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ABSTRACT

This collection of class activities is intended to provide approaches to values discussion and clarification at all levels of the public school. Activities are presented for elementary school, junior high school, and senior high school pupils, and for ranges encompassing the entire range or various sequential ranges of grades. Subject areas involved in the activities include single subject areas or combinations of: science, mathematics, social studies, language arts, and fine arts. Each activity includes a purpose statement, grade level, subjects involved by discipline area, references, and an activity description. Activities place the student in a simulated circumstance where he or she must choose between conflicting values. (RE)

VALUES ACTIVITIES IN ENVIRONMENTAL EDUCATION

Selected and developed by

Mary Lynne Bowman

Foreword by

David L. Hanselman

ERIC Clearinghouse for Science, Mathematics
and Environmental Education
The Ohio State University
College of Education and
School of Natural Resources
1200 Chambers Road, Third Floor
Columbus, Ohio 43212

December 1979

ENVIRONMENTAL EDUCATION INFORMATION REPORTS

Environmental Education Information Reports are issued to analyze and summarize information related to the teaching and learning of environmental education. It is hoped that these reviews will provide information for personnel involved in development, ideas for teachings, and indications of trends in environmental education.

Your comments and suggestions for these publications are invited.

John F. Disinger
Associate Director
Environmental Education

Sponsored by the Educational Resources Information Center of the National Institute of Education and The Ohio State University.

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ABOUT THE AUTHORS

Mary Lynne Bowman is an Associate Professor of Environmental Education in the School of Natural Resources and a Research Associate at the ERIC Clearinghouse for Science, Mathematics and Environmental Education at The Ohio State University. Dr. Bowman teaches Natural History, Natural Resource Education Programs in the Urban Setting, and Environmental Education in the Park Setting, and has conducted many Environmental Education workshops for teachers. Her publications include Environmental Education 1975: A State-by-State Report; Environmental Education in the Urban Setting: Rationale and Teaching Activities; Land Use Management Activities for the Classroom; Recycling Activities for the Classroom; and Energy Activities for the Classroom: Vol. II.

David L. Hanselman is a Professor of Environmental Education/Communications in Environmental Science at the SUNY College of Environmental Science and Forestry, Syracuse, New York, where he directs the graduate program in the Environmental Education/Communications option. He has served as a consultant for the U.S. Forest Service on several projects and is active in the National Association for Environmental Education as well as the Conservation Education Association.

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FOREWORD

by

David L. Hanselman

During the late 1950s one of the top-rated TV shows was Dragnet. Each week hundreds of thousands of viewers tuned in to hear, "The facts...just the facts...." These words were invariably spoken as Detective Joe Friday (Jack Webb) talked to some bewildered victim of a crime who was more interested in telling how they felt about the event than in giving the hard facts--which would of course make it possible to solve the case.

One can speculate that the popularity of "just the facts" was symptomatic of a society at the pinnacle of confidence in the wonderous achievements of science and technology. After all, wasn't science uncovering the hard facts that would solve all our problems? A decade later we would see cracks appearing in the walls of Camelot. Perhaps the hard sciences were not able to lead us to Utopia. By the beginning of the 1980s almost everyone had come to accept that the way the world still operates--and probably always will operate--is governed as much by how people feel about things as by the cold, hard, logical application of "just the facts."

To the teacher, this means presenting learning experiences which integrate indisputable fact with feelings and personal values. The question, "How do you feel about that?" is finding its place in every subject taught. It's particularly germane in environmental education. We know from years of experience that facts and concepts knowledge alone does not necessarily result in changed overt behaviors. Especially voluntary behaviors!

To understand the place of values clarification in education, we should review. In simplest parlance, learning objectives seek to bring about change in one or more of these domains:

1. PSYCHOMOTOR: (mind + motor) Manipulative skills, how-to-do-it. You associate such words as "tune," "construct," "manipulate."

2. COGNITIVE: This is the kind of learning that has to do with facts--understandings--concepts. Ability to extrapolate information and make procedural decisions.

3. AFFECTIVE: This is the difficult one! It is concerned with attitudes, interests, values, beliefs and other such terms. Unlike psychomotor and cognitive changes, an affective change is an internal activity and external display of an affective change may be latent, and must be voluntary.

For years, educationalists have taught the above domains as three neat, distinct categories for behavioral change. But the truth is, that they are not totally distinct and separate. Only recently has learning behavior research verified what common sense has told us for eons: Cognitions can affect psychomotor performance. Attitudes influence cognitions. Cognitions shape our attitudes.

What does this mean in practical educational terms? It means that teaching for facts and concepts learnings is not sufficient. We must teach for clarity of relationship between the person and his society: "Attitude-cognitions" as some have called it.

It would be impossible to present a taxonomy of affective terms to which all would agree. Terms such as "attitude," "belief," "motivation" and "value" are used rather loosely. For our purposes, suffice to say that attitudes are enduring systems of positive and negative evaluations, emotional feelings, and pro or con action tendencies with respect to social objects. Values grow out of attitudes; they are what determines how a person is going to use his life.

John Dewey introduced the "values dimension" to education in his 1939 text, THEORY OF VALUATION. Louis Raths built on this theory and within the past 20 years has grown a new and exciting educational strategy commonly referred to as "Values Clarification." It's not a panacea, but it's practical, it works, and it gets right at the heart of the environmental educator's dilemma--teaching for voluntary or self-regulatory behaviors which are in equipoise with the environment. It's a "how" for developing an environmental ethic.

S T O P ! Bibliographies are usually placed at the end. That implies that the paper or text is complete and the references are offered only for those who want to know contributing sources or go further in their readings. No such intent is implied here. It is strongly recommended that you read one or more of these easily understood references before trying values clarification strategies:

VALUES AND TEACHING by Louis Raths, Merrill Harmin & Sidney B. Simon. (Columbus, Ohio: Charles E. Merrill, 1966.) The basic text on the "values clarification approach."

VALUES CLARIFICATION: A HANDBOOK OF PRACTICAL STRATEGIES FOR TEACHERS AND STUDENTS by Sidney Simon, Leland Howe and Howard Kirschenbaum (New York: Hart Publishing, 1972). Seventy-nine methods for values clarification are described, with instructions for the teacher and numerous examples of the basic strategies.

CLARIFYING VALUES THROUGH SUBJECT MATTER by Merrill Harmin, Howard Kirschenbaum and Sidney B. Simon (Minneapolis: Winston Press, 1973). A three-level theory of subject matter and examples of how every subject in the curriculum can be taught with a focus on values.

If you can't find these texts locally, write to National Humanistic Education Center, Springfield Road, Upper Jay, New York 12987. Ask for their publication list and workshop schedule.

Now let's review what we have learned from the literature:

1. Everyone becomes confused from time to time about values. Often, we find our presumed values and our actions in conflict.

2. We are bombarded by suggested or demanded values we "should" adopt:

   Moralizing ("Now I'm telling you that you should....")

   Laissez-faire ("I'm not going to intervene. You can think as you please....")

   Values-clarification ("Let's look at how we come to hold certain beliefs and behavior patterns....")

3. The values-clarification approach formulated by Louis Raths states "...whatever values one obtains should work as effectively as possible to relate one to his world in a satisfying and intelligent way." The process of valuing must satisfy all seven of the following requirements. Thus, the process of arriving at values is:

   (1) Choosing freely. If we don't make the choice for ourselves--if we're pressured--the result is not likely to be long lasting.

   (2) Choosing from among alternatives. It makes no sense to say one values breathing. You have no choice. For you to choose your values, choices or alternatives must be open to you.

   (3) Choosing after consideration of the consequences of each alternative. Note this well! Impulsive or whimsical choices are not a part of valuing. Cognitive learnings are crucial. Only when we weigh the consequences of each alternative (facts, concepts) can we make enlightened choices.

   (4) Prizing and cherishing. Something valued is something cherished--esteemed--respected. Something we hold dear. Thus, in the process of valuing, our feelings as well as our intellect come into play.

   (5) Affirming. When we have gone through the above steps in valuing, we are likely to affirm that choice publicly. If we feel very strongly, we may be willing to champion the cause. If, on the other hand, we are ashamed of a

choice--want to keep it a secret, we are not (according to Raths) dealing with values, but something else.

(6) Acting upon choices. Values influence our overt behaviors--the friends we make, the things we buy, the books we read, the causes we support. The person who talks about something, but never does anything about it, has not truly formed a value.

(7) Repeating. When we first act on a value, we are testing. When our behaviors are influenced again and again, we have really reached the stage where we have a value. Values may change throughout life, but more often they tend to have persistency and pattern a life.

4. A word of caution: Not everything is a value, nor should it be! In all of life we have short-term purposes, aspirations, beliefs which do not meet all of the seven criteria above.

5. If a values-clarifying strategy is to work, if it's really going to help the participants, the leader must:

(1) Foster an open, honest and accepting environment. Participants cannot feel that they risk ridicule by participation.

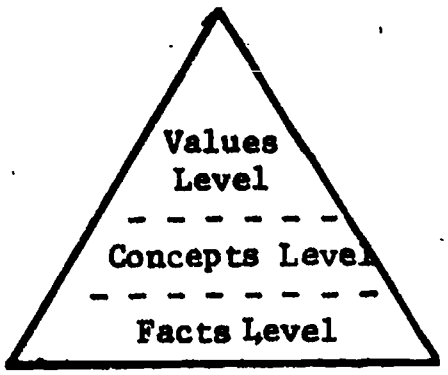
(2) Help the group to be good listeners.

(3) Really let the process work for itself. A leader is better to openly and honestly use values imposition techniques than to subvert the values-clarification process.

(4) Try not to moralize. (This is hard!) Watch your group--listen to yourself. Sure, you've got values and strong opinions. And it's perfectly all right to share them, but DON'T do it in such a way as to try to force a group or individual to your view. A confident leader will invite the group to say so if they feel pressured toward a position. THINK carefully how you will ask each question and avoid, "Don't you think that it's wrong if...."

(5) Participation must always be voluntary. If a member of the group wants to pass, always give him that right.

(6) Don't jump into values-clarifying activities until you and your group are ready for it. Remember, a very important (and early) part of the process is cognitive. Values clarification has been prostituted by many who "stack the deck" with their facts (or interpretations of them) so that the only logical choice (Raths', step three above) is the one the leader wants them to assume.



Thus: FIRST you deal with facts concerning nutrition, population growth and distribution....

SECOND you move to concepts about world trade, economics, social customs and mores....

THIRD you deal with values--"If YOU were the Secretary of Agriculture and...."

Once a person has gone through values clarification, so what? Are they better equipped to use cognitive information? There is an encouraging body of information which suggests they will. Take for example three major contemporary problems: smoking, teenage pregnancy and drug abuse. While "the facts" have been available to us for a long time, recent educational efforts which have included clarification of personal and social values have produced very encouraging results.

The key is that if we clarify our values--know what they really are and will defend them and act upon them--the decisions we make are less apt to be in conflict. If we value self, others and a healthy environment, then when we know the facts about pollution, energy conservation and so forth, we will choose to act in such a way that we cause minimal environmental degradation and seek out ways to contribute to environmental enhancement. It's that simple.

As teachers, it may sharpen our own perspectives if we briefly examine the way another group of communicators employ values and valuing. The advertising industry deals with the relationships between values and cognitive information in a very pragmatic manner. In mounting an advertising campaign, the question is usually asked, "Is our target audience going to respond in a rational or irrational way toward our subject?" We have all seen insurance ads with pictures of ambulances leaving the scene or bereaved families wishing that daddy had had a bigger life insurance policy. Here the crass message appeals to our irrational fears. On the other hand, look through the advertising in a specialty magazine such as those for the stereo or photography enthusiast. Most of these ads assume a knowledgeable, rational readership who will make enlightened choices based on fact.

While the educator cannot disavow the irrational nature of people, we constantly strive to develop rational thinking and behaviors. That's what values clarification in environmental education is all about.

If we believe (our values) that we should teach in a manner which fosters a sense of personal and social responsibility for the consequences of behavior, then values clarifying activities have a very definite place in environmental education. Read on!

David L. Hanselman

December, 1979

VALUES ACTIVITIES

Selected and Developed

by

Mary Lynne Bowman

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This resource booklet of values activities draws on ideas and materials developed by public school teachers which have become a part of the bank of teaching resources collected by the ERIC Clearinghouse for Science, Mathematics and Environmental Education.

Documents bearing ED numbers have been abstracted in Resources in Education, and generally may be located in ERIC microfiche collections, or may be ordered in microfiche or hard (paper) copy from:

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(703) 841-1212

EDRS prices are based on page counts, as indicated in current issues of Resources in Education.

Documents bearing SE numbers are in the local collection of the Information Reference Center for Science, Mathematics, and Environmental Education, and have not been announced through Resources in Education as this volume goes to press. Persons wishing to secure such materials should locate them from other sources; in most cases this will be the listed publisher or organization.

The activities, designed for student use in elementary through high school classes, are "action-oriented" and involve student participation. Each activity has been classified by the author according to the most appropriate level, subject matter and energy concept involved. In addition to being classified in these categories, each activity contains a statement of purpose on how the activity may be used.

It is hoped that the teachers who use these materials will recognize that the classified categories and statement of purpose serve only as a guide in selecting appropriate activities and should not be considered a fixed structure. In fact, it is recommended that teachers check for activities in the other grade level sections and subject areas that may be appropriate for use or to adapt for use for their own particular set of learners.

The references cited in specific activities found in the resource section of this booklet should be useful to persons interested in obtaining more values ideas and activities.

Mary Lynne Bowman

December, 1979

VALUE CONCEPTS IN ENVIRONMENTAL EDUCATION

Selected and modified from Roth, Robert E. Fundamental Concepts for Environmental Management Education (K-16). Unpublished doctoral dissertation, University of Wisconsin, Madison, 1969.

1. Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

   Pg. 32, 42, 63, 69, 71, 90, 99, 111, 131, 132

2. The management of natural resources is value-oriented.

   Pg. 19, 26, 29, 34, 37, 64, 74, 109, 118

3. Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

   Pg. 35, 52, 56, 57, 77, 84, 95

4. Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

   Pg. 36, 41, 51, 88, 94, 122

5. Man's decisions are a result of his values which may in turn result in personal responsibilities.

   Pg. 21, 27, 30, 98

6. Individuals perceive different self roles depending upon their values and their environment.

   Pg. 31, 55, 104, 112

7. The availability of and use of natural resources are affected by societal values.

   Pg. 17, 22, 24, 25, 58, 59

8. Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

   Pg. 28, 44, 45, 60, 97, 102, 105, 134

CLASSIFICATION OF VALUES ACTIVITIES

Grade Level:	Elementary school	
	Elementary-junior high school	
	Elementary-junior-senior high school	
	Junior high school	
	Junior-senior high school	
	Senior high school	
Subject Area:	Science	including health, nature studies, home economics, drivers education, etc.
	Mathematics	including arithmetic, geometry, industrial arts, etc.
	Social Studies	including geography, population, history, etc.
	Language Arts	including reading, creative writing, etc.
	Fine Arts	including music, art, theater, etc.

BREAKDOWN OF ACTIVITIES BY CATEGORY

(Some activities fall into more than one subject area.)

	Category	Number of Activities
Grade Level:	Elementary school	18
	Elementary-junior high school	4
	Elementary-junior-senior high school	2
	Junior high school	6
	Junior-senior high school	17
	Senior high school	8
Subject Area:	Science	27
	Mathematics	3
	Social Studies	45
	Language Arts	18
	Fine Arts	4

Values Activities In Environmental Education

Elementary School

PURPOSE: To stimulate awareness of the value of predators in the ecosystem.

LEVEL: Elementary School

SUBJECT: Science

CONCEPT: The availability of and use of natural resources are affected by societal values.

REFERENCE: Suggested by Susan Ahearn, Doctoral student, Science-Mathematics Education, The Ohio State University.

MATERIALS NEEDED:
Piece of cardboard (approximately 1 meter by 1-1/2 meters)
Level and stable surface (tabletop or 3 or 4 desks pushed together)
75 pennies or nickels
25 circular crumpled paper wads ranging in size from 2 to 10 centimeters

ACTIVITY: Discuss with your class the meaning of the words predator and prey. Point out that often people think predators are bad and feel very sorry for the prey. Now inform students they are going to participate in the following game that involves foxes as predators and rabbits as prey:

"Foxes and Rabbits Game"

Place the cardboard on a very level and stable surface, such as 3 or 4 desks pushed together, or a tabletop. Two sets of objects will serve as the rabbit population and the fox population. Rabbits will be represented by 75 pennies or nickels which are positioned on end across the playing board in a random fashion. The foxes will be represented by 25 circular crumpled paper wads ranging in size from 2 to 10 cm in diameter, with five representatives for each of the 5 sizes of paper wads. Since rabbits (the prey) are more prolific than are the foxes (the predator), they must be represented initially by a greater number of objects.

To begin the activity, students will stand at a distance of 2 meters from the board and will take turns tossing the paper foxes onto the playing board. The object is to knock over as many rabbits as possible in one throw. The first throw, that begins the activity, is done with a 10-centimeter paper fox. Each child is allowed as many throws as he/she has foxes at the beginning of his/her turn. If during his/her turn 10 or more rabbits are knocked down, double the number of foxes that were given to him initially. The additional foxes must be of the same size as the ones already possessed. The new foxes must not be added until the first set are thrown.

(The addition of the foxes represents the growth in population from an adequate supply of food.) After his/her turn, the existing fox population is passed on to another student. If a person does not knock down any rabbits, the fox that was thrown must be replaced with the next smaller-sized fox and another student takes a turn. (This represents the energy that was expended by the fox as it unsuccessfully hunted for prey and grew weaker and thinner.) If two children in a row are unable to knock down any rabbits, the population of foxes must be reduced by 1, and the last fox tossed must be eliminated.

Discuss the events as they occur. What do the various events mean? How does the population of foxes compare to that of the rabbits? Can you draw a graph to represent the growth or decline of the two populations? What happens if all of the rabbits have fallen down, but the next child has five foxes to toss?

When the game has been completed, discuss the meaning of the following:

> "The foxes need the rabbits and the rabbits need the foxes."

What is the value of a predator?

PURPOSE: To provide students with a positive experience with insects.

LEVEL: Elementary School

SUBJECT: Science

CONCEPT: The management of natural resources is value-oriented.

