Natural Environment

ANIMAL CONSUMERS

Objectives:  
C-3 Natural Environment/Raw Materials  
C-4 Natural Environment/Producers  
C-5 Natural Environment/Consumers  
P-1 Inquiry/Observation  
P-2 Inquiry/Classification  
P-4 Inquiry/Contrast Analysis/Comparison

Materials: Terraria and crickets from previous activities, isopods, mealworms, and frogs.

Procedure:  
1) This activity is discussed in detail in SCIS Teacher's Manual for Communities, (pp. 59-71).

2) The activity deals with animals consuming other animals and the beginning of the food chain concept.

DECOMPOSERS

Objectives:  
C-6 and CBO-6 Natural Environment/Decomposer.  
P-1 Inquiry/Observation  
P-2 Inquiry/Classification  
P-3 Inquiry/Definition

Materials: Bananas, yeast, dead crickets, and vials.

Procedure:  
1) This activity is discussed in detail in SCIS Teacher's Manual for Communities, (pp. 74-83).

2) The activity deals with decomposition.

3) Have the students answer this question: What will happen to a dead plant or animal left in moist sand?

Evaluation: Record results of 3) on Evaluation Form under CBO-6.
Learning Activities

Natural Environment

FOOD TRANSFER

Objectives: C-2 through C-8 Natural Environment/Communities, Raw Materials, Producers, Consumers, Decomposers, Food Chain, and Food Web.

CBO-4 and CBO-5 Producers and Consumers

P-2 through P-5 Inquiry/Classification, Definition, Contrast Analysis/Comparison, and Generalization.

Materials: Paper and Pencil


Procedure: 1) This activity is discussed in detail in SCIS Teacher’s Manual for Communities, (pp. 94-97).

2) The activity ties together the concepts of the preceding activities into food chains and food webs. Various concepts are given labels.

3) Upon completion of discussion, have students list ten sets of Producer-Consumer dependencies using animals and plants used in the activities or with which the students are familiar.

Evaluation: Record results of 3) on Evaluation Form under CBO-4 and CBO-5.
Learning Activities

Natural Environment

COMMUNITIES FILMSTRIPS

Objectives: C-2 through C-8 Natural Environment/Communities, Raw Materials, Producers, Consumers, Decomposers, Food Chain, and Food Web.

P-4 Inquiry/Contrast Analysis/Comparison
P-5 Inquiry/Generalization

Materials: Filmstrips: Plant Communities, Encyclopedia Britannica Films #10792, and Ecosystems of the Seashore and Forest, F-574.

Procedure:
1) These filmstrips serve to reinforce the Natural Environment concepts.

2) Allow free discussion throughout the viewing to promote contrast, comparison, and generalization of the concepts.

Optional Activity:
Have interested students compare seashore, forest and desert ecosystems by drawing representative food webs from each.
Learning Activities

Natural Environment

COMMUNITIES FIELDTRIP

Objectives: C-1 through C-8 Natural Environment/
Populations, Communities, Raw Materials,
Producers, Consumers, Decomposers, Food
Chain, and Food Web.

Procedure: 1) Take class to open field next to
school for quiet, thoughtful observation
of the natural environment.

2) Encourage students to find examples
that demonstrate the concepts they
have learned.

3) After returning to the classroom, have
students construct a food web for the
open field on the chalk board and
discuss.

Optional Activity: Have interested students observe any open
field over a long period of time, keeping
careful notes on the food web. A written
or oral report on the findings can be
given.
Learning Activities

Natural Environment

COMMUNITIES EVALUATION

Objectives:

C-2 and CBO-2 Natural Environment/Community

C-7 and CBO-7 Natural Environment/Food Chains

C-8 and CBO-8 Natural Environment/Food Webs

P-3 and PBO-3 Inquiry/Definition

P-4 and PBO-4 Inquiry/Contrast Analysis/Comparison

Materials:

Paper, Pencil, Consumers and Producers Exercise, and Trees Exercise (adapted from Evaluation Supplement to SCIS Environments).

Procedure:

1) Ask children to write down five organisms found in a forest. Next to each write down what other organisms and non-living parts of the environment they are dependent on (CBO-2).

2) Have the students draw five three member Food Chains that they are familiar with (CBO-7).

