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ABSTRACT

This report advocates the use of a process approach in learning about the environment and supports the teaching of responsible environmental decision making skills through an inquiry and valuing focus. Teaching is viewed as a process of structuring experiences, raising questions, sharing activities, and guiding students to the attainment of intellectual skills. A list of selected comments on teaching styles, valuing processes, and student behaviors are provided in the context of environmental education. The main body of the report consists of a list of fourteen inquiry and valuing skills and related activities. These are intended to assist teachers in implementing a process approach with a valuing component to their environmental courses. The following are representative examples of the suggested skills: (1) identifying and applying moral principles to specific environmental problems and issues; (2) examining and evaluating lifestyle patterns and associated value systems; (3) examining and evaluating the accomplishments of significant human models; (4) listing and prioritizing standards for making decisions and examining conflicts among them; and (5) identifying value conflicts in everyday life situations. An environmental values and ethics bibliography is also included. (ML)

Using Valuing and Inquiry Skills in Environmental Education

C. E. Knapp

The ultimate goal of environmental education is to equip citizens with a value system and decision-making skills for choosing a wise course of environmental action. These choices must result in the improvement or maintenance of a quality environment. A quality environment can be determined by the ability of human beings to sustain life on the planet and to feel a sense of satisfaction regarding their physical and mental health. The process of living involves the constant ordering and re-ordering of values in order to make decisions.

Research has supported the teaching of responsible environmental decision making through effective inquiry and valuing skills. Unfortunately, educators and citizens have not supported environmental education to the degree that is necessary. This is especially true at the secondary levels of public education.

McTeer's study[1] revealed that high school students ranked an environmental curriculum objective as the most important among eleven other educational objectives. In the same study parents ranked the environmental objective fourth, teachers ranked it tenth, and administrators ranked it eleventh. It is evident from this study why environmental education has not been given the highest priority in the curriculum despite the preferences of high school students.

Steiner[2] found that high school students criticized educational institutions because schools did not adequately address society's important environmental issues. For example, in a study of environmental education in Missouri schools by Trojcak and Harvey[3], they discovered that 69% of 270 district superintendents who responded did not require environmental education in the curriculum. Further, 36% of the districts responding did not include environmental education as a curricular option. The study also revealed that only 8% of the districts used commercial environmental or conservation programs.

Bohl's study[4] of 270 schools in 22 states revealed that the average tenth and twelfth grader possessed a limited amount of cognitive environmental information. Childress's national survey[5] showed that program and project objectives in environmental education were focused more on acquiring knowledge and developing appreciations than upon helping students solve environmental problems and develop problem-solving skills.

In a study of eleventh graders, Iverson[6] concluded that: 1) "Instructional opportunities aimed at helping the student determine what is important to him in establishing a working set of values seems appropriate for all students." 2) "To reach long-range goals of either environmental knowledge or environmental concern, instruction in both cognitive and affective domains is essential."

The literature clearly supports the use of a process approach in learning about the environment. This paper takes the position that an inquiry and

valuing skills focus is preferred to a content focus. The way to teach environmental decision making skills is to allow students to decide about relevant problems and issues. The way to teach inquiry skills is to allow students to investigate problems and issues. The way to teach valuing skills is to allow students to take positions on specific problems and issues. Providing students with accurate facts, key concepts, and "proper" environmental attitudes is not enough. Teachers and students need to use facts, concepts, and attitudes to make decisions about environmental problems and issues.

Teaching is not merely telling facts and concepts to students. Teaching is viewed more as a process of structuring experiences and raising questions aimed at reaching certain objectives. After sharing common activities, either experientially or through discussion, students are guided toward the attainment of intellectual skills.

The role of the teacher is viewed more as a facilitator of learning and a creator of a learning climate than a conveyer of specific knowledge.

Most human beings behave on the basis of what they believe when in a safe and supportive environment. As teachers, we need to be clear about what we believe about environmental education.

1. Sharing a variety of opinions about a topic or issue encourages learning.

2. It is desirable to discuss certain controversial topics in a school setting.

3. The classroom extends beyond the four walls of a room to include the school, community and surrounding area.

4. Teachers can modify lessons for their students based on the needs and interests of all concerned.

5. The direct application of concepts, attitudes and skills to life problems is essential for learning to occur.

6. A single activity idea can be useful with a wide range of ages and developmental levels when properly modified.

7. Inquiry and valuing skills are important to teach along with concept development.

8. Behavioral objectives are important aids in guiding and focusing learning.

9. Learning can take place in a variety of small and large group settings.

10. A learning cycle progresses sequentially from individual awareness through an examination of personal lifestyles.

11. Students learn best when they have opportunities to participate in an experience or discuss past experiences together to create a relatively common conceptual base.