REFERENCE: Suggested by Susan Ahearn, Doctoral Student, Science Education, The Ohio State University.

ACTIVITY: Research shows that without positive experiences with animals such as spiders, snakes, and insects, children can develop unnecessary fears towards these animals. Certainly there are many instances when children will encounter a bee or wasp and get stung, or a spider and will remember a horror movie about spiders. The many positive aspects of insects often go unnoticed. An experience in learning to handle an insect can be a major hurdle which many children and adults should overcome. Here are a few ways to encourage studying live insects at close range:

1. "Hold" butterflies with a spring-type clothespin over the wings. Pass the animal to a friend by touching only the clothespin.

2. Cicadas (sometimes improperly called locusts) can be held between two fingers. If you are lucky enough to pick up a male from a tree trunk, it will "sing" by vibrating a membrane. The tickle that children feel is very effective in delighting children. Explain that the "song" is to attract a female.

(Emphasize that the children must be careful with the insect or it will get frightened. Usually an open palm will suffice for holding an insect. Do not squeeze.

Ask the children how they felt when they held the insect. How did it feel? Do any of the children seem reluctant to hold an insect? Let them know that they do not have to do so. Try to encourage reluctant children by offering to let the insect crawl from your hand to the child's and then on to your hand again as a hamster might do. Emphasize the beauty of color, shape and size of the insect rather than the traditional "creepy" aspects.)

3. Beetles can be held with thumb and forefinger placed around the body and over the wings. If the beetle tries to escape by flying, the wings are covered and it will not succeed. Some beetles have wicked-looking jaws. Most do not hurt even if they do bite. This method of holding the beetle will work well for biting-type beetles.

4. Most flies can be captured to be observed, by slowly bringing a clear glass jar directly over the insect. A fly usually takes off in a vertical way, and is immediately trapped. Put a lid on the jar. Pass the jar around to the students. There are hundreds of species of flies and some are beneficial. Many are colorful with elaborate behavior patterns.

5. Dragonflies and damselflies can be caught in wet meadows or near streams and ponds. They are beneficial predators on mosquitoes so they are called "mosquitohawks." Hold these insects by the wings and observe the mouthparts. They are used for chewing, not biting humans.

PURPOSE: To demonstrate that choices we make often have consequences.

LEVEL: Elementary School

SUBJECTS: Science (Health Education)
Mathematics

CONCEPT: Man's decisions are a result of his values which may in turn result in personal responsibilities.

ACTIVITY: Ask your students to name their favorite kind of cereal. How many chose pre-sweetened cereal and how many chose unsweetened? Survey those that chose unsweetened to determine how many add sugar to their cereal. Add this number to the pre-sweetened category. Which is more popular?

Now, ask how many are allowed to always eat their favorite cereal with sugar. Why might some of their parents object to their choice of cereal and decide that it is not good for them to eat cereal with sugar? Point out that sugar causes tooth decay and that by choosing to eat sugar, you run the risk of harming your teeth. Often choices we make in our daily lives involve risks and that when we choose to do something we like, we should think of the consequences of our choices. Relate this to choices we make about our environment. For example, litter is caused by some people choosing not to take the time to properly dispose of trash. What if everyone made this choice? What are other choices we make about our environment that have consequences?

PURPOSE: To discuss how energy consumption is affected by values people hold.

LEVEL: Elementary School

SUBJECTS: Science
Social Studies

CONCEPT: The availability of and use of natural resources are affected by societal values.

REFERENCE: Ruth Bakke. Energy Conservation Activity Packet: Grade 5. Iowa State Department of Public Instruction, Des Moines; Iowa State Energy Policy Council, Des Moines. 1977. ED 146 047

Lead a class discussion on the shortage of energy facing the United States and the rest of the world. After discussing the problems, ask the students if there is anything that they themselves can do to conserve energy. Then ask if any students and their families already try to conserve energy and in what ways they do so. Encourage them to share their energy conservation efforts by volunteering some of your own. An example might be rinsing and reusing plastic bags since petroleum is used in manufacturing plastic.

Pass out copies of the following questionnaire to all students. Ask the students to respond to each item with "Yes," "No," or "Maybe" by circling one of the symbols (Y, N, or M). After completing this, have each student read to the class one question which he/she has answered with an emphatic "Yes" or "No" and tell why he/she answered that way. (You may wish to extend this activity by having the students make their own lists of "I Am Someone Who" sentences.)

Discuss what might happen if people consistently behaved in the various ways suggested by the questionnaire.

Are you someone who...

Y	N	M	1.	will depend on a car for the majority of your transportation?
			2.	will wear warmer clothes in the winter and keep the thermostat lower?
			3.	will insist on using an electric or gas clothes dryer even on warm sunny days?
			4.	keeps shades drawn on the windows in the summer to keep it cool?
			5.	turns off the lights whenever you leave a room?

6. will continue to recycle even though others make fun of you?

7. encourages others to conserve energy?

8. leaves the radio or television on whenever you leave the room for long periods of time?

9. would rather play electronic TV games than take a walk outdoors or play softball?

10. stays in the shower until all the hot water is used up?

11. talks a great deal about the energy shortage but keeps using all your appliances?

12. believes we will be giving up the good life if we cut our use of energy?

13. is likely to become increasingly involved in energy conservation?

14. is willing to work for energy conservation by running for and holding a public office?

PURPOSE: To help students recognize some of the wasteful habits our current lifestyle supports.

LEVEL: Elementary School

SUBJECTS: Science
Social Studies

CONCEPT: The availability of and use of natural resources are affected by societal values.

REFERENCE: Ruth Bakke. Energy Conservation Activity Packet: Grade 6. Iowa State Department of Public Instruction and the Iowa State Energy Policy Council, Des Moines, Iowa. 1977. ED 146 048.

ACTIVITY: Discuss with your class how energy may be saved by not wasting things. Anytime something is wasted, the energy used to produce that thing is also wasted. Throwing away uneaten foods and recyclable materials is a waste of much-needed energy.

Help your class develop a list of things often wasted in their homes. Their lists should include such common products and items as food, water, paper, electricity, gas, soap and other cleaning products, hot water, and paper towels. Have your students record on a daily chart for one week their personal scores on saving or wasting. Each time they do something which saves energy they are to give themselves a plus (+) and each time they waste energy they are to give themselves a minus (-). At the end of the week discuss their score-keeping experiences. Where did they save the most energy? When was it most difficult to save energy? Were they successful in changing wasteful habits? Did they discover themselves to be more or less wasteful than they had previously thought? Do they feel as though they were making a personal sacrifice during the week? How many felt a sense of satisfaction for their efforts? How many intend to keep trying to conserve energy? Were family members influenced by their "waste consciousness"?

As a follow-up activity, have your class list household items which can be used again (paper bags, aluminum foil, plastic containers). Then have each student check (✓) the items that his/her family recycles. Finally, items may be ranked in order of recycling frequency. This activity might be made more meaningful by having each student select a single product (i.e., brown paper lunch sack) and recording the number of times it is used in the space of two weeks.

PURPOSE: To promote understanding of the necessity for wise use of natural resources.

LEVEL: Elementary School

SUBJECTS: Science
Social Studies

CONCEPT: The availability of and use of natural resources are affected by societal values.

REFERENCE: Karen Manget and Irene Rodriquez. Environmental Awareness Activities: K-3. Hillsborough County Public Schools, Hillsborough, Florida and Florida Department of Education, 1974. SE 024 520.

ACTIVITY: Ask your students to name some items they use frequently in their everyday lives that commonly wear out. For example: We wear out shoes, jeans, appliances, favorite toys and books. Point out that there are also some parts of our environment that we can "wear out." For example: We can "wear out" our favorite fishing hole by over-fishing or by polluting the water with waste materials. We can "wear out" a current source of electricity by using up all the coal under the earth's surface. What other parts of the environment can we "wear out"? How would our daily lives be affected? Have we already worn out some parts of our environment? (Example: Land--crop land that has been over-planted; pasture that has been over-grazed; eroded soil from misuse and/or overuse.)

Point out that some things in our environment were "worn out" before your students were born such as the buffalo herds that used to roam the West or some lakes and streams that used to be good for fishing and swimming and are too polluted now for either activity. Should people worry about whether the environment gets "worn out" for their grandchildren's sake (future generations)? Why? Why not?

As a class project, make poster collages from magazine pictures showing some things in our environment we don't want to wear out and some worn-out parts of our environment.

PURPOSE: To help students examine and describe possible long-range effects resulting from an action.

LEVEL: Elementary School

SUBJECTS: Science
Social Studies

CONCEPT: The management of natural resources is value-oriented.

REFERENCE: Project Learning Tree. A Supplementary Guide for Grades K through 6. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Pose the following situation to your students:

> *We have six fully grown trees on our land. We have no other trees around our house or anywhere else on our land. We need firewood and are trying to decide whether to cut all the trees down during next winter to use them for firewood.*

Given the information, try to decide what seems to be the best action to take.

Consider:

What will happen next summer when it gets hot. (No shade.)
What might happen the following winter when more firewood is needed to keep warm? (No fuel for cooking and heating.)
What problems might there be for animals? (Fewer places for some birds and squirrels to live.)
What might a person do to be sure that there are trees left for the future? (For example, each time a tree is cut two could be planted.)

Through discussion, emphasize to the students the differences between short term and long-term results of actions they recommend. Ask the students to describe the long-range effects of any action they recommend.

PURPOSE: To suggest that personal choices often require individual sacrifices.

LEVEL: Elementary School

SUBJECTS: Science
Language Arts
Fine Arts

CONCEPT: Man's decisions are a result of his values which may in turn result in personal responsibilities.

ACTIVITY: Invite your students to think of an animal they would most like to have as a pet. You might ask them to create a drawing and a short story describing their choice. After each student has had a chance to share his/her "pet wish" with the rest of the class, instruct them to research the initial cost, type of care their chosen pet will require, cost of care--both medical and food, housing needs, etc. Perhaps a local veterinarian could be invited to discuss care and cost of pets with the class to aid in their research.

After the students have collected information on the cost and care of their pets, pose questions as to whether they have the required facilities and income to properly care for their animal. Would they be willing to spend any allowance they might receive or do odd jobs for the privilege of having such a pet? Can we think of pets that would be less costly and require less care than the ones we have chosen? Would anyone be willing to substitute the lesser care/cost pet for theirs? Why/Why not?

PURPOSE: To suggest to students that family traditions often influence the things we like to do.

LEVEL: Elementary School

SUBJECTS: Social Studies
Language Arts

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

ACTIVITY: Pick a holiday that is celebrated by the students in your class and ask your students to describe special things such as menus and activities their individual families observe on this day year after year. They might wish to check with their parents to find out if these special family traditions were also observed when they (parents) were the age of your students. Poll the class to see how many think they will continue these traditions when they are adults and have children of their own. Were there any traditions described by other class members that any of them would like to observe? If so, what would they eliminate from their usual activities? Do they think their parents would agree to the changes? Why? Why not? There are no right or wrong ways to celebrate a holiday. We often do things in families that are examples of values held by our forebearers. Religious beliefs would be another example. What other values do we hold that are passed down from generation to generation?

PURPOSE: To help students express their reasons for preferring certain environments.

LEVEL: Elementary School

SUBJECTS: Language Arts
Social Studies

CONCEPT: The management of natural resources is value-oriented.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades K through 6. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Ask your students to collect pictures of different attractive and unattractive environments (preferably all in color or all in black and white), including such places as urban office buildings, suburban shopping centers, forests, deserts, old houses, contemporary homes, mountains, lakeshores, ocean beaches, farms--the largest variety possible. Number the pictures and display them in random order.

Ask each student to select, in order, the top five choices and the last choice of places in which he or she would like to spend a specified number of hours or days. If appropriate to the students' learning, ask each student to write down or tape-record reasons for selecting the places.

Discuss the reasons in class. Find out if different people chose the same environment for different reasons; for the same reasons. Find out if what the students thought they could do in these environments affected their choices.

After this brief discussion, ask your students to close their eyes. While sitting comfortably in the classroom or outside and with their eyes still closed, guide the students through an imaginary trip in their minds to the places they selected as their first and last choices. Once the students have traveled to these places in their minds, ask them to open their eyes.

After some sharing of what they saw and felt, ask the students to write a description of an imaginary day spent in the environments of both their first and last choices. Ask students to include in their descriptions possible reasons for their dislike of a certain environment and how they would change it to make it more appealing. Once written, ask the students to share their descriptions, including their suggestions for environmental improvement. Talk with the students about how such suggestions relate to current public demands for a quality environment.

PURPOSE: To suggest that if we feel strongly about our likes and dislikes, we not only will state them publicly but should be willing to affirm them by our actions.

LEVEL: Elementary School

SUBJECTS: Social Studies
Language Arts

CONCEPT: Man's decisions are a result of his values which may in turn result in personal responsibilities.

REFERENCE: Suggested by David L. Hanselman, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: Prepare the group for a silent walk (it could be through a school building or along a woods trail). Discuss how we often shut things out--we don't really hear all the sounds, see all the sights, smell every odor, feel every texture. The object of the walk is to sense everything--everything that pleases us, everything that displeases us. At the end of the walk (keep it short), discuss what people sensed--what things were pretty much uniformly liked and disliked. On what things is opinion divided? How have we as individuals contributed to what we liked and what we disliked?

PURPOSE: To increase communicative skills and become sensitive to other people's values.

LEVEL: Elementary School

SUBJECTS: Language Arts
Fine Arts
Social Studies

CONCEPT: Individuals perceive different self roles depending upon their values and their environment.

ACTIVITY: Ask your students to think about a special place that makes them feel good. Have each make a list of five reasons his/her place is special.

Now, ask each to find five objects that describe something good about his/her special place. For example: a sweet-scented flower may describe a "special place" that smells good or a piece of wool might describe a special place chosen because it is warm. Have each student verbally share, either in small groups or with the rest of the class, why their objects are like their "special place." Discuss the following:

-- Can others guess where the special place is?
-- What does a chosen place tell about the person who likes it?
-- Would most like to share their special place with everyone? With one person? Why/Why not?

PURPOSE: To demonstrate how group decisions affecting private citizens and the public are made, through participation in a land-use simulation.

LEVEL: Elementary School

SUBJECT: Social Studies

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades K through 6. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Prepare a scenario describing a hypothetical situation for distribution to students:

There are 50 summer cabins on Lincoln National Forest land along Bear Creek. The sites for these cabins were leased to private citizens 30 years ago. At that time there was very little forest recreation in this area.

Since then, the nearest city has grown tenfold. Recreation in the Bear Creek area is almost 20 times what it was 30 years ago.

Some people feel that those 50 cabins should no longer be permitted to dominate that area of Bear Creek and that the land belongs to all of the people.

Should 50 families have Bear Creek to themselves or should their leases be terminated and the cabins removed? Should the cabin owners be allowed to remove the cabins? Should they be reimbursed for their value?

Divide the class into these three groups:

1. Three or four members to represent the Forest Service Advisory Board. They will conduct a hearing and arrive at a decision.
2. Half of the remainder of the class will role-play the cabin owners.
3. The other half of the remaining students will represent the general public.

Allow the "cabin owners" and "general public" time to prepare testimony stating their reasons for either renewing the leases or abolishing them. During this period the U.S. Forest Service Advisory Board should plan the hearing procedures, specifying who testifies, for how long, and in what order.

When all groups feel they are ready, the hearing should be convened. After the testimony has been presented and opportunity for rebuttal provided, the Advisory Board should meet briefly to reach a decision. They should then return and report their decision to the entire class, explaining the reasons for their decision.

Following this simulation, discuss with the students the means by which such land-use decisions are made in your local region.

Note: It is useful to have the classroom arranged as a hearing room for the meeting or to find an available auditorium.

PURPOSE: To illustrate a societal conflict relating to use of the environment.

LEVEL: Elementary School

SUBJECT: Social Studies

CONCEPT: The management of natural resources is value-oriented.

ACTIVITY: Pose the following situation to your class: Mr. A and Mr. B are neighbors. Mr. A is unemployed due to a physical handicap. He does, however, earn income from keeping several beehives and producing honey. Mr. B and his family are sensitive to mosquito bites. Their city will provide fogging services during the mosquito season for those citizens requesting the service. However, fogging kills Mr. A's bees as well as Mr. B's mosquitos. Thus, if the area is fogged, Mr. A loses his income; if it is not, Mr. B's family may be bitten by mosquitos. Who has the right to make the fogging decision in this situation? After a class discussion, check with local authorities to determine how this problem would be handled in your community.

PURPOSE: To assess students' response to a mandatory cut in energy use.

LEVEL: Elementary School

SUBJECT: Social Studies

CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

ACTIVITY: Ask your students to make a list of the ten things they like to do most. You may wish to develop a histogram on the chalkboard to determine the activities that are the most popular with your students. Now, ask the class to put an asterisk beside every activity that uses either electricity or gas. Remind your students that if their favorite activities require car/bus transportation, gasoline is consumed. If their chosen activities are held in a public building such as a school gymnasium, electricity and possibly gas are consumed.

Now announce that the President of the United States has declared an energy crisis and that every person must cut gas and electricity usage by 25 percent. Anyone not obeying this edict is breaking the law and will be prosecuted.

Ask your class what they would do. Would they cut out any of their favorite activities? Would they give up everyday conveniences? Why?

PURPOSE: To demonstrate that we usually rate our surroundings according to how useful they are to us.

LEVEL: Elementary School

SUBJECT: Social Studies

CONCEPT: Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

REFERENCE: Phillip E. Powell, et al. Man and Environment. Environmental Education Office, Arkansas Department of Education, 1974. ED 107 484.

ACTIVITY: Take a field trip with your class on the school grounds to rate the school environment. Ask your students to make three tests as follows:

1. Things I see that I love
2. Things I see that I hate
3. Things I see that have little value to me

Instruct the students to try to have at least five things on each list and not to list any one "thing" more than once. It should also be stated that people are not things and are not to be included on their lists.

After the lists are completed, ask the students to rank in order of priority the things on each list; i.e., what in my school surroundings do I love most? Hate? Is most unimportant? Compare lists and discuss why students made their particular judgments about things in the environment. Point out that usually the things we like best are those things we find the most useful to us as individuals. Things we like least are usually related to the fear that these things might in some way hurt us.