3) Have the students draw a Desert Food Web using at least 15 organisms (CBO-8).

4) Have the students complete the Consumers and Producers Exercise (PBO-3).

5) Have the students complete the Trees Activity (PBO-4).

Evaluation:

Record results on Evaluation Form under CBO-2, 7, and 8, and PBO-3 and 4.
Consumers and Producers

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Name</th>
</tr>
</thead>
</table>

Place a 'C' by those organisms you think are consumers and a 'P' by those you think are producers.

1. Pine Tree
2. Mountain Lion
3. Deer
4. Grass
5. Rabbit
6. Willow
7. Daisies
8. Earthworm
9. Butterfly
10. Bluejay
Study the diagram and then answer the questions.

Annual Temperature Range

Much Rain

Little Rain

' A'

-10 to 40

20 to 70

60 to 95

1. Circle the environmental factor that might have caused the lack of growth of trees in area 'A'.

   water

   temperature

   other

   Explain how this factor might have affected the growth of trees.

2. Circle the environmental factor that might have caused the lack of growth of trees in area 'B'.

   water

   temperature

   other

   Explain how this factor might have affected the growth of trees.

Note: This activity adapted from SCIS Evaluation Supplement.
Learning Activities

Human Environment

SENSE OF TOUCH

Objectives: P-1 and PBO-1 Inquiry/Observation
P-2 Inquiry/Classification

Materials: Blindfold, burlap, satin, apple skin, sandpaper, dirt, tree bark, concrete, flower petal, and water.

Procedure: 1) Blindfold student and have him identify the objects by feeling and touching only.

2) Have students bring in objects from around the school to try and fool their classmates.

Evaluation: Record results of 1) on Evaluation Form under PBO-1

Optional Activity: Have students bring in their own objects from home and repeat the procedure.

Note: Activity based on Instructional Objectives Exchange material.
Learning Activities

Human Environment

SENSE OF SIGHT

Objectives: P-1 Inquiry/Observation
P-2 Inquiry/Classification

Materials: Sense of Sight Exercise Sheet

Procedure:
1) Have students fill in the Exercise Sheet.
2) Once students are capable working with one category, encourage them to find objects that will fall into two or more categories.

Optional Activity: Have interested students describe unusual objects they have seen in the environment.

Note: Activity based on Instructional Objectives Exchange material.
Name an object in your surroundings, either indoors or outdoors, which has each of the following properties.

1. **Shape:**
   - round
   - oblong
   - square
   - triangular

2. **Size:**
   - small
   - medium
   - larger
   - gigantic

3. **Color:**
   - red
   - blue
   - green
   - purple
   - yellow
   - orange
Learning Activities

Human Environment

SENSE OF HEARING

Objectives:  
P-1 Inquiry/Observation  
P-2 Inquiry/Classification

Materials:  
Tape Recording of various sounds from the student's environment.

Procedure:  
1) Have students write down what they think each sound is. After tape is over, discuss answers and the need for careful observation using their sense of hearing.

2) Sounds recorded include: faucet drip, television, telephone, cooking food, adding machine, salt, pebbles, beans, pennies, a bell, paper being crumpled, a pencil sharpener, a bird singing, a river flowing, the wind blowing, waves breaking, cars honking, a truck accelerating, and people walking.

SENSE OF SMELL

Objectives:  
P-1 Inquiry/Observation  
P-2 Inquiry/Classification

Materials:  
Small opaque bottles with chocolate, peanut butter, baby oil, lemon juice, cinnamon, and cigarette ashes.

Procedure:  
Have students use their sense of smell to identify the various odours.

Optional Activity:  
Use common kitchen herbs and spices to expand the activity.

Note: Both activities on this page are based on material from the Instructional Objectives Exchange.
Learning Activities

Human Environment

THE SCHOOL ENVIRONMENT

Objectives: C-9 Human Environment/Environment  
P-1 Inquiry/Observation  
P-2 Inquiry/Classification

Materials: Paper and Pencil

Vocabulary: Environment

Procedure: 1) Have the students list 40 items in the classroom using all their senses.

2) After each student has completed the list, have them suggest possible classification schemes such as living or non-living, hard or soft, and solid, liquid or gas.

3) Have students classify their own lists.

4) Introduce the term ENVIRONMENT and discuss.

Optional Activity: Using magazine photos, repeat the activity.