12. Most students have a great capacity to be creative and inventive.

13. People can learn by thinking about and answering convergent and divergent questions.

14. Values can be learned by structuring lessons which focus on value-laden issues.

15. A safe and supportive learning climate can be established to encourage effective decision making and problem solving.

The following list of fourteen inquiry and valuing skills and related activities is intended to assist teachers in implementing a process approach to environmental education.

1. Defining terms and analyzing words and phrases for emotional and/or judgmental impact.

Activity—

a. Define the following terms in order to communicate their meaning clearly to others:

quality environment, clean air, luxuries, necessities, renewable and nonrenewable resources, ecological balance, nature, resource

b. Read the following paragraphs and underline the words which communicate feelings and emotions. Examine these words and place a + or - above them depending upon whether or not the words create positive (+) or negative (-) feelings to you.

Dear Member,

I'm writing this emergency letter because I think you understand better than most the work we must do immediately to protect America's wildlife and environment.

Here's the hazardous situation we face as you read this...

> Right now, in Washington, the financial underpinnings from many federal programs that help insure clean water, clean air, and which maintain and protect the environment have been cut. These laws and regulations guard our country's natural beauty and health. They are being seriously weakened, or entirely eliminated.

It's as if they had decided to turn the clock back by decades to those times when so few people even cared about wildlife. But, even then, this Federation was calling out for change and reform.

And, to make things doubly difficult today, this dangerous shift in national policy is being done in the name of "cost cutting." It's actually life cutting. We are all threatened by these actions — you and I, our children, and children yet to come. So we must stand up, speak out, and fight against every irresponsible attempt to knock out the laws that protect our lives.

What's at stake? The Clean Air Act, the Clean Water Act, the Endangered Species Act, the Marine Mammal Protection Act — and many others. If these environmental gains of the last decade are wiped out with the misinformed stroke of a pen, we may never make up the loss.

> Ground and surface water pollution will go unchecked, animals will lose habitat in the name of "development," land will be scarred and ruined in the search for oil, whole forests, now protected by law, will be cut to the ground, air will be unfit to breathe. Not a pleasant thought...and perhaps a fatal one.

And yet we share the basic position our nation's leaders are taking, "cut federal spending!" Good. That's a strong conservationist point of view.

But we can have both. Economic growth for America, and conservation, can (and must) go hand in hand. Our job is to convince our lawmakers that it can be done. And, in the spirit of cooperation, we have even presented specific recommendations for balancing the federal budget while maintaining these necessary environmental programs.

From a letter by Jay D. Hair, Executive Vice President, National Wildlife Federation.

Paradise or elitism? It pays to look at the kind of world the anti-growth, anti-nuke, anti-oil people are trying to lead us to. Consider this gem, for example, from Paul R. Ehrich, biologist and nuclear opponent: "Giving society cheap, abundant energy...would be the moral equivalent of giving an idiot child a machine gun." Aside from the slurs on the average American's intelligence—"idiot child" indeed—we don't think that an elite class should decide what's good for us. A lot of people don't have it made yet, and need energy to climb the ladder.

From an advertisement by the Mobil Corporation, Parade, October 28, 1979, p. 27.

2. Examining standards or criteria for establishing what is right or good and analyzing their sources.

Activity—

Examine the following statements of environmental standards and expectations. Place the letter "A" (agree) next to the statements you agree with and a "D" (disagree) next to the statements that you disagree with. Hypothesize about why the writers might hold some of these values. Develop a list of your expectations concerning other people and the environment.

Declaration of Dependence on the Land

The tradition of native peoples has always been one of respect for the earth and conservation of her resources. For many of today's Native Americans, this tradition is still a relevant and binding philosophy. In the summer of 1980, some 23 Indian nations and 36 other nations gathered near the Black Hills of South Dakota for an "International Survival Gathering." They issued a statement of concern, detailing what they see as 20th century abuses of the land and outlining programs which they feel will remedy the misappropriations. Excerpts from their document follows:

Land is a sacred trust and a precious resource. Together with the water that flows under and through it and the air that flows around it, the land has been created by God, the Great Spirit, and given in sacred trust to all living creatures. The land is one, its water, soil, air, elements within and living creatures are a whole, not meant to be divided and abused. Mother Earth nourishes her children, and they are to treat her with respect. They are to live in harmony with her and with each other.

But the sacred trust has been violated. The harmony has been shattered The land has been desecrated because it has been treated as a commodity. Mother Earth has been violated by individuals and corporations who abuse her or appropriate her for their own selfish ends.

The abuse and appropriation of the land alienate people from their rightful inheritance and true heritage. They also pose both short and long term threats to the survival of Mother Earth and of all living creatures.