Ask students whether the things they listed that had little value to them might be valuable to someone else? Might they someday become valuable to them? Do they use any of these things? Might they ever? Should we eliminate things in our surroundings because we don't use them? Why/Why not?

PURPOSE: To suggest that life styles are related to natural resource usage.

LEVEL: Elementary School

SUBJECTS: Mathematics
Social Studies

CONCEPT: The management of natural resources is value-oriented.

ACTIVITY: Share with your students that the average person in the United States uses 100 gallons of water per day. The average person in Great Britain uses 50 gallons of water per day. The average person in an underdeveloped country uses 5 gallons per day.

Now ask the following questions:

How much more water does a person from the U.S. use than a person in Great Britain?

How much more water does a person from the U.S. use than a person from an undeveloped country?

What might account for these differences?

What do these differences say about the way people live in the different countries?

Do you think a person in an underdeveloped country would prefer to live the way a person in the U.S. lives? Why?

What if everybody in the world used the amount of water per day that the average person does in the United States?

Values Activities In Environmental Education

Elementary-Junior High School

PURPOSE: To demonstrate how sometimes things we don't see as having much value can suddenly become valuable.

LEVEL: Elementary, Junior High School

SUBJECT: Science

CONCEPT: Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

REFERENCE: Lamont C. Cole, Ecologist, Cornell University, Ithaca, New York.

ACTIVITY: Share with your students the following story cited by Dr. Lamont C. Cole of Cornell University:

Borneo was having a high incidence of malaria, which is carried by mosquitoes. A World Health Organization entered into a program to spray DDT on the island to kill the mosquitoes. The mosquitoes were killed. Roaches which also inhabited the area weren't killed by the DDT even though the DDT became concentrated in their bodies. Lizards that fed on the roaches got enough DDT in their bodies to affect their ability to run from their predators, the cats. The cats were thus able to catch lots of lizards and when they ate the lizards they also ate DDT which was fatal to them (cats). Cats also ate rats and as the cats died, the rat population began to increase and the rats also began to move into the native villages since the cats were dying. Rats cause plagues to humans; so, it was decided to import more cats into the villages to get rid of the dangerous rats. Since the lizards were gone and cats don't exist on roaches, the cats were not affected by the DDT and the rats began to disappear from the villages.

However, now the thatched roofs of natives' houses began to cave in and a great influx of caterpillars was noticed. The caterpillars were munching on the grass thatching of the roofs. It was now discovered that the lizards had also eaten caterpillars as well as roaches.

Ask your students to identify the changes in the value of the animals in the story. Can you cite examples of value changes and their causes in our own country? What is the moral of the story?

PURPOSE: To examine an environmental problem and help students formulate possible courses of action toward solution for the problem.

LEVEL: Elementary-Junior High School

SUBJECTS: Social Studies
Science

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Charles T. Vizzini, Project Director. Valuing The Environment-Secondary. Charlotte-Mecklenburg Environmental Education Project, Charlotte, North Carolina. June, 1975. ED 134 449.

ACTIVITY: Divide your class into groups of four or five. Assign each group a specific area on your school grounds and/or surrounding community to examine for litter. Ask each group to either list or collect examples and as a group to decide whether or not litter is a problem in their assigned area. Have each group share their findings with the rest of the class. Hold a discussion on what makes something a problem. What criteria did the groups use to decide whether litter was a problem in their areas? Compare and contrast the specific group areas. Were some areas considered to have more of a litter problem than others? Are their certain environments that people tend to litter more than others? Ask your class to offer realistic solutions to the problem litter areas. After they have explored possible solutions, give each student the following "ballot" and ask them to "vote" on each answer:

LITTER BALLOT

1. I believe I should pick up litter I see even though I did not drop it. ____ Yes ____ No
2. I believe I should tell anyone I see littering to stop and pick up their litter. ____ Yes ____ No
3. It makes no difference to me whether people litter or not. ____ ____ No
4. I would be willing to pay out of my own money for someone else to pick up litter. ____ Yes ____ No
5. I believe I should report a litterer to authorities. ____ Yes ____ No
6. I would be willing to pay out of my own money for authorities to catch and punish litterers ____ Yes ____ No

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After the votes have been cast and counted, report the results. Now return to the previously suggested solutions to latter problems and discuss whether on the basis of class voting the proposed solutions would work with the students in your class. Is there any conflict between what students see as a problem and propose as solutions and what action they say they would be willing to take?

PURPOSE: To identify characteristics of a community that students perceive as being important.

LEVEL: Elementary-Junior High School

SUBJECT: Social Studies

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

REFERENCE: Suggested by Rebecca Wright, Graduate student in the School of Natural Resources at The Ohio State University.

ACTIVITY: Create an imaginary community for your class by collecting and sharing magazine and newspaper articles about specific communities. Include articles dealing with what you (and others!) consider to be community problems and community strengths. Be sure to include a few articles about your own community for added interest. Your articles might range from an editorial blasting the local highway department for the community's worst traffic snarl to a national magazine's recognition of an excellent city park system or green space project.

Read and discuss the articles impartially with your students. Ask them what they consider to be the problems of the imaginary community. Which problems are most serious and why? What do they consider to be the community's good points? Why?

Announce that each student has the opportunity to participate in planning a new community of which they will be citizens. How would they want it to be different from the present community? What do they believe to be the most important characteristics their community should have? Which problems would they try to solve? What are some possible ways to solve these problems?

PURPOSE: To examine ways animals are portrayed in children's literature and determine the images that are often conveyed as to their roles.

LEVEL: Elementary-Junior High School

SUBJECTS: Language Arts
Fine Arts
Science

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

REFERENCE: Suggested by Susan Ahearn, Doctoral student, Science-Mathematics Education, The Ohio State University.

ACTIVITY: Animals are often portrayed in children's literature as being like human beings in that they are able to speak, wear clothing, live in houses, and exhibit human characteristics such as a fox being cunning, a wolf being evil, or a crow being either a thief or conceited and foolish. This is known as being anthropomorphic or showing anthropomorphism. Certainly fairy tales are clever and enjoyable and they sometimes teach a valuable lesson. However, unless children are provided with experiences that portray the animals in their actual roles in the ecosystem, children will retain their misconceptions about these animals into adult life. Therein lies the danger. For example, many people think of deer and fawns as graceful, inoffensive, gentle, and lovely. But an adult deer is about as safe as a rattlesnake, poised inches away from your foot.

In fact, it is probably less safe since everyone recognizes a rattlesnake as extremely dangerous. Most people do not know how deadly a buck deer can be. Hundreds of people have met tragic deaths from does and bucks. People need to realize that antlers are fighting weapons that the bucks use in their struggles against rival bucks for possession of does. The animals that are perceived of as bad, have often received no human consideration when their needs directly interfered with man's. Many other animals are maligned by our stories. Animals that are predators kill because they need to eat <u>not</u> because they are killing machines.

Let's examine some children's literature related to animals and find out the rest of the story. Select the following stories to share with your students:

1. Aesop's Fables - "The Fox and the Crow"
   "The Fox and the Grapes"
2. "Reynard the Fox"
3. "The Gingerbread Man"

4. "The Musicians of Bremen"
5. "Little Red Riding Hood"
6. "Peter and the Wolf"
7. "Three Little Pigs"
8. "Who's Afraid of the Big Bad Wolf?"
9. "The Wolf and the Three Kids"
10. "Little Miss Muffet"
11. "The Wizard of Oz"
12. "Bambi"
13. "Peter Pan"
14. "The Monkeys and the Crocodile"
15. "Three Billy Goats Gruff"
16. "Peter Rabbit"
17. "Goldilocks and the Three Bears"
18. Bible Stories such as Old Testament - "Jonah and the Whale"
"Leviathon"
"The Serpent and Eve"
"David Saving his Sheep from a Lion and a Bear"

The first four stories relate to how the fox is portrayed in literature. Help the children select words to describe their perceptions. Perhaps they will come up with words like crafty, evil, sly, smart, cunning. In the "Musicians of Bremen," there are several versions. One version illustrates the "good guys" or the musicians as the rooster, the cat, the dog, and the donkey. The "bad guys" are the fox, the wolf, the pig and the boar. Clearly there is anthropomorphism.

Ask the children to name several examples. More important, however, is the goodness or badness of the roles portrayed. Do the illustrations alone depict the animal in an unfavorable way? Is the story emphasizing the idea that "big" means "bad"? Ask the children to rewrite the story of their choice, depicting the animal in either a favorable role or one that is more closely related to the animal's real nature. This may encourage some students to do research into books for more information. Repeat these exercises with all of the stories.

Stories numbered 5-9 relate to the portrayal of the wolf in children's literature. Perhaps wolves are considered evil because of their habit of howling and hunting in packs. Certainly everyone feels sorry for an underdog. But wolves have been found to be an important "natural safety valve" on populations of deer, moose, rabbits and other small animals. In Isle Royale, Minnesota, they are the major reason that the moose population has not exploded and destroyed itself from disease and starvation. It has been clearly proven that there are no cases of a wolf in North America attacking a human being. The only cases in which it may have happened is when an animal had rabies. The wild tales from Europe, Canada, and Alaska are complete fabrication.

Exaggeration is often utilized in the stories for children. For example, examine "Peter and the Wolf" and the "Wolf and the Three Kids." What was the outcome of the duck in the former and the kid goats in the latter? Are these animals usually eaten by wolves in the wild? Are they found in the wilderness habitats of wolves? Ask the children to rewrite one of these stories, switching the roles of the characters so that the bad are good and the good are bad. Ask them to illustrate their stories. Share the stories with other members of the class and discuss the importance of illustrations in conveying the impression of "goodness" or "badness."

The lion, "king of beasts," is usually depicted as displaying great courage, pride and ferocity. Yet, consider the natural history of the actual animal. The male lion is the original "male chauvinist pig" (how anthropomorphic). He lies around in Africa under the trees out of the sun awaiting the females of his pride or band to return from the hunt. He rarely hunts and usually never helps in the rearing of the cubs. Contrast the image that this information conveys with the impression given in the "Wizard of Oz."

Consider the crocodile. We have heard of Captain Hook's fate in Peter Pan. Yet, isn't it strange that such a voracious creature does not eat the Egyptian plover (a small bird) that regularly picks at the inside of the crocodile's mouth, removing unwanted particles? The relationship with the crocodile is one of usefulness. The bird also warns the crocodile of approaching danger. The crocodile provides the bird with its food, found in the open mouth of the great lizard.

Many animals prey on rabbits and it's a blessing in disguise. Rabbits can live up to five years in the wild and a female rabbit can have up to eight litters in one season. That's a total of about 35 baby rabbits per female if a litter has between four and five, but up to nine young rabbits. A female rabbit can have a new set of young ones every month. That's a lot of rabbits.

Cartoons and speech expressions are filled with images of animals. Have you ever been called a "skunk"? Maybe you were being called an insect-eater. Are you "blind as a bat"? If so, then maybe you eat as many insects as they do. Can you think of other expressions? Ask the students to illustrate the expressions.

Here are some other animals that are often maligned in our stories:

jackals	cats	dragonflies	vultures
crows	whales	weasels	(buzzards)
bears	spiders	skunks	

Can you find more evidence in stories to support this theory?

What usefulness can you find for these animals in the ecosystem?

Values Activities In Environmental Education

Elementary-Junior-Senior High School

PURPOSE: To suggest that the more common something is, the less value it has.

LEVEL: Elementary-Junior-Senior High School

SUBJECTS: Science
Social Studies

CONCEPT: Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

ACTIVITY: Relate to your students the following:

Starlings were not native to the United States. However, they were common in England. In fact, they were described by Shakespeare as being a beautiful bird. In the 1800s, a group of people decided that we should import these beautiful birds and try to establish them in this country. They were first introduced in Cincinnati, Ohio in 1872 but were not really successfully established until 1890 in New York. They then began to grow in numbers at an astonishing rate and spread throughout the country. When they were first sighted in a particular area, people would flock to the site to get a glimpse of this beautiful new bird. Now they are found in great numbers everywhere in the U.S. and many people think of them as a nuisance. Sometimes people even refer to them as "trash birds."

Discuss possible reasons people have changed in their attitude toward these birds. Are there any other "trash" birds in your area? Even within the country, there are examples of different areas placing different values on certain things. For example, Midwesterners think it strange to visit San Francisco and see Goldenrod sold as a beautiful cut flower. It is considered a weed in the Midwest. Can you think of examples of things in your area that do not have much value but that might be very valuable in another part of the country and vice-versa?

PURPOSE: To examine conflicts that can be associated with life style options.

LEVEL: Elementary-Junior-Senior High School

SUBJECT: Social Studies

CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

REFERENCE: Judith M. Schultz and Herbert L. Coon. Population Education Activities For The Classroom. ERIC/SMEAC Center for Science, Mathematics and Environmental Education. Columbus, Ohio. January 1977.

ACTIVITY: The following letter appeared in the syndicated column "Dear Abby":

> Dear Abby: My husband and I have been married for nearly twelve years. We are childless and whenever we are asked if we have children and we say we haven't, someone always says, "Oh, isn't that too bad."
>
> We then say, "Not really. We never wanted any." Then they look at us like we are monsters.
>
> We feel that our lives are full and very rewarding without children. We are able to travel, do a great deal of civic, political, and humanitarian work we couldn't do if we were raising a family. And we are happy! We don't hate children. We like them. But we feel the world doesn't need any more.
>
> Please tell your readers that there are some perfectly sane people who do not want to be parents. I am tired of having strangers pity us when they learn we have no children.

Following a background discussion in the population problem, utilize this article to launch your class into discussion concerning life style options, and sex role stereotypes, in order to clarify values. Ask how many agree or disagree, and why. Relate to the population problem.

Values Activities In Environmental Education

Junior High School

PURPOSE: To identify ways values are formulated.

LEVEL: Junior High School

SUBJECT: Social Studies

CONCEPT: Individuals perceive different self-roles depending upon their values and their environment.

ACTIVITY: Discuss with your class that research indicates children of parents who completed high school tend to do better in school than children of parents with less education. Smoking statistics indicate that children of nonsmoking parents are less likely to become smokers than children of parents who use tobacco. What is indicated by these facts? (Adult value choices are often transmitted to children.) Explain that this is referred to as modeling. In other words, parents serve as a model to their children--perhaps even unconsciously.

Ask your class to make a list of five ways they intend to serve as models for their children when they become parents. Give each student a chance to share and discuss his/her list with the rest of the class. After the sharing period, ask if any would like to change his/her list. Was anyone influenced by the class discussion? What things seem most important to most students? What might this mean in terms of future life-styles?

PURPOSE: To examine attitudes toward big cities.

LEVEL: Junior High School

SUBJECT: Social Studies

CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

REFERENCE: Judith M. Schultz and Herbert L. Coon. Population Education Activities For The Classroom. ERIC/SMEAC Center for Science, Mathematics and Environmental Education. Columbus, Ohio. January 1977.

ACTIVITY: The United States contains at least 35 metropolitan areas with a population of one million or more. The three largest are New York area (10 million), Los Angeles area (7 million), Chicago area (7 million). Many persons have expressed concern about problems such as high crime rates, transportation, pollution, waste, water supply, garbage and waste disposal and others that seem, inevitably, to get bigger as cities grow in area and population.

Ask each student to interview, as homework, two adults (parents are permissible) with questions such as the following:

1. Do they regard big cities as good places in which to live?

2. Do they see big cities as a threat to the "American way of life"?

3. What, if anything, should be done to curtail growth of cities?

4. Do they believe the big cities may be the result of "too many people"?

Pool results obtained by class members and attempt to find agreement, if any, expressed by the adults interviewed. Ask each student to answer the same questions and search for agreement, if any, that exists among students. If adults and students disagree try to account for the differences.

PURPOSE: To suggest that it is difficult but sometimes necessary to give up things we value in our changing world.

LEVEL: Junior High School

SUBJECT: Social Studies

CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

REFERENCE: Suggested by David L. Hanselman, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: Select a site familiar to all in the group. Set the stage for creative speculation: "Everything is changing. Nothing stays the same. Cities grow, old buildings are torn down; new ones take their place. Forests have been cleared for farms and farms replaced by housing developments, airports and highways ...." Then have everyone take a piece of paper and divide it down the middle. List all of the "bad" things that might happen to this location on the left, all the "good" things on the right. Put a check beside those things you feel have the greatest likelihood of happening. Group discussion should follow. Use focusing questions such as, "Which changes would you work for? Against? What happens to us when those things we cherish seem inevitably doomed?...."

PURPOSE: To involve students in an examination of the renewable and non-renewable resources they use.

LEVEL: Junior High School

SUBJECTS: Science
Social Studies

CONCEPT: The availability of and use of natural resources are affected by societal values.

REFERENCE: Teacher's Resource Guide for Environmental Education. Arizona Department of Education, 1535 W. Jefferson, Phoenix, Arizona, 1976. ED 148 594.

ACTIVITY: Ask your students to list the renewable and nonrenewable resources they have used or consumed in the past 24 hours and identify each as (1) essential for survival, (2) necessary for maintenance of their present life-style, or (3) a luxury.

Students then should propose alternatives for each item listed in categories two and three which they believe are inefficient or wasteful. Compile a master list of the resources used and the proposed alternatives and discuss these questions:

1. Are any items listed in the "essential" category really not essential? What is your criteria for evaluating an item's necessity?

2. Are any items listed in the second category really luxuries? On what basis do you judge an item a luxury?

3. What would be the environmental and economic impact of your alternatives? Would they increase the use of renewable resources? (For instance, switching from aluminum foil to cellophane food wrap would accomplish this.) Or, would they increase the use of nonrenewable resources? (Switching from paper cups to plastic cups would have this effect.) Would they increase the use of energy?

4. Look at the list of luxury items. Which of these could you give up without a major change in your lifestyle?

5. Make a list, beginning with the easiest to give up and ending with the most difficult. Could you give up the top three items on this list for a day? A week? A month? Try it.

PURPOSE: To demonstrate potential problems in making resource management decisions when conflicting needs arise.

LEVEL: Junior High School

SUBJECTS: Social Studies
Science

CONCEPT: The availability of and use of natural resources are affected by societal values.