THE HOME ENVIRONMENT

Objectives: C-9 and CBO-9 Human Environment/Environment  
P-1 through P-3 Inquiry/Observation, Classification and Definition

Materials: Paper and Pencil

Procedure: The evening before, have students write down 40 items in their homes. In class repeat classification exercise from The School Environment Activity.

Evaluation: Have students write an operational definition of the concept ENVIRONMENT. Record results on Evaluation Form under CBO-9.
Learning Activities

Human Environment

BAKER'S DOZEN

Objectives: P-6 and PBO-6 Value-Clarification/
Expression of Ideas and Feelings

P-7 and PBO-7 Value-Clarification/
Non-judgmental Responses

P-8 and PBO-8 Value-Clarification/
Detailed Examination of Position

Materials: Paper and Pencil

Procedure: 1) This activity is based on "Strategy
Number 75, Baker's Dozen" in Values
Clarification by Simon and others.
Refer to it for detailed explanation
of this activity. (See pp. 383-384)

2) During activity check to see that:

   a. The students are expressing their
      ideas and feelings. (PBO-6)

   b. The students are given non-
      judgmental responses. (PBO-7)

   c. The students are examining their
      positions in detail. (PBO-8)

Evaluation: Record results of 2) on Evaluation Form
under PBO-6, 7, and 8.
Learning Activities
Human Environment

TRANSPORTATION

Objectives: C-10 and CBO-10 Human Environment/Transportation
P-1 through P-5 Inquiry

Materials: Transportation Record Sheet

Procedure:  
1) Using the Transportation Record Sheet, have students keep record of both how and where they travel for a period of one week.

2) After collecting data, classify types of transportation under various headings.

3) Compare and contrast types of transportation as to speed, cost, purpose, enjoyment of ride and distance.

4) Have students list ten different types of transportation from fastest to slowest. Discuss advantages and disadvantages of speed. (CBO-10)

Evaluation: Record results of 4) on Evaluation Form under CBO-10.

Optional Activity: Have students draw pictures of different types of transportation.
<table>
<thead>
<tr>
<th>Type of Transportation</th>
<th>Distance Traveled</th>
<th>Average Speed</th>
<th>Comfort of Ride</th>
<th>Cost Per Mile</th>
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Learning Activities

Human Environment

THE COMMUNITY OF ROSAMOND

Objectives: C-11 Human Environment/Biological Needs
C-12 Human Environment/Social Needs
C-13 Human Environment/Human Community
P-4 Inquiry/Contrast Analysis/Comparison

Materials: Construction Paper for Maps

Vocabulary: Biological Needs of Man
Social Needs of Man
Human Community

Procedure:
1) Ask students to draw map of their neighborhood in detail (houses, trees, streets). Be sure they are labeled.
2) That afternoon after school, have students collect data about their neighborhood to make a composite map of Rosamond.
3) Make map of Rosamond on bulletin board labeling buildings and streets.
4) Make a list of the different types of buildings, noting how many of each type. Use different colors for each.
5) Discuss biological needs of man, especially food, shelter, clothing and water, in relation to how Rosamond fulfills these needs. Locate on map.
6) Discuss social needs of man, especially school, church, law, fire and injury protection, in relation to how Rosamond fulfills these needs. Locate on map.
7) Introduce term HUMAN COMMUNITY for a place that fulfills these social and biological needs.
Learning Activities

Human Environment

COMPARISON OF ROSAMOND AND LANCASTER

Objectives:  
C-11 and CBO-11 Human En./Biological Needs  
C-12 and CBO-12 Human En./Social Needs  
C-13 and CBO-13 Human En./Human Community  
P-5 and PBO-5 Inquiry/Generalization

Materials:  
Paper and Pencil

Procedure:  
1) List similarities and differences of the two communities, from student discussion, on chalk board.

2) Have the students answer this question: How are the biological needs of man met in these towns? (CBO-11)

3) Have the students answer this question: How are the social needs of man met in these towns? (CBO-12)

4) Have the students name ten things always found in a human community after discussing hypotheses, testing the hypotheses, and seeing if the generalization fits the communities of Rosamond and Lancaster. (CBO-13 and PBO-5)

Evaluation:  
Record results on Evaluation Form under CBO-11, 12, and 13, and PBO-5.
Learning Activities

Environmental Problems

VOICES OF EARTH

Objectives: C-14 through C-19 Environmental Problems/
Air Pollution, Renewable Resources,
Conservation, Solid Waste Pollution, Noise
Pollution, Recycling.