REFERENCE: Suggested by David L. Hanselman, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: Assign each student a tree. Some should have obvious timber value, others crooked and deformed. One or two might be landscape plantings. Strive to assign a wide variety of forms, species, vigor. Have everyone spend some time with their tree. You may need to suggest some alternatives before making assignments--lumber, paper, habitat for wildlife, erosion control, firewood, beauty, etc. After everyone has had an opportunity to become an "expert" on their tree, go around as a group and visit each tree. Have each person tell what their tree's values are, and prescribe a best use for the tree. Then open for group discussion. Concluding discussion may involve such questions as, "If you needed lumber to build a home, would your 'best use' be different? How should resource management decisions be made when conflicting needs arise? How do you make personal choices when alternatives conflict? Who should make the decision on how these trees are managed--the land owner, a State Forester, you?...."

PURPOSE: To investigate how life styles affect our environment and to design life styles suited to specific environments.

LEVEL: Junior High School

SUBJECTS: Science
Social Studies
Language Arts

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

REFERENCE: Rodney F. Allen, et al. Ways To Environmental Education Vol. IV. The Florida State University, May 1975. ED 113 203.

ACTIVITY: Discuss with your students that resources are what we have to work with. These include both human and physical resources. Resources don't determine our performance as people on earth, but how we decide to use these "resources" has a great deal to say about us as humans--who we think we are, what we value, and what we think we are about. How we decide as people together on our speck in the universe will greatly influence the quality of our lives.

Ask each student to clip from magazines a picture of a natural area and one of a man-made environment. Ask them to (1) design a life style for human performance in the natural area; and (2) describe in writing the life style or human performances that have been prevalent in the man-made environment. Students are to include in both tasks ways they might wish to change both environments and why. Relate how their choices of human performance are an indication of what they value and how what they value influences the quality of life in any given environment.

Values Activities In Environmental Education

Junior-Senior High School

PURPOSE: To examine a value issue related to modern American agricultural practices.

LEVEL: Junior-Senior High School

SUBJECT: Science

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Judith M.Schultz and Herbert L. Coon. Population Education Activities For the Classroom. ERIC/SMEAC Center for Science, Mathematics and Environmental Education. Columbus, Ohio. January 1977.

ACTIVITY: In response to the increased demand for food caused by rapidly growing populations world-wide, the American farmer has increased his production dramatically. Yields, per acre, of wheat, corn, and other food grains are much higher than they were one or two generations ago. How can this fact be reconciled with the concern of some scientists and conservationists who say the soil in America is being harmed at an alarming rate?

Develop, with input from the class, a list of factors that are necessary to secure high yields of grain--factors such as soil, weather, water, seed, fertilizer, pesticides, and herbicides. Most highly productive farms also make heavy use of power machinery and practice some aspects of mono-culturing.

Ask students to do library research or interview persons such as county agents or other agricultural specialists (including those who urge more "organic farming or gardening") to get information on the negative as well as the positive aspects of heavy irrigation, heavy use of chemical fertilizers, pesticides, herbicides, and mono-culturing. Share findings in a subsequent discussion period. To what extent, if any, do some or all these factors have a harmful effect on a farmer's soil? Why might a farmer continue a practice he knows to be harmful?

PURPOSE: To help students realize the value of insects through the roles they play in agriculture.

LEVEL: Junior-Senior High School

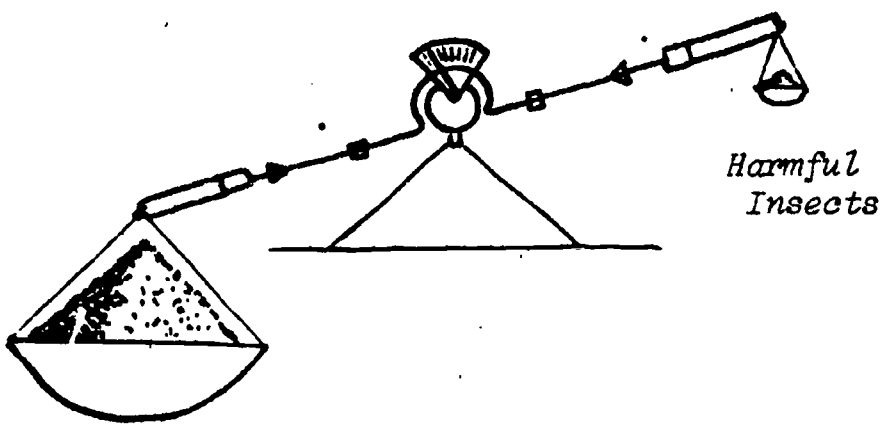
SUBJECT: Science

CONCEPT: The management of natural resources is value-oriented.

REFERENCE: Suggested by Susan Ahearn, Doctoral Student, Science Education, The Ohio State University.

ACTIVITY: Give this background information to your students:

There are more species of insects than there are species of all other kinds of animals. The harmful insects represent only 1/25 percent of all insects. There are about 235 species of insects that are known to be directly detrimental to man's existence. There are more than 1 million species of insects whose importance has yet to be determined. This concept can be easily illustrated in this way:



Other Insects

The teacher will make a sketch of the story which follows on the blackboard. All elements as described must be included.

Mr. and Mrs. Brown, who live on a farm, have invited some relatives over to their place for a picnic supper in their yard. The occasion is Mrs. Brown's birthday. It is summertime. The yard is a pleasant place to gather because there are several shade trees, some ornamental shrubbery and an apple orchard nearby. The Browns raise cattle, grow alfalfa and a variety of vegetables including tomatoes, beans and corn. All the guests are seated on lawn chairs near the picnic table. The table is prepared for the evening meal. Soon everyone will gather to feast on steaks, corn-on-the-cob, tomatoes, and beans. Mrs. Brown baked two apple pies and two peach pies that morning for dessert. A

vase of flowers has been placed on the table as a decoration. Aunt Betty is enjoying nibbling on some pecans from a dish beside her chair. Uncle Harry is smoking his pipe with a contented expression on his face. A birthday present has been placed on the table for Mrs. Brown to open after dinner. She is not aware that inside is a beautiful silk blouse. Mr. Brown is blowing his nose with a cotton handkerchief.

This scene is not unlike many scenes in our country today. However, let's imagine how the scene would be different if all harmful insects which usually are kept under control by natural insect predators suddenly grow out of control. The insect predators disappear for various reasons. The game described here will help to visualize the consequences more dramatically.

Divide the class into two teams. Team members are allowed to consult one another regarding all decisions to be made.

The teacher will need to prepare in advance a set of cards similar to those described and labeled as cards A, B and C. When everyone is ready to begin, place all cards face down so that the writing is not visible. Each child will have a chance to turn over one card and then another, in an attempt to match the cards. If no match occurs, the cards must be turned back to the original position. It is then the other team's turn. If the team member is able to make a match between two cards, he will then be allowed to select a "Bug Bomb" (BB) card and must make a decision as to whether or not the team will follow the directions on the matched cards or those on the BB card. BB cards suggest various activities for controlling insects. Sometimes the choices are not for the better, since both may be destructive. The object is to prevent the blackboard scene from disintegrating. The team that makes a choice that forces the last objects to be removed from the picture, leaving only the people, picnic table and the house, loses the game. If the team does not make a match within three tries, they must draw a Bug Bomb card anyway. Whenever a Bug Bomb is selected and read, it must be returned to the pile to be used over again.

The class should be encouraged to discuss their feelings during the time in which they had to decide on a course of action. What aspects of the picture were most important to maintaining its stability? What aspects of the game are likely to occur? What attitudes do your students feel toward insects in general? Can the students think of other ways in which beneficial insects are linked to man's future?

Here are sample cards for the teacher to make. Groups A and B must be exactly alike. Group C are the Bug Bomb cards. Can you or the students think up other pests and predators to include? Of what value are insects in the game as decomposers, pollinators, predators?

A and B

1. predator - green lacewing larvae
prey - alfalfa weevil grubs
type of damage - The grubs destroy alfalfa plants. There is no alfalfa forage for the cattle and fewer cattle for the Browns to raise, sell and eat. The cattle still can eat corn. Take away half of the steaks from the picnic table and erase the alfalfa field.

2. predator - Vidalia beetle (imported from abroad)
prey - scale insects
type of damage - The scales attack shrubbery and trees. They suck the sap from the plant, causing it to wilt. Control these with insecticides but do not remove anything from the picture.

3. predator - Parasitic wasp
prey - tobacco hornworm
damage - These hornworms have huge appetites for tobacco leaves. There has been an increase in problems with this pest in the South. Tobacco is now too expensive to buy. Uncle Henry gives up smoking. Take away his pipe.

4. predator - Parasitic wasps
prey - tomato hornworms
damage - These hornworms have huge appetites for tomato plants. The moth which develops from the hornworm feeds on the petunias in the garden. Mrs. Brown wants a roadside stand in which to sell tomatoes so she handpicks the caterpillars from the tomatoes. She only does this once and there are two generations per year. The second generation cut the tomato crop in half. Remove half of the tomatoes.

5. predator - Predatory mites
prey - a variety of pests on apple trees
damage - The orchard was sprayed at the wrong time and the mites were eliminated. The pests destroy the beauty of the fruit. People do not buy Mrs. Brown's apples. Remove the apple trees.

6. predator - Long-legged flies
prey - aphids on rose bushes, petunias and other flowers
damage - The aphids have sucked the juices from the plants. The irridescent green and gold tiny predator flies are destroyed when a neighbor destroys their marshy habitat by draining the water and planting crops. The rose bushes and flowers wilt. Remove them. The tomato hornworm adults (the moths) have nowhere to feed. Add the tomatoes.

7. predator - mites
prey - spider mites
damage - The spider mites suck juices from the leaves of the apple tree. Government regulations have restricted the use of most insecticides that control pests on apple trees. The trees are not sprayed this year. The leaves turn brown. Take away all apple trees.

8. predator - Parasitic wasps
prey - corn pests
damage - The community complains of mosquitoes biting everyone. They decide to spray the wet areas near Mr. Brown's cornfield. The insecticide kills the parasitic wasps which control the corn pests. Take away half of the corn crop.

9. predator - ground beetles
prey - soybean loopers
damage - The soybeans were sprayed last year. Ground beetles were able to survive on a variety of prey even though the loopers were gone. They roam freely over the ground in search of prey. Do not remove any beans.

10. predator - brown lacewings
prey - pests on pecans, peaches
damage - Pest damage to pecans could not be controlled solely by the lacewings and this has caused the price of pecans to skyrocket. Remove them. Peaches are protected usually by the lacewings but the population is not large enough.

A and B (continued)

11. predator - silky black ants
prey - aphids on alfalfa
damage - The aphids suck the juices from the plants. The ant colonies in the field are useful in controlling the aphids. Soil compaction of the mounds, from tractors, reduces the ant population. Forage for cattle is reduced. Remove all of the alfalfa and half of the steaks.

12. predator - silky black ants
prey - Mexican bean beetles
damage - The number of ant colonies in the bean field are fewer. Mr. Brown does not know this. He decides to reduce the applications of insecticides on the beans. The experiment was not very successful. Remove the beans.

13. predator - stink bugs
prey - cotton bollworm
damage - Cotton plants in the South were injured heavily by the bollworm. Insecticides for cotton have been highly regulated and the growers were unable to save much cotton. Take away Mr. Brown's handkerchief.

14. predator - Ladybug beetles
prey - bean aphids
damage - The aphids suck vital juices from the bean plants. The beetles are effective predators but prone to dispersing readily. The beetles are not present in large enough numbers. Remove the bean plants and the dish from the picnic table.

C - Bug Bomb Cards

1. The alfalfa crop has been treated with insecticide in early spring. Beneficial insects are destroyed as are the pests, but the crop is saved and is usable for cattle as forage. Don't remove anything.

2. The alfalfa crop was sprayed. The chemicals killed the weevils but also made the crop unusable for livestock to eat. Remove half of the steaks and all of the alfalfa.

3. A valuable predatory beetle has been imported from Australia to reduce the scale insects on shrubs and trees. Put back any trees or shrubs that have been taken away.

4. The beetles from Australia have been unable to gain a foothold in this county this year. Remove all shade trees and shrubs.

5. The tobacco growers are controlling the hornworms by fall plowing which exposes the pupae to the wind and weather. Give Uncle Henry a pipe.

6. The tobacco hornworms are sprayed but the beneficial insect predators are also destroyed. Tests show chemical residues on the plants are too high. The tobacco cannot be sold. Tobacco prices elsewhere rise. Uncle Harry gives up pipe smoking. Take away all pipes.

7. The tomato hornworm population is not held in check by the parasitic wasps. Remove all tomatoes from the picture.

8. Longshoremen on the docks refuse to unload cargo from the major silk-producing countries in Asia. Remove Mrs. Brown's birthday present.

9. A virus has de. royed America's silkworm indust . Remove Mrs. Brown's present.

10. The many apple trees have caused a number of apples to rot. The pomice flies which breed in decaying fruit are annoying to people. They are sprayed but other apple pest predators are also killed. Remove all apples and apple pies.

PURPOSE: To portray the dilemmas of implementing public policy in a society holding diverse values.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Science

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Richard A. Ellis, Research Associate, ERIC Science, Mathematics, and Environmental Education Analysis Center, Columbus, Ohio

The Little Tennessee River flows through one of the most scenic mountain and woodland areas of the eastern U.S. Clear unsilted coldwater stream supported good sport fishing. The Little Tennessee River lies within the Tennessee Valley. When the Tennessee Valley Authority was created in the late 1930s, to control floods which had ravaged the Tennessee Valley and to improve the standard of living in this terribly economically depressed region, it planned to build the Tellico Dam on the Little Tennessee River. Congress appropriated money for Tellico in 1947.

Because of delays, the Tellico Dam construction did not begin until 1967, much to the joy of many people living in the still-depressed vicinity of the dam. Anticipated were such benefits as a proposed planned community to be built with investments from a huge U.S. corporation in the western U.S., influx of industry, enhanced recreation opportunities, and an additional 200 million kilowatt hours of electricity per year of power generation (resulting from water to be diverted from Tellico reservoir to a nearby power-generating dam; Tellico Dam would have no generating capacity of its own). All this promised jobs and property for the area. Others, however, viewed the dam with dread. Farmers were forced to part with land which had been in their families, often for generations. Beautiful forests were cleared from land which would eventually be covered with water. Trout fishermen and those who had loved the escape of hiking and backpacking the area abhorred the prospect of the dam. All this took place before the advent of the environmental laws of the late 1960s and early 1970s.

Following passage of the National Environmental Policy Act in 1970, an environment group sued TVA to halt construction of Tellico Dam pending preparation of an environmental impact study. The courts granted this injunction. Further construction was delayed until 1973 while this analysis took place. TVA resumed construction because they believed the impact statement was complete and that the courts were in agreement In 1974, however, a professor at the University of Tennessee discovered a small minnow called the Snail Darter living in a short

stretch of the Little Tennessee River. The Endangered Species Act had become law in 1973. The Little Tennessee River was declared a critical habitat for the Snail Darter. In 1976, TVA was sued to stop construction of Tellico Dam under the Endangered Species Act. The U.S. Supreme Court supported a lower-court order to stop construction. Over $100 million had been spent on the dam. It was now illegal to take the few remaining steps to put it into operation by closing it and forming the reservoir.

Those interested in the economic benefits expected from the dam were outraged that a fish shorter than a person's thumb could wipe out an investment of over $100 million. "Of what value to people is this fish?" they argued. Congress had never intended such a ludicrous outcome, according to those favoring the dam. Environmentalists argued that the law must be scrupulously complied with. Man dare not continue to obliterate entire species, especially by development projects which also do significant harm to the environment in other ways. They pointed out that in the time that the controversy had delayed the dam, other information had become available and the claim that benefits of the dam would outweigh costs was now questionable. Also, the remaining Cherokee Indians in the U.S. had pointed out that the archaeological site of one of their capital towns, Chota, would be covered by the reservoir.

Pressure built for Congress to consider legislation specifically exempting Tellico Dam from the Endangered Species Act. The facts before Congress in 1979 were: (1) TVA had acted in compliance with its mandate and with the law, but had been reversed by a series of new laws reflecting changing environmental ethics. However, enormous resources had been invested; (2) the people of the region stood to lose much economic benefit; (3) the land had been cleared and much ecological damage done as a price of building the dam; these impacts were already irreversible; (4) some evidence showed that the Snail Darter might be reestablished by biologists in another river. On the other hand: (1) an entire species--unique and irreplaceable--could be destroyed; (2) a beautiful freeflowing river would be dammed; (3) an important archaeological site, a former capital of the Cherokee Indian Nation, would be inundated and lost forever; and (4) specific exemption to Tellico could jeopardize the effectiveness of the Endangered Species Act.

In October 1979, Congress decided to grant a specific exemption for the Tellico Dam, ordering it to be completed and closed.

What would you have decided?

PURPOSE: To illustrate the personal conflict that can exist in environmental decision-making.

LEVEL: Junior-Senior High School

SUBJECTS: Science
Social Science

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Robert J. Stahl. Valuing Exercises For The Environmental Education Classroom. Prepared under a Bingham Environmental Education Foundation Grant: Spring, 1976. ED 141 094.

NOTE: For more information, contact

Robert J. Stahl
Department of Secondary Education
Arizona State University
Tempe, Arizona 85281

ACTIVITY: Review with your students the fact that noise is threatening the physical and mental health of America's urban environment. Home appliances, city noises, industrial noises and entertainment are constantly increasing as a threat. According to the EPA an estimated 16 million people in the United States already suffer from some degree of hearing loss which could result in industrial injury and have a resulting economic consequence. The number of teenagers suffering from hearing loss has increased at an alarming rate due to loud amplification of popular music. Now, present each student with the following situation and ask for a response:

"Hear Ye! Hear Ye!"

The spring party is the biggest event of the year. Everyone goes to the party. Because poor bands have played in the past, most students are not planning to go to the dance at the end of the party. This year, however, the dance promises to be a special occasion. The Johnny Fischer Band, the best band in the area, will play at the dance.

You are to assume you are a student at Hontoon Jr. High School. Further, you are to assume you are student chairperson of the Spring Party Committee. With the help of several teachers and students, you have planned the entire event. You were the one who contacted the band. For your hard work you have been congratulated by the school's principal.

It is two weeks before the party and dance. At this time every detail has been checked and double-checked. Everything is "go"!