CBO-16 Environmental Problems/Conservation

Materials: Voices of Earth, State Adopted Supplemental
Text.

Procedure: 1) This activity serves as a supplement
to the other activities as a resource of
information. The nine chapters
deal with:
   a. air pollution
   b. forest conservation
   c. loss of vegetation
   d. water pollution
   e. water cycle
   f. preservation of beauty
   g. soil conservation
   h. urban degradation
   i. noise pollution
The chapters may be read individually
or orally as a group, with discussion.
It is suggested that the chapters be
read concurrently with the activities
on the same topic.

2) After Chapter 2 on forest conservation
has been read, have the students draw
a picture illustrating good forest
conservation practices, as shown in the
book. (CBO-16)

Evaluation: Record results of 2) on Evaluation Form
under CBO-16.

Optional Activity: Have students investigate local library for
books related to study of the environment.
Learning Activities

Environmental Problems

SCHOOL LITTER

Objectives: C-17 and CBO-17 En. Problems/Solid Waste Pollution

P-10 through P-15 Decision Making/Identification, Obtaining Information, Possible Solutions, Evaluations, Selection of Strategy, Action

PBO-10 Decision Making/Identification
PBO-13 Decision Making/Evaluation

P-18 and PBO-18 Social Participation/Directive

Materials: Several plastic garbage bags

Vocabulary: Solid Waste Pollution

Procedure:

1) Show students trash left in room after lunch.

2) Ask students to write down what they think the problem is. Ask what could happen if the waste was not cleaned up (PBO-10). Write ten sources of trash.

3) Discuss where the trash came from and who did the littering.

4) Have students write down possible solutions to the litter problem in the classroom and on the playground.

5) Evaluate the solutions through oral examination and discussion. Then have the students rank the possible solutions to the litter problem, stating their reasons for their order (PBO-13).

6) As a class, select the best strategy for solving the problem.
7) Actual performance by students is by picking up trash outside and keeping a list of people who throw trash. (PBO -18) Have students visit every classroom to advocate their solutions for the litter problem.

Evaluation: Record results on Evaluation Form under CBO-17, and PBO-10, 13, and 18.

Optional Activity: Have students draw anti-litter posters to be placed around the school and throughout the community.
Learning Activities

Environmental Problems

AIR POLLUTION MEASUREMENT

Objectives:  C-14 and CBO-14 En. Problems/Air Pollution

P-10 through P-15 Decision Making/
Identification, Obtaining Information,
Possible Solutions, Evaluations, Selection
of Strategy, Action.

P-17 Social Participation/Stimulative
P-18 Social Participation/Directive

PBO-11 Decision Making/ Obtaining
Information
PBO-12 Decision Making/ Solutions
PBO-17 Social Participation/Stimulative

Materials:  Paper Tissue, Three Different Models of
Automobiles.

Vocabulary:  Air Pollution, Smog

Procedure:  1) Have students discuss the meaning of
smog and air pollution. Identify
the problem.

2) Collect exhaust pollution from the
three cars on tissue paper. (PBO-11)

3) Discuss results of collection.
(CBO-14) Have students make drawings
of three vehicles that would not be
polluting. (PBO-12)

4) Display drawings and critically eval-
uate the proposed solutions to smog.

5) Select the best solution and discuss
how this might become reality.

6) Have students suggest how they could
help prevent air pollution. Riding of
bikes to school instead of coming on
bus or in a car is a good student
alternative. (PBO-17)
<table>
<thead>
<tr>
<th>Evaluation:</th>
<th>Record results on Evaluation Form under CBO-14, and PBO-11, 12, and 17.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional Activity:</td>
<td>Have students place vaseline coated microscope slides in various localities throughout the community. After three weeks, bring in the slides and examine under a microscope. Present findings to the class.</td>
</tr>
</tbody>
</table>
Learning Activities

Environmental Problems

SONIC BOOMS

Objectives: C-18 and CBO-18 En. Problems/Noise Pollution

P-9 and PBO-9 Moral Dilemma

Materials: Paper and Pencil, Noise Pollution Tape Recording.