Today during second period you are called to the principal's office. He reports that he had just received a phone call.

"A group of students from the University have been doing some studies on the noise level of our community. At a dance last night, the music played by the Johnny Fischer Band reached a noise level of 116 decibels for long periods of time. As you know, this level is harmful to the human hearing system.

"When the university students informed the band members of the noise level, they laughed at them. In fact, the band played even louder.

"I'm not sure if I want this band to play at our dance. The music it plays is too loud. But it is too late to get another good band to take its place."

After a short conversation with you, he suggests that you, as the representative of the student body, should decide what ought to be done.

You are to return to your class, think about the situation, and report to the principal's office at the end of the period. You are to tell him your decision at that time.

As you try to reach your decision, you remember this:

-- after years of poor attendance at the dance, this year most students are eagerly awaiting the dance.

-- the Spring party and dance is the big event of the year especially for ninth graders who will leave the school in June.

-- many students worked hard to get the money to hold the party and to hire the band.

-- some teachers and parents opposed the dance because they don't like the type music played by the band.

-- music played too loudly can cause permanent damage to the ears.

-- you have been congratulated by everyone for your outstanding work and leadership.

-- to turn down the band would cause you to lose some of your friends.

-- it is too late to get another good band.

-- you are personally pleased with everything you have done, especially in getting the band.

The principal is waiting to hear your decision as to whether or not the band will play at the Spring Dance. You tell him...

After the students have had an appropriate amount of time to formulate their response to the principal, hold a class discussion to share the decisions reached.

The following questions might serve as discussion starters:

1. According to the principal, what damage is anticipated because of the loud music?

2. Which facts did you consider in making your decision?

3. What alternatives did you consider before making your decision?

4. What are the possible consequences of your decision?

5. Suppose you were also chairman of your school's Environmental Action Group. How might this position influence your decision in this situation?

6. At what point does music become noise?

7. How are music, noise and pollution related to each other?

8. When faced with making a decision to protect the things you enjoy or the things known to protect the environment, which is the more important?

9. When you were told you had to make this decision, what were your feelings?

PURPOSE: To describe some of the environmental and economic trade-offs involved in the use of pesticides in the forest.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Science

CONCEPT: The management of natural resources is value-oriented.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades 7 through 12. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Ask your students to read and respond to this hypothetical situation:

"Those insects have to be stopped before they destroy our entire forest," Bob Wilcox, president of the Freight Lumber Co., said. "They are killing nearly all of the trees and if we don't spray them soon with DDT our company will be without a continuing lumber supply--and that means the mill will close."

"I agree that you've got a problem," responded Chuck Davis, owner of Oldtown's largest salmon cannery. "But you can't use DDT. A few years back they used it up in New Brunswick on spruce budworm, the same bugs we've got, and it cut their annual salmon run down to about one-sixth of what it had been. If that happens here, my company would be wiped out --and so would all the jobs on the fishing boats."

"But DDT is the only pesticide that will do a quick and thorough job on those budworms," Wilcox argued. "I don't want to destroy your operation and kill all those fish, but I've got my own company, and all those trees to consider. If I don't spray I'll be ruined."

Hold a class discussion on these questions:

How well informed do Mr. Wilcox and Mr. Davis appear to be?
What can these people do to solve their problem? What are their choices?
It is possible that Mr. Wilcox does not have the choice to use DDT, given bans on its use in recent years.
What are the reasons for bans on use of DDT and bans and restrictions on use of other pesticides?
What pesticides are currently allowed, for what reasons, and under what conditions?
What possible positive and negative effects might result from use of specific pesticides you research?
What possible positive and negative effects might result from no use, attempting no chemical treatment of the problem?

How would you resolve the dilemma outlined in this hypothetical situation? What information do you need before making your decision? On what criteria would you base your judgment? What legal constraints must be considered? What alternatives are available which have not been discussed? Which of the alternatives seem most reasonable? Given sufficient information concerning this hypothetical situation, what solution seems most appropriate?

In their search for alternatives and solid criteria, encourage your students to consult the following references:

*Special Note on sources and dialogue: While the above dialogue represents a hypothetical situation, the data regarding the effects of DDT on salmon runs reflect the results of actual research. For a review of actual case histories see: Rudd, Robert L., *Pesticides and the Living Landscape* (Madison, Wisconsin: University of Wisconsin Press, 1966) pp. 106-109. The original research was reported by: Crowter, R. A., and E. H. Vernon, "Effects of Black-Headed Budworm Control on Salmon and Trout in British Columbia," *Canadian Fish Culture* No. 24:23-40 (1959); Keenleyside, M. H. "Effects of Spruce Budworm Control on Salmon and Other Fishes in New Brunswick," *Canadian Fish Culture* No. 24:17-21 (1959); Kerwill, C. J., "Effects of DDT Spraying in New Brunswick on Future Runs of Adult Salmon," *Atlantic Advocate* Vol. 48, No. 8, pp. 65-68 (1958).

Moreover, because of the considerable quantity of popular literature available on the effects of DDT (most of it less than objective in its presentation), only a highly selected list is given. Further information is extensively referenced in these documents:

Articles

Edwards, J. G., "One Step Beyond: An Inquiry Into Research On DDT." Available from the Terra Society, P.O. Box 110, Mt. Prospect, Illinois 60056.

Hinckley, A. D., "The Gypsy Moth, " *Environment* Vol. 14, No. 2 (March 1972), pp. 41-47.

McCaull, Julian, "Questions for an Old Friend," *Environment* Vol. 13, No. 6 (July/August 1971), pp. 2-9.

McIntire, Greg, "Spoiled By Success," *Environment* Vol. 14, No. 6 (July/August 1972), pp. 14-29.

Pamphlets

U.S. Forest Service, "Major Outbreaks of Douglas Fir Tussock Moth in Oregon and California," (Portland, Oregon: Pacific Northwest Forest and Range Experiment Station, 1973) General Technical Report PNW-5.

U.S. Forest Service, "Surveillance Report 1965 Burns Project Douglas Fir Tussock Moth Control," (Washington: G.P.O., 1968) S/N 994-184.

PURPOSE: To have students participate in a rank-ordering exercise to arrive at a group decision as to best and worst ways to reduce energy usage in a school situation.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Science

CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

REFERENCE: Robert J. Stahl. Valuing Exercises For The Environmental Education Classroom. Prepared under a Bingham Environmental Education Foundation Grant: Spring, 1976. ED 141 094.

NOTE: For more information, contact

Robert J. Stahl
Department of Secondary Education
Arizona State University
Tempe, Arizona 85281

ACTIVITY: Inform your students that they are to deal with a written situation, a rank-order decision sheet and with other decision sheets on which they are to identify good and bad policies.

Give each student the following situation:

"We're Running Out of 'Juice'"

Mrs. Yirga, principal of your school, has recently received information from the local school board. The board told her that little money will be available to pay electricity and fuel bills for the rest of the school year. According to the board, starting the following Monday, all schools were to take specific steps to reduce their energy use.

Instead of making the decision by herself, Mrs. Yirga announced she wanted the students at her school to help her make the important decision as to what things would be done to cut her school's energy use.

When you and your classmates came to school this morning, your teacher handed you a note from Mrs. Yirga. The note listed nine things Mrs. Yirga could do in order to cut down on the use of energy at the school. The nine things are:

1. all audio-visual equipment including films, filmstrips, overhead projectors and tape recorders can no longer be used.

2. air-conditioning in the classrooms can be turned off.

3. air-conditioning in the library can be turned off.

4. warm water only can be available for the showers in physical education.

5. all field trips can be cancelled.

6. use of school facilities such as the gym, library, etc., after 3:00 p.m. can be stopped.

7. the serving of hot and warm foods in the cafeteria can be severely reduced.

8. the reading center located in a portable classroom, which uses equipment, air-conditioning, and lights, can be closed down.

9. in case of colder weather, heaters can be turned on only on extremely cold mornings and turned off at 10:00 a.m.

Instead of doing all these things at once, Mrs. Yirga believes that only some of these steps are necessary to cut down on the school's use of energy. So, three of these policies will be enforced immediately and three are to be identified as the most important to keep. The remaining three policies will be enforced if and when the first three fail to cut down the use of energy by the school.

You and your classmates are asked to consider these steps. In general, you and your friends agree that some of these rules are necessary. At the same time, you know that all nine policies are not to be enforced immediately. You know that Mrs. Yirga is trying to enforce a school board policy and she could make her decision without asking your help. Your class is being asked to help decide which policies Mrs. Yirga should enforce right away and which policies she should postpone unless absolutely necessary.

In order to assist you and your classmates with your decision, Mrs. Yirga asks that you do three things:

1. to rank-order from best to worst the nine policies Mrs. Yirga has listed on the sheet;

2. to identify the three policies that should be enforced immediately and to state the reasons why these policies should be followed;

3. to identify the three policies that should not be enforced except in an extreme emergency and to state the reasons why these policies should be postponed at this time.

After the class has had an appropriate amount of time to read the situation, hold a discussion to help assure that students understand the context of the situation.

Now divide your class into groups of four or five students. Give each group the following three Decision Sheets and instruct them to come to decisions on all three to help Mrs. Yirga. (Make sure students understand Rank-Ordering.)

Decision Sheet No. 1

Rank-order Decision Sheet

Directions: Rank-order the following policies from those you are most willing to accept to those you are least willing to accept. To do this, place a "1" by the policy you most want accepted; a "2" by the policy you want accepted next; and so on until you have placed a "9" by the policy you hope never gets accepted.

_____ all audio-visual equipment including film, filmstrips, overhead projectors and tape recorders will no longer be used.

_____ air-conditioning in the classrooms will be turned off.

_____ air-conditioning in the library will be turned off.

_____ warm water only will be available for the showers in physical education.

_____ all field trips will be cancelled.

_____ use of school facilities such as the gym, library, etc., after 3:00 p.m. will be stopped.

_____ the serving of hot and warm foods in the cafeteria will be severely reduced.

_____ the reading center located in a portable classroom which uses equipment, air-conditioning, and lights, will be closed down.

_____ in case of colder weather, heaters will be turned on only on extremely cold mornings and turned off at 10:00 a.m.

Decision Sheet No. 2

The Three Policies to be Enforced

The three policies to be enforced are:

1. _____

_____

2. _____

_____

3. _____

_____

Our reasons for believing that these three things should be given up first are:

_____

_____

_____

_____

_____

Members of the group who made this decision are:

_____

_____

_____

_____

_____

Decision Sheet No. 3

The Worst Policies to be Postponed

The three policies that are not to be enforced unless absolutely necessary are:

1. _____

_____

2. _____

_____

3. _____

_____

Our reasons for believing these three things should be preserved are:

_____

_____

_____

_____

Persons participating in making this decision are:

_____

_____

_____

_____

_____

After the groups have completed the three Decision Sheets, hold a class discussion to compare and contrast the decisions among groups.

The following questions might serve as discussion starters:

1. What policy did the school board expect Mrs. Yirga to follow?

2. What caused the school board to pass such a policy?

3. How are the policies you were asked to consider related to problems of energy use?

4. What is the relationship between energy use and environmental protection?

5. What other ways of conserving energy might Mrs. Yirga consider?

6. Is it fair for the school board to place the burden of the decision on principals like Mrs. Yirga?

7. If Mrs. Yirga had made the decisions by herself, what would be your feelings toward her?

8. If your own local school board really began cutting energy use at your school, would you be upset?

PURPOSE: To help students realize that environmental issues often force people to make choices and that all people do not agree on which choices are appropriate.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Science

CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

REFERENCE: Robert J. Stahl. Valuing Exercises For The Environmental Education Classroom. Prepared under a Bingham Environmental Education Foundation Grant: Spring, 1976. ED 141 094.

NOTE: For more information, contact

Robert J. Stahl
Department of Secondary Education
Arizona State University
Tempe, Arizona 85281

ACTIVITY: Divide your class into groups of four or five students. Give each group the following situation:

"Eeny, Meeny, Miny, Moe, ..."

The end of the year was fast approaching. The city manager of your city announced that there would be a sizeable sum of money left over at the end of the year. However, according to state law, all monies left unspent have to be returned to the State Treasury.

You are a member of the city council. You have long hoped for extra money to be available to spend. For years you have sought support for three of your pet projects. In fact, just last year the city council voted to spend any extra money for your projects. Now it appears your three projects will be funded. You have wanted the money to:

-- build bike paths to protect young bicyclists;
-- build and operate a park and small animal zoo; and
-- purchase a large piece of land as a natural wildlife refuge.

This evening the city council is meeting for the last time this year. The decision to spend the money must be made tonight.

You have already reminded the council members of their vote twelve months ago to fund your three projects when the money was available. It appears the money is now available.

As the city manager begins the meeting, your dreams are shattered. Only one-third of the money that was thought to be available was still left unspent. Of your three projects, only one can be funded. The council members inform you that they can and will spend the money on one of your projects. It is your choice. However, they cannot promise or guarantee that extra money will be available next year or the next. To delay your decision would force them to fund other projects proposed by other members of the council.

In other words, if you decide not to make a choice, you will get none of your projects funded. Should you decide on one of the three, you never get your other two projects funded. The council members agree that you must choose from the three projects you have long supported. You must choose one of the following:

-- to build the bike paths.
-- to build and operate a city park and small animal zoo.
-- to purchase land for a natural wildlife refuge.

After each group has had a chance to read the situation, discuss it to assure initial understanding of the context.

Now, instruct each group that they, as a group, are to make a choice and come to a decision. Distribute the following decision sheet to each group to record their answers.

Decision Sheet

Directions: Members of your group are to agree on one of the three options offered to you as a Council member. You should seek some basis for agreement. This means that you are not to vote. Instead you must reach a common conclusion that all members of your group are willing to accept and support.

The three possible projects that could be funded by the Council are:

1. _____

2. _____

3. _____

Of these three projects, the best project is:

_____

If asked to provide our (my) grounds for making this decision, we (I) would say:

_____

_____

_____

_____

The person(s) responsible for making this decision are:

_____

_____

_____

_____

_____

After the decision sheets are completed, hold a class discussion to compare and contrast the various group decisions. The following questions might help to serve as discussion starters:

1. Remembering that bicycle paths would lead some motorists to stop driving to work, which of the three projects would be the most protective of the environment?

2. How might one associate the concept of conservation to the wildlife refuge project? the small animal zoo project? the bike path project?

3. Which project would reflect the 'wisest' use of the money available to spend?

4. Is it bad that projects such as those listed were not already funded by the City Council?

5. What projects that operate to preserve and protect the environment are already supported by your city's government?

6. The building of roads and parking lots have been condemned by many environmentalists. Would an environmentalist who worked against the building of roads support the "bike path project"?

PURPOSE: To encourage students to consider ways everyday choices reflect lifestyles and values.

LEVEL: Junior-Senior High School

SUBJECTS: Science
Social Studies
Mathematics

CONCEPT: Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades 7 through 12. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Duplicate this questionnaire, or develop your own, and distribute it to your students:

Given the choice, which would you prefer?

• Formica with simulated wood grain	polished solid wood
• Metal sculpture	wood carving
• Plastic toys	wooden toys
• Metal kitchen cupboards	wood kitchen cabinets
• Artificial logs with gas flame	fireplace wood
• Gas burner stove	camp cooking or wood fires
• Aluminum canoe	laminated wood canoe
• Fiberglass-hulled boat	wood-hulled boat
• China bowl	wood salad bowl
• Aluminum ladder	wood ladder
• Chain-link fence	wood-slat fence
• Cement patio	wood decking
• Aluminum outdoor furniture	redwood furniture
• Plaster walls	wood-paneled walls
• Stucco siding	shake shingle siding
• Glass bottle (returnable)	paperboard carton
• Glass bottle (recyclable)	paperboard carton
• Glass bottle (nonreturnable)	paperboard carton
• Metal clothes hangers	wood clothes hangers
• Metal baseball bat	wood baseball bat
• Plastic picture frames	wood picture frames
• Wall-to-wall carpeting	wood floors
• Plastic Christmas tree	a living coniferous Christmas tree
• Aluminum Christmas tree	cut coniferous Christmas tree
• Paper towel	cloth dish towel
• Paper cup	plastic cup

After the students have completed the questionnaires, encourage them to discuss their responses. Explore the feelings, ideas and information they feel affected their selections. Discuss questions such as the following:

What factors influenced your choices?

Did the way in which you planned to use the item influence your decision? Did the item's price influence your choice? Its aesthetics? Its durability or performance?

Can you identify any trends shown by your choices?

Then ask your students to find out (1) how much energy is required to manufacture and use one of the products or materials they chose; (2) the relative environmental impact of its manufacture and use; (3) the comparative retail price of each item; (4) its renewability, reusability, and recyclability; and (5) the impact of the item's manufacture and use on the nation's economy.

Follow these investigations with a discussion to include questions such as the following:

How does information related to the energy requirements and environmental impact influence your preference?

On reflection, did you consider these factors when you made your decision?

Would the other item, if you had chosen it, have more or less impact on the environment? On energy consumption? On the economy?

What trade-offs, if any, are involved in the selection of such products?

Which items, if any, do you need to survive? Which could easily be eliminated?

How do your choices reflect your lifestyle and values?

PURPOSE: To consider consequences of the Big Thompson Flood and rank alternatives for a post-flood land-use policy.

LEVEL: Junior-Senior High School

SUBJECT: Social Studies

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Karen Hollweg. Unit on The Big Thompson Flood and Flood-Related Land-Use Policy Jefferson County Public Schools, 1209 Quail Street, Lakewood, CO 80215.

ACTIVITY: The following activity was adopted from the unit of study cited above. More detailed information can be obtained from the author.

Make the following facts and figures available to your students:

Facts and Figures About the Big Thompson Flood

Occurred the night of July 31, 1976.

Was a "500-year flood."

Where: Big Thompson Canyon and North Fork (refer to a map).

Cause: Approximately 5 hours of extremely heavy rain, amounting to about 10-12" in 3 places around Estes Park.

People affected:
- 139 dead
- 9 missing
- 179 injured
- 17 hospitalized
- 3,500 given food, clothing and immediate "mass care"
- 400 sheltered at 3 Red Cross stations (many others sheltered in private residences or buildings)
- 325 families given long-term assistance (temporary housing, furnishings, home repair, medical aid, occupational supplies, etc.)

Property damage:
- 400 homes destroyed or sustained major damage
- 111 mobile homes destroyed or sustained major damage
- 52 small businesses destroyed or sustained major damage

Discuss the expense to not only the families in the area but to other taxpayers in terms of higher insurance rates, federal and

state costs (Red Cross, rebuilding roads and bridges, law enforcement personnel), donations of money, food and lodging by private citizens and companies. Also mention that some geologists believe a similar flood could occur again in this area.

Now, present the following Federal Law to your class:

FLOOD DISASTER PROTECTION ACT, PL 93-234, 1973

--flood insurance is required by any public or private property owner wishing to use loans or grants from federal agencies or federally regulated lending institutions to buy, build, or improve buildings on land subject to flooding.

--National Flood Insurance can only be purchased when the community has regulations on future development in flood-prone areas.

Discuss what this law means to the 182 families on the Big Thompson River. Although these people own the land and pay taxes on it, they cannot rebuild on it or live on it because it is on a floodplain.

-- The government requires a floodplain study
-- The government subsidizes the study and the insurance companies that carry flood insurance
-- The insurance companies will not sell insurance for houses in floodways
-- People cannot get money to build without insurance

To better illustrate the conflicts surrounding the flood, introduce your students to the following for characters affected by the flood. (These are composite personalities based on concerns and opinions expressed by people in the flood area in May, 1977.) You may wish to have your students role-play these characters.

Ray Burke--My home is in Waltonia. I operate a rock shop, selling rocks and collectibles to tourists, in the front of my house. Our house was over 50 percent damaged, so the government won't let me repair it. Without my shop, I can't earn a living. My business depends on the canyon tourists, so I need to live and work there, not down in Loveland. I should be allowed to repair my shop and home so my family has a place to live and I can earn a living --everyone has the right to do that--it's the American Way! If the government keeps me from doing that, I'll have to apply for welfare and that's no good.

Ethyl Westerback--I first came to the canyon on my honeymoon. We've come here for vacations ever since. We love the canyon--it's so cool in the summer, we like fishing,

and the sound of running water is so pleasant. Four years ago, when George retired, we bought a house here in Drake. Drake is such a nice, neighborly community. We have so many dear friends--even though we lost the Schmidts in the flood. And now they're trying to strip us of our property rights--say we can't build a new house on our land! We own the land and if we want to build there and drown it's our right to! It was a freak storm, anyway, and it'll never happen again in my lifetime.

Bonnie Forbes--I'm an official in the Larimer County planning office. We feel it's government's role to guard people against tragedies and to help them should a catastrophe happen. Our government officials have been doing an outstanding job since before the flood. A highway patrolman and a policeman lost their lives trying to evacuate people from the canyon. We were able to keep looting and post-flood harm to a minimum by closing the canyon right after the flood and guarding access. The temporary road was in by October. (It will be totally re-built and flood-proofed soon.) But we cannot allow people to re-build in the floodplain. That would put us right back where we were before the flood--with many extremely hazardously-located houses. In the meantime, we are doing our best to apply for HUD ($2.6 million) and state monies to help residents re-locate and rehabilitate themselves.

Joe Jackson--I feel sorry for the canyon residents and all the hardships they've had to endure, but frankly, I wouldn't live there--it's dumb. Everyone here in Loveland has helped in one way or another with the disaster care, donating the Innerfaith Council's efforts, and so forth--and that's fine. But I don't want to have to pay even higher taxes on my farm here to pay for the county to build bridges and roads into all those little private bunches of vacation homes in the canyon and pay those people for their river-bottom property, relocation, or whatever. They'll have to pay that themselves and just start over. Hopefully they've learned a lesson and won't buy property in the floodway again. But I won't pay more taxes for their mistakes!

Ask each student to rank the four, giving a #1 to the person they feel is most appropriate in his/her opinions...the one they think most highly of, and a #4 to the one they think is least appropriate.

As students do their individual ranking, make a chart around your list of names:

	1	2	3	4
Ray				
Ethyl				
Bonnie				
Joe				

Ask students to "vote" with all students who ranked Ray #1 raising their hands. Record total on chart. Then ask how many rated Ray #2 and record. Continue until all squares are filled.

Summarize by noting the diverse judgments and variety of values represented in the class. Hopefully students will continue to consider the values of these four and their own values as they learn more about the flood and as they look at many alternatives that could be used in resolving flood problems.

PURPOSE: To identify the trade-offs required to substitute a material derived from a nonrenewable resource for a material derived from a renewable resource.

LEVEL: Junior-Senior High School

SUBJECT: Social Studies

CONCEPT: Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades 7 through 12. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Wood has been abandoned for certain uses and replaced by materials developed by modern technology. Many of the replacements are made from materials derived wholly or predominantly from nonrenewable natural resources, such as plastics from petroleum. This activity explores the advantages and disadvantages of the substitutions.

Help your class brainstorm a list of items which once were usually made from wood and now are usually made from a nonrenewable raw material. Some examples are:

- Metal and plastic furniture for wood furniture
- Plastic bags for paper sacks
- Steel beams for wood beams
- Asphalt floor covering for wood floors
- Metal barrels for wood kegs or casks

Use the list as a starting point for discussing questions like these:

Why were the substitutions made?
What trade-offs were made when the substitution took place?
What are the implications if nonrenewable materials become scarce or too expensive and wood is used again? How might society's energy requirements be affected? What impact would the increased demand for wood have on the other uses and values of our forests? How would employment be affected in wood and nonwood industries?
What renewable materials are more suitable for reuse or recycling than some nonrenewable materials? What nonrenewable materials are more suitable for reuse or recycling than some renewable materials? Is any such recycling going on? What problems are involved in any such recycling?
Would you accept wood or wood products now for any of the items listed? Which ones and why?
In buying and using products derived from natural resources, try to select those that seem to make most effective use of our natural resources.

PURPOSE: To illustrate value conflicts that might occur within a community due to land-use decisions.

LEVEL: Junior-Senior High School

SUBJECT: Social Studies

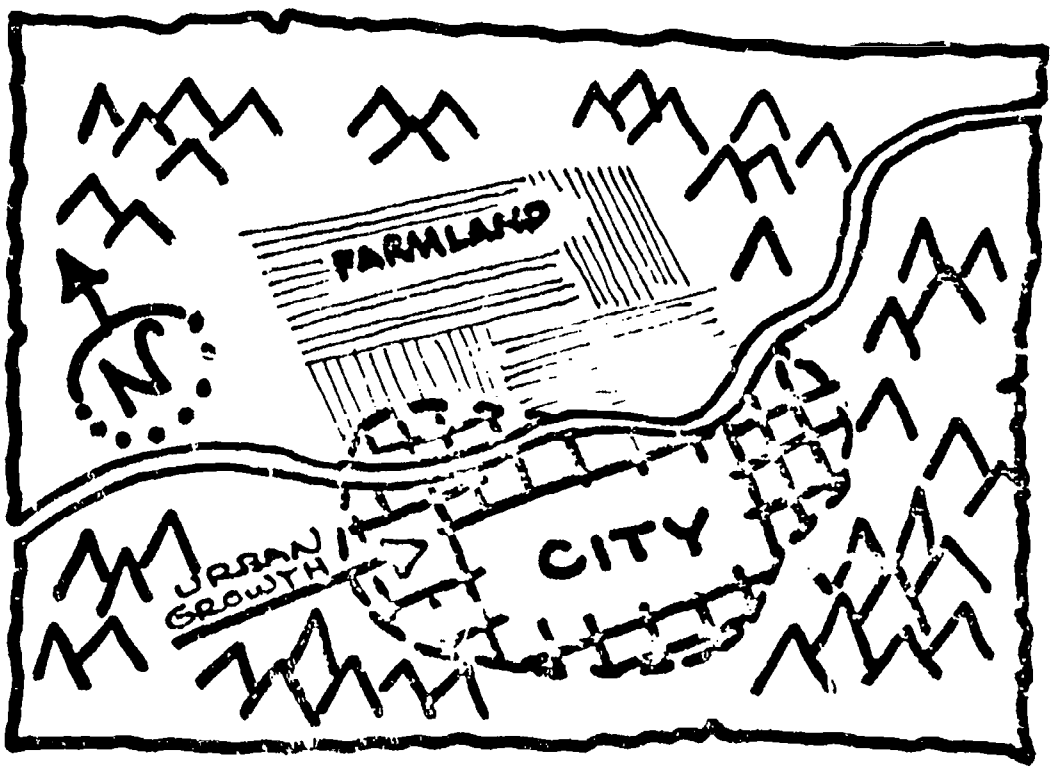
CONCEPT: Choices between needs (essentials) and wants or desires (non-essentials) may come into conflict more frequently as humankind's population and consumption levels rise within finite resource limits.

REFERENCE: Teacher's Resource Guide for Environmental Education. Arizona Department of Education, 1535 W. Jefferson, Phoenix, Arizona, 1976. ED 148 594.

ACTIVITY: Give each student the following hypothetical situation:

The town of Cruz Bend lies in an area which has for years been the agricultural center of the state. The population of the city is 100,000 and is rapidly increasing. There is pressure to expand the city limits north to allow the city to grow. In the area of growth, much of the land is farmland; i.e., cotton, pecans, and pasture.

There is a demand by various segments of the community to rezone 1000 acres of this land for housing so as to provide for new residents and thus ease housing problems for the city. The Cruz river runs near the area and provides for the city's water supply and as a source of irrigation water. See the map of the area below.



Geography--The city lies in a desert valley with mountains to the south, east, and west. The farmland is slightly sloping and lies at the foot of steep mountains which have a history of heavy rainfall during the summer months. There is little vegetation on any of the slopes. Water, while being supplied by the river, is being supplemented by wells. In the future, it is expected that most of the city's water will have to be pumped from underground. The soil is basically alluvial in origin.

Economy--Farming, while being the historical foundation of the city's economy, is becoming less of a factor today. Industries such as aircraft and electronics have become important, as is solar energy.

Society--The community seems to favor growth. There is a strong agricultural force in the city. There is a movement within the community for the preservation of the scenic beauty of the region and this group generally opposes the development of the area for homes or industry.

You are members of the community and you are to attend a city council meeting to decide if the rezoning is to occur. First, decide what land uses could occur on the land. Develop various categories of uses and then break the class into groups with each group selecting one area of use. Have each group then develop a plan of action and a presentation to be made to the city council. Have the groups develop either maps, drawings, charts, or graphs supporting their proposal. Try to obtain group sizes of 5 to 7 (this would make about 5 or 6 groups for a 30-student class). Try to get an uneven number of groups; i.e., 5, 7, 9, etc. Once groups have been selected, have one student from each group be appointed to the city council. Have the council then get together and decide how it is going to operate the upcoming meeting. Have the council develop how it is going to evaluate each group's proposal. Then conduct the meeting, allowing each group 10 minutes to make their presentation. Allow for questions from the council and from the floor. Once completed, have the council go into recess and then reconvene and give its decision as well as its reasons for the decision.

Discuss the following questions:

-- Is it easy to decide what to do?
-- What information do you wish you had to make a better case or decision?

PURPOSE: To cite an example of how something in our environment can affect our lifestyle.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Language Arts

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

ACTIVITY: Share with your students the following quotation by Winston Churchill:

> "We shape our buildings and afterwards our buildings shape us."

Ask each student to write a statement that attempts to explain the quotation. Inform them to be specific in terms of lifestyles. For example: We build high-rise apartment buildings that can house great numbers of people in a relatively small area of land. What adjustments do the residents need to make in terms of recreation, privacy, security, etc. How does this building shape affect the way these people live?

They may wish to include in their statements an example of a local building shape and the shape of a building in another country with a different type of culture. As a conclusion to their statement, ask them to design and/or describe a building they believe that would have a good effect on their lives in the future and to explain their reasoning.

PURPOSE: To provide students with the opportunity to develop logical support and defend their espoused values.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Language Arts

CONCEPT: Man's decisions are a result of his values which may in turn result in personal responsibilities.

REFERENCE: Suggested by David L. Hanselman, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: Discuss with students that often when we form a belief and express it with others, we need to be able to support and defend our positions. To do this successfully, we need to clearly express our beliefs and back them up with supporting evidence.

Present the following situations to your students and ask them to respond and defend their positions:

Someone says to you: "I can afford it. That's why I drive a big car with air conditioning."
And you reply: "....."

The editorial in the paper says: "Trees are more valuable standing than converted into lumber. We should develop a national policy to use only recycled fibre for paper and use lumber only when absolutely necessary."
And you write a letter to the editor stating: "....."

A close friend laments, "There's just no chance. People are basically greedy, politicians are dishonest and the giant corporations aren't about to clean up their deadly pollution."
And you share your feelings: "....."

PURPOSE: To help students to recognize techniques of propaganda and persuasion used in the mass media.

LEVEL: Junior-Senior High School

SUBJECTS: Language Arts
Social Studies

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades 7 through 12. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Give this background information to your students:

You live in Woodsville, a medium-size community where logging and related occupations are one of the major industries. The West Lumber Co. has announced that timber on the state-owned Dennis Tract will be cut in a few weeks. The cutting method will be "group selection," a process in which all trees (for example, three or four trees) in a small area are removed. The management goal is a sustained yield of timber from the area.

The Dennis Tract is not the only large forested area near Woodsville, but it is the closest and most accessible. It is used by many picnickers, hunters, school study groups, fishermen, and others each year. Because of the energy shortage, this recreational use is expected to increase.

West Lumber Co., which purchased the timber from the state, has agreed to several conditions in response to concerns expressed by the community. It promises to leave certain choice areas untouched and to provide access to them; to conduct logging operations in a way which will minimize aesthetic damage during harvest, and to reforest as soon as possible after logging.

Public opinion is divided in Woodsville. Timber industry employees favor the logging plan. The Board of Education is not sure which is of more value, the natural area for study or the state funds they will receive as revenue from the logging operation. Some sports and wildlife interest groups favor the plan because it may increase the population of certain animals, particularly large game animals such as deer. Other sports, wildlife, and nature study organizations oppose the logging. They believe the site has more value as a natural area and are worried that logging and road-building will harm some wildlife, especially fish, and also the water quality of the streams.

The company's position is that it has met all the legal requirements stipulated in its sales contract and, moreover, has made additional efforts to protect values the community considers important. It plans to go ahead with logging operations but a local citizens' coalition still hopes to be able to prevent the harvest.

Ask students to assume the roles of local editorial researchers on the *Woodsville World*. Their managing editor has not decided which position the respected and influential newspaper should support on this issue. The editor has asked staff members to write two editorials, one for and one against the West Lumber Co. plans.

Students should write their editorials to make them as convincing as possible. They may use freely any value-laden words or phrases which they believe will contribute to the effectiveness of their argument. Other propaganda techniques, such as stating some facts and ignoring others, may be used but students may not say anything which is untrue. Researching factual data should be encouraged.

After the editorials are completed, share them in class to determine how choice of words, selection of facts, and other techniques were used to build a case for one viewpoint or another. Then discuss:

- Did the value-laden words or phrases tend to clarify or cloud the issue?
- Did you notice any obvious omissions of significant facts in any of the most effective editorials? What were they?
- Have you recognized any of the opinion-molding techniques you used also being used by the local media in newspaper, radio, or television editorials?

You might extend this activity by asking students to investigate regulations affecting logging practices. Regulations can exist at both national and local levels. Through research including contact with experts representing diverse points of view related to forest management, investigate and discuss issues related to the following questions:

- Given the base of information you have established in this hypothetical situation, if you lived in Woodsville, would you support the West Lumber Co. or the citizens' coalition? Might your position be different if you lived somewhere else? Describe the bases for your response to each question.
- Would you have a different opinion if the company owned the land instead of the state? Why or why not? How would your opinion change?
- Are there other alternatives available for the Dennis Tract besides logging or not logging? If so, how might the community conflict be resolved to the satisfaction of the company, the coalition, and the entire community?

How might this conflict be resolved most reasonably to the maximum long-term benefit for all involved, including wildlife, vegetation, other natural resources, and human interests?

What implications of the problem might there be for people living in other places in the United States? In other parts of the world?

PURPOSE: To investigate why student attitudes toward natural resources might differ from the attitudes of pioneer settlers.

LEVEL: Junior-Senior High School

SUBJECTS: Social Studies
Language Arts

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

REFERENCE: Project Learning Tree. Supplementary Curriculum Guide for Grades 7 through 12. Copyright 1977 by American Forest Institute. Reprinted with permission of AFI.

ACTIVITY: Many historical accounts of American conservation practices talk about the "unspoiled continent which was invaded by greedy exploiters who ravaged this virgin land."

It is likely that neither the pioneer resource developers nor their successors saw themselves as unthinking spoilers; they were not regarded as such by most of their contemporaries. Instead, the early settlers tended to act in ways consistent with their environmental circumstances and their intellectual heritage. When our forests seemed limitless, the "cut-out-and-get-out" approach to logging may have seemed a necessary or appropriate response.

Students can attempt to understand why the early settlers acted as they did toward their environment. This activity explores the rationale behind the pioneers' behavior.

Ask your students in small groups to assume the roles of members of pioneer families moving from Philadelphia to the Ohio frontier in the 1780s. The frontier land is covered with dense, deciduous hardwood forests. Wildlife abounds, including bear, deer, bobcat, quail, grouse, passenger pigeon, wolf, and cougar. There is a resident population of Indians, but the settlers have little contact with them.

Each family has brought along vegetable and grain seeds and its livestock, consisting of a milk cow, two pigs, two sheep, a horse, an ox, and ten chickens.

Ask the "families" to make lists of the things they must do in order to establish a home in this wilderness. These tasks should be listed in the order the families plan to accomplish them. For instance, "provide food" might be first and "provide shelter" second.

Then each family should discuss and make a second list describing the environmental impact they could anticipate resulting from each activity. For example, providing food and

shelter probably would involve shooting wild game and cutting trees and clearing ground for a cabin and garden.