Vocabulary: Noise Pollution, Sonic Boom.

Procedure: 1) Play Noise Pollution Recording while students carefully listen. Have the students then list five examples of noise pollution they heard on the recording. (CBO-18)

2) Discuss the noise pollution problem in Rosamond of sonic booms from Edwards Air Force Base. Develop the moral dilemma that the Base provides many jobs for people in the area while the sonic booms destroy property and ruin many turkey ranches.

3) Have students make well thought out decisions on what should be done. (This activity forces students to use moral reasoning at a level higher than their own in hopes that it will stimulate growth in moral reasoning).

Evaluation: Record results of 1) and 3) on Evaluation Form under CBO-18 and PBO-9.

Optional Activity: Using decibel meter, have students measure noise intensity in various locations around the community, identifying the cause of the noise and locating the dangerous areas on the classroom map of the community.
Learning Activities

Environmental Problems

POLLUTION IN ROSAMOND

Objectives: P-16 and PBO-16 Social Participation/ Informative

Materials: Paper and Pencil, Map of Rosamond from previous activities.

Procedure: 1) For one week have students write down localities of pollution in Rosamond, including the type of pollution and the severity of the problem.

2) After discussing the results, the students will locate and label the places of pollution in Rosamond on the map. (PBO-16)

Evaluation: Record results on Evaluation Form under PBO-16.

Optional Activity: Have students write down why pollution happened in Rosamond and how it might be prevented.
Learning Activities
Environmental Problems

POP-TOPS AND ALUMINUM CANS

Objectives: C-15 and CBO-15 En. Problems/Resources
             C-19 and CBO-19 En. Problems/Recycling

             P-10 through P-15 Decision Making
             PBO-14 Decision Making/Selection of Strategy
             PBO-15 Decision Making/Actual Performance

Materials: Bulletin Board Graph, Scale

Vocabulary: Renewable Resource, Non-renewable Resource, Recycling

Procedure:
1) Show students old beer cans or pop-tops. Identify the problem of littering.

2) Have students tell where they know there are discarded tops or cans.

3) Have students make possible solutions for the littering.

4) Evaluate the possible solutions. Recycling the tops or cans will be selected as the best solution.

5) The students will develop a strategy for collecting, counting and turning in aluminum for recycling in Lancaster. (PBO-14)

6) Have students bring in pop-tops or aluminum cans for recycling. (PBO-15 and PBO-19). Every few days count them and place data on graph. Weigh tops or cans to determine how many weigh one pound. Then students compute the worth of aluminum collected at 17¢/lb.
7) Sell aluminum to recycling center.

8) Explain to students how aluminum is recycled. Have students explain why this is a wise procedure. (CBO-19)

9) Discuss renewable and non-renewable resources. Have students make a list of five renewable and five non-renewable resources. (CBO-15)

Evaluation: Record results on Evaluation Form under CBO-15 and 19, and PBO-14, 15, and 19.
CULMINATING ACTIVITY
Culminating Activity

CITY OF THE FUTURE

Objectives: C-20 and CBO-20 Environmental Problems/Environmentally Sound Community

Materials: Various construction materials brought in by students.

Vocabulary: Environmentally Sound Community

Procedure:

1) Have the students design their cities of the future around their answers to the following questions:
   a. How many people will there be?
   b. What will life be like?
   c. Where will people work? sleep? eat? play?
   d. How will people get from one place to another?
   e. What will power the city?
   f. What material will be used to build homes?
   g. What are some of today's problems to be avoided?
   h. How will pollution affect the city?
   i. What recreation and entertainment should be provided?
   j. What will happen to the garbage and the litter of the city?
   k. Will schools and colleges be needed?
   l. What role will industry play?
   m. How will the city be made beautiful?
   n. Where will the food come from?
   o. How will the sick and the old be cared for?

(Questions adopted from Environmental Education Objectives for Grades 4-7, Instructional Objectives Exchange, pp. 126-127.)

2) After answering the questions the students should make a scale drawing of their city to be ecologically approved by the teacher. (CBO-20)
3) Each student or group of students then builds the city using materials they have brought to school. The model should reflect the learnings of the entire unit on Environmental Education.

Evaluation: Record results of 2) on Evaluation Form under CBO-20.
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