After the lists are complete, you and the students might discuss:

- In your role as a pioneer, how would you describe your attitudes toward the forest when you began establishing your homestead?
- What impact would you have been likely to think you were making on the environment?
- How does your present attitude toward the forest as a natural resource compare to the attitude you held when you imagined yourself an early settler?
- What factors do you think have contributed to changes in Americans' attitudes toward the environment since the 1780s?
- Is it appropriate to condemn the pioneers and early industrialists for exploiting the environment? Why or why not?
- Do you believe the practices, policies, and traditions of the past are representative of the present behavior of people and industry? Why or why not?
- How can we more effectively judge our actions affecting the environment by current standards and conditions as well as by the needs of future generations? State your reasoning.

Now, ask students to read Walt Whitman's poem, "Song of a Redwood." In this poem, Whitman explores an ethical conflict: admiration for the pioneer spirit which conquered land to develop the West vs. love of nature and the beauty and majesty of a great tree.

Ask the students to identify value statements and pick out words used to express attitudes in the poem. List these phrases and words on the blackboard in two categories: one for those which convey their values through connotation; the second for those which convey their values through their denotative meaning. Some phrases and words may fit in both categories.

Discuss these and other questions:

- Which phrases or words seem to be most effective in communicating their values?
- What ethical (value) systems are communicated in the poem? Which system do you think Whitman favors?
- Have conditions changed since the poem was written? Would your recognition of these changes alter your opinion of the pioneers?
- Could some opposing values be present within the same person? If so, how? Give examples.

PURPOSE: To compare and contrast concepts of wilderness expressed by people from two different cultures.

LEVEL: Junior-Senior High School

SUBJECTS: Language Arts
Social Studies

CONCEPT: Individuals perceive different self roles depending upon their values and their environment.

ACTIVITY: Ask your students to write a short paragraph describing their concept of wilderness; i.e., what do you think of when you think of wilderness? Suggest that they use as many descriptive adjectives as possible. After they have completed this task, ask students to share their paragraphs with the rest of the class.

Next, look up the word wilderness in a dictionary and hold a discussion to compare the dictionary definition of wilderness with various student concepts.

Now, share with your class the following words spoken by Chief Standing Bear of the Sioux Indians in 1865 in the Dakota Territory:

> We do not think of the great open plains, the beautiful rolling hills, and the winding streams as being wild. Only to the White Man was nature a wilderness and only to him was the land infested with wild animals and savage people. Not until the hairy man from the East came and with brutal frenzy heaped injustices upon us and the families we loved was it wild for us. Not until the very animals of the forest began fleeing from the approach of the White Man did the West become savage and cruel.

Compare and contrast students' responses, the dictionary definition and Chief Standing Bear's statement. Were there differences? What values account for these differences?

PURPOSE: To analyze the values that were operating among youth by tracing and comparing the types of music and dance that have had popularity during the 1900s.

LEVEL: Junior-Senior High School

SUBJECTS: Fine Arts
Social Studies

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

ACTIVITY: Discuss with your class that approximately every five years a different style of music and dancing becomes very popular with youth. Current values and issues are often reflected through those different styles. For example, youth in their early twenties during the depression and prohibition in the late 1920s and early 1930s engaged in the Charleston ... a type of dance and music that implied an extremely carefree, reckless and resentful attitude toward the times. It seemed as though youth were deliberately trying to shock the adult world and shock them they did! This reaction on both parties is not unique to the depression years. Youth through popular lifestyles including music, dance, dress, hair styles and peer activities have often struggled to show their independence from the adult world and "adult world problems."

Ask your class to describe the type music and dance that is popular today. Why do they like it? Do their parents like it? Why? Why not?

Have students interview their parents and grandparents to obtain descriptions of the type of music and dance that was popular when they were of high school age and as to whether the adults approved. Is there a relationship to the events that were taking place in the country at that time? What values were operating in each case?

Values Activities In Environmental Education

Senior High School

PURPOSE: To examine trade-offs involved in the choice of an energy source in a hypotehtical situation.

LEVEL: Senior High School

SUBJECTS: Science
Social Studies

CONCEPT: The management of natural resources is value oriented.

REFERENCE: Teacher's Resource Guide for Environmental Education. Arizona Department of Education, 1535 W. Jefferson, Phoenix, Arizona, 1976. ED 148 594.

ACTIVITY: Present this situation to your students:

Some time ago, Inter State Paper Company officials, in order to comply with new air and water pollution regulations, hired pollution-control technicians to study the company's manufacturing operation. The technicians now have presented a pollution-reduction plan to Inter State's board of directors. The new process would reduce odorous gas emissions (air pollution) by 95 percent and the B.O.D. (a measure of water pollution) added to the river by 94 percent. The control measures would cost an estimated $11 million to $12 million but, with some state assistance, the company will be able to install the new process within a few years.

The new process would have the additional benefit of enabling the company to recover and reuse or sell most of the waste products now dumped into the river and air.

There is one problem. The new process would require substantial amounts of electricity. The power can be obtained from a coal-fired plant that would have to be constructed. This plant also would require pollution-control devices but it would have the advantage of generating enough new electricity to meet the increasing energy needs of the community as well as those of the paper plant. Coal for the plant most likely would come from strip mining but this issue will be decided by pending federal legislation.

Inter State has proposed an alternative to the coal-fired plant. The company believes it can supply the additional electricity needed by installing a wood and wood-waste fired boiler in its plant. Drawbacks are that this boiler would cost three times as much as one using only coal or gas and it would not produce any excess power for the community. Inter State would have to raise prices for its products to get the necessary funds and the community's energy needs would not be met.

After students have familiarized themselves with the situation, discuss these questions:

1. What are the advantages and disadvantages of Inter State producing its own energy?

2. What are the advantages and disadvantages of a new coal-fired power plant?

3. If the company installs its own boiler and then raises its paper prices, what effect might there be on sales? Would you be willing to pay more for your paper? Would you be willing to use less?

4. What implications does the choice of a power source have on the future of the company and of the community?

5. What are the trade-offs involved in this situation?

6. What options are available to the community?

7. If you lived in this community, which option would you choose? Why?

PURPOSE: To illustrate environmental problems that can occur as a result of conflicting values held by special interest groups.

LEVEL: Senior High School

SUBJECTS: Science
Social Studies

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

ACTIVITY: Briefly summarize to your class the controversy regarding the use of off-road motor vehicles in the California desert.

-- The land is owned by the Bureau of Land Management. In other words, it belongs to all of the people in the United States.

-- The desert ecosystem has rare and beautiful vegetation that is easily damaged and does not recover quickly.

-- There are also unique Indian engravings or intaglios in the area.

-- Various groups of people differ in how the use of this land should be regulated by the government, including:

1) Owners of off-road vehicles such as trail bikes and dune buggies find this area an exciting place to explore on their vehicles. They constitute approximately 10 percent of the population in the U.S.

2) Hikers, backpackers, ecologists and archeologists are concerned about the damage to the vegetation and to the ancient intaglios that has already occurred by the ORV's. They fear the area will be completely destroyed for their use if the government does not prohibit ORV's.

3) Homeowners protest the noise, dust and litter created by the ORV's. The nature enthusiasts also complain about these disturbances.

Survey your class in regard to their opinions about regulating the use of this public land. What should the government do? You may wish to extend this activity to include a class debate between opposing sides after each side has had an opportunity to research the controversy.

PURPOSE: To participate in a simulation to demonstrate that special interest groups can have conflicting values.

LEVEL: Senior High School

SUBJECTS: Science
Social Studies

CONCEPT: Individuals perceive different self-roles depending upon their values and their environment.

REFERENCE: Paul Mehne, Doctoral Candidate, 1973, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: Inform your students that they are going to participate in a simulation entitled Hunter's Choice which deals specifically with deer populations. There is some question, and debate, concerning whether or not to allow a "hunter's choice" season in an attempt to reduce the size of the state's deer herd.

In this simulation, each student will assume the role of a member of one of seven interest groups using their "influence" to produce changes in natural resource policy in the State of York. Each interest group has an equal amount of influence to utilize. The interest groups are: Sportsmen, Farmers, Non-farming Landowners, Legislature, Wildlife Council, Wildlife Biologists, and a Natural Resources Administration Staff.

Some possible goals of the various interest groups are listed, though it is possible that interest groups may not agree with them completely. Also given are five proposed policies. These policies are the only alternatives possible; they cannot be amended, but only passed or defeated.

Give each student a packet which includes a copy of the simulation instructions, the goals of the seven interest groups, the five policies and the influence allocation form (see following pages for this material).

Go over the following instructions with the entire class:

> This simulation is divided into three 45-minute periods. During each period, each group will have 100 "influence units" to employ in a manner consistent with its decisions. Any units not utilized during the first simulation period will be lost. However, interest groups may defer use of any or all of their influence units for the second simulation period until the third (final) simulation period, if they wish. Influence units may be utilized positively, in support of any combination of policies, or negatively, in opposition to any combination of policies, or in combinations of "positive" and "negative."

At any time, members of any interest group may meet with members of any other interest group to discuss common interests or to attempt to resolve conflicts. At the end of each simulation period, each interest group must submit a completed "influence allocation form" to the game director. After all groups have submitted forms, the game director will report the allocations of each group.

At the end of the third simulation period, the game director (teacher) will tally the total allocations for each of the possible policies. Any policy, or policies, receiving a total net (positive minus negative) allocation of 500 points will be considered to be adopted.

Divide the class into seven groups and assign each group to represent a specific interest group. Make sure each group represents a different interest group and that all seven groups are represented. Give the groups a chance to read through the materials and formulate strategies.

You are now ready to proceed.

SOME GOALS OF INTEREST GROUPS

SPORTSMEN

Try to increase the quality and number of deer available
Try to increase the size of the area available for hunting
Try to increase the authority of the wildlife council
Try to eliminate the Hunter's Choice Season
Try to decrease the number of out-of-state hunting licenses

FARMERS

Try to increase money available for deer removal by wildlife personnel
Try to increase representation on the wildlife council
Try to insure a Hunter's Choice Season
Try to decrease the number of deer
Try to decrease number of hunters on land
Try to decrease land taxes
Try to decrease deer damage to crops
Try to obtain reimbursement for deer damage to crops

NON-FARMING LANDOWNERS

Try to increase deer removal
Try to insure a Hunter's Choice Season
Try to eliminate hunting in the three southernmost counties
Try to decrease the authority of the wildlife council
Support the establishment of a legislative wildlife committee
Try to decrease deer damage to ornamental shrubbery

LEGISLATURE

Try to satisfy constituents concerning deer problem
Try to increase revenue from hunting licenses
Try to increase number of out-of-state licenses
Try to decrease funds allocated to wildlife program
Try to replace the wildlife council with a legislative committee providing the same function

WILDLIFE COUNCIL

Try to defeat a Hunter's Choice Season
Try to have the Natural Resources Administration become a subordinate agency to the Wildlife Council
Try to increase the quality and number of deer in the state
Try to open posted, private land to hunting
Try to eliminate out-of-state hunting licenses

WILDLIFE BIOLOGISTS

Try to increase funds available for deer research
Try to insure a Hunter's Choice Season which includes only the southern and central counties
Try to increase support of proposals made to the Natural Resources Administration
Try to decrease use of deer removal to solve overpopulation

NATURAL RESOURCES ADMINISTRATION STAFF

Try to insure a Hunter's Choice Season
Try to decrease the authority of the Wildlife Council
Try to increase funds allocated to the state's wildlife program
Try to increase the quality of deer available
Try to improve funds available for wildlife management research

POLICY 1

A HUNTER'S CHOICE SEASON SHOULD BE ESTABLISHED, ON A YEARLY BASIS, THROUGHOUT THE STATE

It is apparent that the state of York is plagued by deer damage. Since the most recent research project was not conclusive, some feel that such a season is unwarranted. The Natural Resources Administration Chief feels that interpretation of research on the state's carrying capacity for deer does indicate, even mandates, the Hunter's Choice Season.

Opposition for the season focuses in a very strong, unprofessional lobby--the Wildlife Council. Their viewpoint centers around their own definition of carrying capacity--since the

number of deer killed by winter has not increased, the carrying capacity is not exceeded. They also fear that such a season will severely damage the overall deer crop.

Farmers and landowners cite the increased damage of residential plantings and crops as sufficient proof that the carrying capacity is exceeded. Their concern is with the damage caused by deer, not with damage deer may incur.

Debate, open hearings, closed discussions have caused little compromise from any group thus far.

POLICY 2

THE AUTHORITY AND ACTIVITIES OF THE WILDLIFE COUNCIL SHOULD BE TURNED OVER TO A LEGISLATIVE COMMITTEE (7 ASSEMBLYMEN), WITH THE CHIEF OF THE NATURAL RESOURCES ADMINISTRATION AS TECHNICAL ADVISOR.

The controversy concerning York's deer problem has achieved dubious recognition in all areas of the state's mass media. One editorial in particular (YORK STANDARD 7 April 1970) chastised the Wildlife Council for its "biased determination to preserve its own personal interests."

The Wildlife Council rebutted this article in a short television statement the next day. In addition to stating their position on the "deer crisis," the council members referred to the "inept professionalism and mismanagement" that characterized the York wildlife program.

Nonfarming landowners arranged a writing campaign to one assemblyman in the southern county of Chester. Pressure was great enough, in this election year, for the assemblyman to propose that the Wildlife Council be replaced by a more representative legislative committee.

It is true that the membership of the Wildlife Council is strongly represented by sportsmen. Some have cited this fact as an explanation for their present actions. It is also true that this council has provided the citizens of York with acceptable policy in the past.

POLICY 3

BEFORE A HUNTER'S CHOICE SEASON IS PERMITTED, A STATE-FINANCED RESEARCH PROJECT MUST BE CONDUCTED TO VALIDATE THE EXTENT OF THE OVERPOPULATION PROBLEM.

York wildlife biologists have collected very little data concerning the deer population. Size of the herd has only been estimated once in the past five years (by air census in the

South and North of the state). Individual mobility of existing herds is only vaguely understood. It is painfully obvious, however, that the deer herd is multiplying incredibly fast.

Reports of deer damage have reached epidemic proportions recently. The chief's office in the NRA building receives 10 to 20 letters every week concerning deer damage that private citizens and business organizations have accrued.

No accurate data have yet been accumulated on the exact amount of damage incurred.

POLICY 4

THE CHIEF OF THE NATURAL RESOURCES ADMINISTRATION SHOULD BE EMPOWERED TO MAKE ALL FINAL MANAGEMENT DECISIONS, UPON THE RECOMMENDATIONS FROM THE WILDLIFE COUNCIL AND THE WILDLIFE BUREAU.

Many citizens, and legislative leaders, are of the opinion that policy concerning the management of natural resources should be left to those most capable of rational decisions--the professionals. They are trained specifically for this activity, and are capable of developing the most successful policies.

Other groups, among these the hunters, feel that more is involved in policy-making than scientific methodology and knowledge. That is: since the NRA serves the people, it should take into consideration all effects that its scientific management will have upon the citizens of the state before any policy is established.

POLICY 5

THE STATE APPROPRIATIONS FOR THE WILDLIFE MANAGEMENT PROGRAM SHOULD BE SEVERELY CUT TO PROVIDE MORE FUNDS FOR AN IMPROVED HIGHWAY SYSTEM. TO COMPENSATE FOR THIS REVENUE LOSS, THE CHIEF OF THE NATURAL RESOURCES ADMINISTRATION SHOULD BE EMPOWERED TO ALLOW AS MANY OUT-OF-STATE HUNTING LICENSES AS HE FEELS THE STATE ECOSYSTEM CAN SUPPORT.

While business enterprises are leaving York for a more favorable environment, the present business recession is driving down the tax income for the state. A reversal of this trend is vital! To compensate, legislators feel that financing of state programs, which are not important to the functioning of the state, should be reduced. Among these programs is that of wildlife management. They reason that many out-of-state hunters desire York hunting licenses. The large income from sale of licenses would be adequate to compensate for this

revenue loss. With money available from reduction of this financing, the degenerating highway system could be improved.

Opposition immediately formed to cite: (1) Out-of-state hunters would increase the hazard of destroying the quality of the deer herd. (2) With the existing deer problem increasing, the wildlife program is indeed vital to the functioning of the state. (3) With so little data available on the deer herd, the NRA will not be able to determine how many out-of-state hunting licenses the state ecosystem can support.

HUNTER'S CHOICE

INFLUENCE ALLOCATION FORM

INTEREST GROUP_____

DATE (PERIOD OF SIMULATION)_____

POLICY NUMBER:	INFLUENCE UNITS ALLOCATED
1. A Hunter's Choice Season should be established, on a yearly basis, throughout the state.	_____
2. The authority of the Wildlife Council should be turned over to a legislative committee (7 assemblymen), with the Chief of the Natural Resources Administration as technical advisor.	_____
3. Before a Hunter's Choice Season is permitted, a state-financed research project must be conducted to validate the extent of the overpopulation problem.	_____
4. The Chief of the Natural Resources Administration should be empowered to make all final management decisions, upon recommendations from the Wildlife Council and the Wildlife Bureau.	_____
5. The state appropriations for the Wildlife Management Program should be severely cut to provide more funds for an improved highway system. To compensate for this revenue loss, the Chief of the Natural Resources Administration should be empowered to allow as many out-of-state hunting licenses as he feels the state ecosystem can support.	_____
TOTAL INFLUENCE UNITS ALLOCATED	_____
INFLUENCE POINTS NOT ALLOCATED	_____

PURPOSE: To develop in students an awareness of the dependence we have on the use of insecticides in agriculture.

LEVEL: Senior High School

SUBJECTS: Science
Social Studies

CONCEPT: The management of natural resources is value-oriented.

REFERENCE: Suggested by Susan Ahearn, Doctoral student, Science-Mathematics Education, The Ohio State University.

ACTIVITY: Present the following information to your class:

Apples have more than 500 insects feeding on them throughout the world. In Wisconsin alone there are more than 760 species in some apple orchards. Since apples are high-value crops and they have to be appealing to consumers, they must be entirely blemish-free. Damage by insects and apple diseases have a great effect on the level of acceptance of the apples by the general public. Every year an apple grower is in danger of having his apples destroyed unless he can keep ahead of the pests and diseases. It is imperative that the damage to the apples does not exceed 1 percent of the harvested fruit.

Place the definitions of these pests on the board for clarification:

apple scab - causes dark spots on leaves and fruits
causes fruits to be deformed;
without control, will damage 100 percent of the fruits

powdery mildew - a fungus that attacks Jonathan apples
attacks leaves, fruits

codling moth - the moth lays its eggs on the leaves, twigs and fruit. The larvae develop, crawl into the fruit, and tunnel to the seeds where they feed; causes "wormy apples."

red-banded leaf roller - larvae feed on leaves and surface of apples; has become an important pest since the use of DDT which destroyed its natural enemy.

plum curculio - a weevil; the female punctures the fruit to lay eggs within the apple.

apple maggot - the larva of a fruit fly; they become a problem when unkept apples are around.

other insect pests of secondary importance	other diseases of secondary importance
Leafhoppers	Blotch
Plant bugs	Sooty blotch
Cicadas	Black rot
Japanese beetles	Cedar rust
European red mites	Fireblight
Rosy apple aphids	
Fruit tree leafrollers	
Green fruitworms	

Discuss with your class that all pesticides are poisonous (toxic) to man and other animals but some are more so than others. The extent to which poison affects animals is expressed as the lethal dosage. This toxicity value must be lethal to 50 percent of the laboratory rats with one application of the pure pesticide. The value is known as the LD_{50}. The lower the LD_{50} value, the more toxic is the pesticide. The ORAL LD_{50} value refers to how toxic the pesticide is when given internally to the lab rats. The DERMAL LD_{50} value refers to how toxic the pesticide is when placed on the skin of lab rats. Usually oral application is more toxic than dermal.

Place this table on the board:

Pesticide	ORAL LD50	DERMAL LD50
Guthion	13	220
Systox	6-12	14
Thiodan	43	130
Carzol	20	10,000
Parathion	13	7
Dimecron	23.5	143
Trithion	30	54
Imidan	216	...
Sevin	850	4,000
Captan	15,000	...
Dodine	1,000	1,500

Make a set of 3 cards and duplicate them so that 3 groups will have a set of the same cards. Here is the information for each card:

Card #1

Grower #1 uses these pesticides to destroy these apple pests and diseases. At the end of the growing season, his apples are large, unblemished, red and quite attractive.

During early growth these pests attack	Treatment
European Red Mite	Oil-thion
Rosy Apple Aphid	Parathion
Scab	Dodine
Black Rot	Captan
Powdery Mildew	Sulfer
Cedar Rust	Dodine
Plant Bugs	Guthion
Fruitworms	Guthion
Fruit Tree Leafrollers	Guthion
During Bloom Period	
Fireblight	Streptomycin every 4 to 7 days
While Petals Fall from Blossoms	
Codling moths	Guthion
When Fruit Develops	
Blotch	Benlate
Red Banded Leafrollers	Sevin
Apple Maggots	Sevin
Sooty Blotch	Benlate
Cicadas	Sevin
Codling Moths	Sevin
Japanese Beetles	Sevin (sprayed on fruits, 2 days before harvest)

Card #2

Grower #2 uses these pesticides to destroy these apple pests and diseases. At the harvest time, his apples are slightly blemished and medium-sized.

During Early Growth	Treatment
Scab	Captan
European Red Mites	Oil-thion
Powdery Mildew	Captan
During Bloom	
Scab	Captan
Fireblight	Streptomycin
While Petals Fall	
Scab	Captan
Black Rot	Captan
Plum Curculio	Guthion

When Fruit Develops

Blotch	Dodine
Codling Moths	Guthion
Leafhoppers	Sevin
Cicadas	Sevin
Japanese Beetles	Sevin (applied 2 days before harvest)

Card #3

Grower #3 uses these pesticides to destroy these apple pests and diseases. At the harvest time, his apples are somewhat wormy and small.

During Early Growth	Treatment
Powdery mildew	Captan
Green fruitworm	Imidan rather than Guthion

During Bloom Period

Scab	Captan

White Petals Fall

Codling moths	Imidan
Plum curculio	Imidan

When Fruit Develops

Codling moth	no treatment
Blotch	no treatment
Apple Maggots	no treatment

Bring in three different kinds of apples to the class (Jonathans, Rome Beauties, Delicious, etc.). Divide each apple into enough pieces that each student will get a taste of each apple. Ask the students which apple they liked best and why. Then divide the class into three groups, with groups being composed of those people who like each kind of apple. Distribute three cards to each group. The members of each group (who all like the same kind of apple) should now discuss, among themselves, the situations presented on the cards. Then ask each person to decide from which grower he/she would buy apples to eat. Suggest that the students discuss the differences between each grower's problems and treatments to the apples.

PURPOSE: To participate in a simulation to pursue value questions relating to the differences of opinions between what are essentials and what are luxuries.

LEVEL: Senior High School

SUBJECT: Social Studies

CONCEPT: Supply and demand in relation to the values and needs held by society determine what is a resource and its economic values.

REFERENCE: Suggested by David L. Hanselman, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: With your class, make a list of 10 to 15 charities they believe are worthwhile and would like to be able to support financially. Place the names of each selected charity on separate small containers (such as a paper cup) and line them up in a corner of the room. Inform your students that this will be known as the "charity corner" and that these containers will serve as collection boxes.

Now, give each student a Money Sheet, a Priority Ranking of Items Sheet and two or three item cards (see pp. 124-130) Inform the students that each has $3,500 in cash. And, each has several "items" which he/she may keep or sell. Also, there's the "charity corner" where anyone may, if he/she wishes, donate to various causes. The objective is to spend the money for things you want--for things that make you happy. Common barter using your cash is the only means of exchange, but when "time" (15 minutes) is called, the money you have means nothing--just the items you have acquired.

Give the students time to fold the sheet of money and tear or cut into the ten bills. Next, give them about 10 minutes to rank in priority the items for barter and explain this is the time to begin planning individual strategies for when the bartering begins. After this task is completed, you are ready to begin.

Tell the class that when the signal "start bartering" is given, each of them is to try to find the items he/she wants and make charitable contributions if desired. An item can be bought and sold any number of times. DO record the selling price on the back of the item card each time a transaction is made. Call attention to the "charity corner" where you have the several collection boxes for different causes. Remind them there is a time limit of 15 minutes. Then give the signal to start. After eight minutes put a paperclip around the money which has been contributed in each charity box. Stop the bartering when time is up and assemble the group informally for discussion. Although you should use focusing questions, be sensitive to direction others pursue; don't overfocus.

Suggested Focusing Questions for Discussion:

How successful were you in your bartering--did you get the things you wanted?

What items did everybody seem to want? What was in low demand?

What things brought the highest price? Lowest price?

Does the barter system work best in meeting the sellers' or buyers' objectives?

Ask several to volunteer what they set out to get--their strategy and how successful they were.

Pick a few items. Who got each one? Why did they get it--what was valued about it? (Personal satisfaction, societal costs, what others would think.)

How do you think you would have played the game IF--(you were 10 years younger, 20 years older, lived in Mexico or India, etc.).

How many made charitable contributions? To which causes? Why? (It's easier to be charitable with play money than with real money! Because really wanted to--thought it was expected--or to impress others.)

When did you make your contributions to charity? (Compare how much was given in first half and second half of game--presumably after "items" had been acquired and money was approaching the point of valuelessness.)

What would have happened (or what did happen) if the wealth was unequally distributed? (Compare to real-life personal wealth and national wealth.)

Do you believe in the "free market" way of life? Why or why not?

Should everything be distributed on the barter system? Medical care? Adequate diet?

Would you propose any alternate scheme for distribution of essentials and luxuries?

MONEY SHEET

$50	$50
$100	$100
$100	$100
$500	$500
$1,000	$1,000

PRIORITY RANKING OF ITEMS

Items for Barter	Priority Ranking 1	2	3	4	5
Two-year-old VW Bus. Very good					
A wind generator that will produce 50% of home electrical energy needs					
A sophisticated pocket computer--all functions					
Ten-room suburban home, 1/4 acre lots					
A canoe					
Nikon F Camera					
Trail bike					
Four-wheel drive Blazer wagon. New					
An obscure, but original, Picasso painting					
Fifty books of your choice--all fiction					
Fifty books of your choice--all nonfiction					
Complete backpacking gear--tent, pack, shoes, bag, etc					
One-year-old Honda car. Very good					
Ninety horse outboard boat and skis					
Kenwood home stereo system					
Wood-burning stove (heat and cook)					
Five-room apartment on 12th floor in center of city					
Plane tickets and two-week tour of Africa					
Old rural eight-room house and five acres					
Musical instrument of your choice					
One-week all expense trip to Las Vegas					
One-week all expense canoe trip for two through Algonquin Park (Canadian wilderness)					
One year all expenses to college of your choice					
Summer cabin in Adirondacks (part of development on lake)					
Full home air conditioning system					
Ten-year lease on garden space and all tools, seeds, canning supplies					
Cross-country skis, boots and clothes					
Snowmobile					
Top quality ten-speed bike					
A 12' x 24' greenhouse					
Twenty tickets for meals of your choice at city's top restaurants					
Lifetime subscription to any ten magazines or journals					
An all expense paid six-day hunting trip to Montana (big game)					
A 30-foot sailboat					
A $75,000 paid-up life insurance policy					
A private jet trip and expenses to Bahamas for five days					
Eighty acres including small lake frontage in Adirondacks. No buildings					
A 22-foot Winnebago motor home					
Complete wardrobe of high fashion clothes					
Unlimited bus travel in U.S. (cross-country and in cities) for two years					
A freezer full of top quality steaks					
A 20-year supply of beans, rice, other protein foods					
A good saddle horse					
A solar energy unit which meets 70% home heating needs					
A six-foot pet python (non-poisonous)					

ITEM CARDS

Two-year-old VW Bus.
Very good.

A wind generator that will produce 50% of home electrical energy needs.

A sophisticated pocket computer--all functions.

Ten-room suburban home 1/4 acre lots.

A canoe.

Nikon F Camera.

Trail bike.

Four-wheel drive Blazer wagon. New.

An obscure, but original, Picasso painting.

Fifty books of your choice--all fiction.

Fifty books of your choice--all nonfiction

Complete backpacking gear--tent, pack, shoes, bag, etc.

One-year-old Honda car. Very good.

Ninety-horse outboard boat and skis.

Kenwood home stereo system.

Wood-burning stove (heat and cook).

Five-room apartment on 12th floor in center of city.

Plane tickets and two-week tour of Africa.

Old rural eight-room house and five acres.

Musical instrument of your choice.

One-week all expense trip to Las Vegas.	One-week all expense canoe trip for two through Algonquin Park (Canadian wilderness).
One-year all expenses to college of your choice.	Summer cabin in Adriondacks (part of a development on lake).
Full home air conditioning system.	Ten-year lease on garden space and all tools, seeds, canning supplies.
Cross-country skis, boots and clothes.	Snowmobile.
Top quality ten-speed bike.	A 12' x 24' greenhouse.

Twenty tickets for meals of your choice at city's top restaurants.

Lifetime subscription to any ten magazines or journals.

An all expense paid six-day hunting trip to Montana (big game).

A 30-foot sailboat.

A $75,000 paid-up life insurance policy.

A private jet trip and expenses to Bahamas for five days.

Eighty acres including small lake frontage in Adirondacks. No buildings.

A 22-foot Winebago motor home.

Complete wardrobe of high fashion clothes.

Unlimited bus travel in U.S. (cross-country and in cities) for two years.

A freezer full of top quality steaks.

A 20-year supply of beans, rice and other cereal protein foods.

A good saddle horse.

A Solar energy unit which will meet 70% home heating needs.

A six-foot pet python (non-poisonous).

PURPOSE: To provide an opportunity for individual students to discover how their beliefs stack up against the beliefs of fellow classmates.

LEVEL: Senior High School

SUBJECT: Social Studies

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Suggested by David L. Hanselman, SUNY College of Environmental Science and Forestry, Syracuse, New York 13210.

ACTIVITY: Explain to your students that voting is a method of comparing individual beliefs to the beliefs of a group. This gives individuals a chance to affirm their beliefs. To vote "YES" raise your hand. To vote "NO" thumbs down. Undecided, cross arms.

How many think it's right to take antipollution devices off cars to save gas? (Discussion: Why? Why not?)

How many think it's wrong for Americans to overeat and maintain high meat diets when so many in the world are starving? (Discussion: So what can you do about it?)

How many of you think that Judeo-Christian philosophies (i.e., God created the world for man, and man has dominion over it) are a major cause of our present environmental dilemma?

(Is your group prepared for this one? Do they know enough about Eastern religions and indeed about Jewish and Christian teachings to handle this? If not, and if you want to help them in clarifying the values this question raises, assign students to research the Judeo-Christian teachings related to man's dominion over his environment. Discuss how these teachings might influence man's attitudes toward the environment. What kinds of practices do we currently engage in that reflect those attitudes? After students have had an opportunity to think about and discuss these concepts, engage in the voting process.)

PURPOSE: To demonstrate that the way people view others in society is related to the values they hold.

LEVEL: Senior High School

SUBJECT: Social Studies

CONCEPT: Conflicts emerge between individual values and the maintenance of environmental quality for the general public.

REFERENCE: Suggested by Robert L. Townsend, Ph.D. Candidate, Science Education, The Ohio State University.

ACTIVITY: Present your students with the following situation:

An atomic attack has occurred. The following eleven persons--the only humans alive on earth--are in an atomic bomb shelter. It will take two months for the external radiation to drop to a safe level; however, the supplies in the shelter can only sustain seven persons for two months, at a very minimal level. In brief, only seven of the eleven people can survive.

1. Dr. Dane: Thirty-seven; white; Jewish; Ph.D. in history; college professor; good health; married; one child (Bobby); active; enjoys politics.

2. Mrs. Dane: Thirty-eight; white; no religious affiliation; B.A. and M.A. in psychology; counselor in mental health clinic; good health; married; one child (Bobby); active in community.

3. Bobby Dane: Ten; white; Jewish; special education class for four years; mentally retarded; I.Q. 70; good health; enjoys his pets.

4. Mrs. Garcia: Thirty-three; Spanish-American; Catholic; ninth grade education; cocktail waitress; prostitute; good health; abandoned as a child; in foster home as a youth; raped by foster father at age twelve; ran away from home; returned to reformatory; stayed until sixteen; married at sixteen; divorced at eighteen; one child three weeks old (Jean).

5. Jean Garcia: Three weeks old; Spanish-American; good health; still nursing.

6. Mary Evans: Eight; black; Protestant; third grade; good health.

7. Mr. Newton: Twenty-five; black; atheist; starting last year of medical school; suspected homosexual activity; good health; seems bitter concerning racial problems; wears hippie clothes.

8. Mrs. Clark: Twenty-eight; black; Protestant; college graduate; electronics engineer; married; no children; good health; enjoys sports; grew up in ghetto.

9. Mr. Blake: Fifty-one; white; Mormon; B.S. in mechanics; very handy; married; four children; good health; enjoys outdoors and working in his shop.

10. Father Franz: Thirty-seven; white; Catholic; college plus seminary; priest; active in civil rights; criticized for liberal views; good health; former college athlete.

11. Dr. Gonzales: Sixty-six; Spanish-American; Catholic; doctor in general practice; two heart attacks in past five years; but continues to practice.

THE PROBLEM: Which seven of the eleven people in the bomb shelter should survive?????

After the students have had an appropriate amount of time to make their choices, hold a discussion to determine why they picked certain people to survive. Is there a general consensus about who should survive? What values are suggested by these decisions?

PURPOSE: To suggest that lifestyle plays a part in determining the type of education that is desirable for different groups of people.

LEVEL: Senior High School

SUBJECTS: Language Arts
Social Studies

CONCEPT: Part of the meaning of a culture can be understood by exploring the interaction of societal values and events with the environment.

ACTIVITY: Share the following with your students:

In June, 1774, the Governors of Maryland and Virginia negotiated a treaty with the Indian tribes of Pennsylvania. The Indians were invited to send boys to William and Mary College. The next day the Indians declined the offer with the following words:

> *We know that you think very highly of the kind of learning taught in those colleges, and that providing for the education of our young men would be very expensive to you. We are convinced that you mean to do us good by your proposal; and we thank you very much. But you, who are wise, must know that different nations have different ideas of things and you will therefore not take it wrong if our ideas of education happen not to be the same as yours. We have had some experience of it. Some of our young people were educated in your colleges. When they returned to us they were bad runners, ignorant of the ways of the forest, and unfit for hunters, warriors, or counselors. They were totally good for nothing. We are, however, not the less obliged by your kind offer; and to show our gratefulness, if the gentlemen of Virginia will send us a dozen of their sons, we will take care of their education, instruct them in all we know, and make men of them.*
>
> *Lancaster, Pennsylvania*
> *1774*

As a class, discuss the stand the Indians of Pennsylvania were taking about the kind of education that is desirable for their youth. What kinds of subjects might be included in the Indian Nation's curriculum? Survey your students to see how many, if any, of them think the people from Virginia-Maryland should have accepted the Indians' offer to educate their sons. Why? Why not? How many do they believe probably took advantage of the offer?

Now, share the following statement made by an Indian leader some seventy years later:

The following words were spoken by Tecumseh of the Shawnee Indians:

> *Oh, yes, I went to the White Man's schools. I learned to read from school books and newspapers. But in time I found that these were not enough. Civilized people depend too much on man-made printed pages. I turn to the Great Spirit's book when I want to learn about the world. You can read a big part of that book if you study nature. The Great Spirit has provided you and me with an opportunity for study in Nature's university by learning about the forests, the rivers, the mountains, and the animals.*
>
> *1848 in the State of Montana*

What does this imply in regard to changes in educational values?

Ask your students whether they believe an exchange of youth from the two cultural backgrounds would be desirable today. What circumstances, if any, might make this type of an exchange desirable?

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Unless otherwise noted, these publications are available in both microfiche and hard (paper) copy from Educational Document Reproduction Service (EDRS), and may be located in ERIC microfiche collections. Most are also available in printed form from:

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Mathematics, and Environmental Education
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ED 091 172
John H. Wheatley and Herbert L. Coon, One Hundred Teaching Activities in Environmental Education. 1973; 204 pages. IRC price: $4.50.

ED 102 031
John H. Wheatley and Herbert L. Coon, Teaching Activities in Environmental Education, Volume II. 1974; 200 pages. IRC price: $5.15.

ED 125 868
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Mary Lynne Bowman and Herbert L. Coon, Environmental Education in the Urban Setting: Rationale and Teaching Activities. 1977; 208 pages. IRC price: $4.40.

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ED 162 897
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