We come to express our outrage at the desecration of the land. We realize that those who violate the earth here in North America do so throughout the world in an international conspiracy to satisfy their greed and deprive all peoples of the lands entrusted to them by the Creator.

We call for the restoration of the sacred relationship among all creatures and the earth. We declare our dependence on the land, and urge all peoples to recognize their own dependence on the land for their lives and livelihoods.

We demand an end to the abuse and appropriation of the land. We invite all concerned peoples to struggle with us to achieve that goal.

We call for land justice for Native Peoples: recognition of their sovereignty and traditional forms of government.

We call for all nations to acknowledge that international law holds that all treaties are binding upon the nations that contract them, and cannot be changed without the consent of all the parties involved.

We call for an end to all genocidal programs which uproot, displace and relocate Native Peoples and other rural peoples.

We call for the promotion of family farms and ranches, especially through owner-operator and residency requirements, and parity programs tied to conservation practices that lead to the eventual elimination of agricultural dependence on chemical pollutants of the land.

We call for the recognition of the right of family farmers and ranchers to exercise stewardship over family-sized holdings in treaty areas restored to Indian control, as long as they respect and care for these lands, through long term, renewable leases negotiated with tribal governments.

We call for support of the efforts of all minority peoples to secure a land base.

We call for the return of federal and state lands in treaty areas to Native Peoples and other land-based peoples.

We call for an end to the urban development that misuses rural land, especially prime agricultural land and areas of natural beauty.

We call for control of rural water resources by the consensus of all land-based people, and protection of water quality and quantity for rural and urban needs.

We call for the termination of all phases of nuclear energy development, and the promotion of safe and clean energy alternatives.

We call for an end to nuclear weapons development and the dismantling of nuclear weapons systems.

We call for the promotions of sisterhood and brotherhood among peoples of all races and social classes.

We call for the establishment of a solidarity network with other people engaged in the international struggle for justice on the land.

Finally, we call for the recognition of our responsibility to be stewards of the land, to treat with respect and love our Mother Earth, who is a source of our physical nourishment and our spiritual strength.

Rituals of the Earth, A special Newsletter of the Sigurd Olson Environmental Institute, Northland College, Ashland WI, Vol. 2, No. 1, Fall-Winter, 1980.

3. Empathizing with others holding differing value positions represented in a conflict.

Activity—

For each of the selections above, state the main message in a sentence. Explain why the National Wildlife Federation and the Mobil Oil Corporation may view an environmental issue differently. What are some important values about economics and ecology that each group may hold?

4. Predicting the balance between "good" consequences and "undesirable" consequences resulting from various alternatives proposed to solve value conflicts.

Activity—

We need and like the private automobile for traveling to and from the city, but an abundance of vehicles pollutes the air. List the pluses and the minuses involved in not driving an automobile in the city.

For example:

(+)	(-)
-improves air pollution	-less convenient to take public transportation
-uses less oil and gas	-more crowded public transportation
-results in less noise	-may reduce auto sales
-saves money	

Analyze other consequences of actions in the same way in order to decide on solutions to environmental problems.

Activity—

Read "The Vermiculite Controversy" and consider the balance between pros and cons in the issue of whether or not to mine the area. Weigh the pros and cons and make a decision. What values guided your final decision?

The Vermiculite Controversy

A volcano erupted millions of years ago in Louisa County Virginia. The volcano left a small 14,000 acre pocket of a mineral beneath the surface called vermiculite. Vermiculite comes from the Latin word "vermis" meaning worm. When the mineral is heated it expands into wormlike shapes. It is used for cat litter, in insulation products, in concrete, and in agricultural soil conditioners. The big issue in Louisa County is whether to mine the vermiculite deposits or not. There are people on both sides of the controversy. There are strong reasons to support each side. Here are some pro's and con's.

Pro mining

(1) Some land owners want their land mined so that they can make money.

(2) The mines would attract industry, create new jobs, and raise the tax base in the county.

(3) Vermiculite is a very useful product.

(4) It is wasteful not to use the vermiculite by developing the area. Progress must come if the people are to raise their standard of living.

(5) The Board of Supervisors voted 5 to 1 to rezone the area to allow mining and changed the county ordinance to allow mining almost anywhere, no matter what the zoning.

Con mining

(1) The United States Department of the Interior declared the area a National Historic Landmark because of the colonial architecture.

(2) The mining would change the land by digging 10-acre pits up to 75 feet deep. Roads, settling ponds, and dumps would have to be built. Over 400 acres of land would be damaged.

(3) The land was zoned for agriculture, not for mining, for many years.

(4) The Department of the Interior believes that the mining operation would harm the scenery of the area.

(5) Some land owners want to preserve the "unspoiled" and historical values of the land.

What other pro's and con's can you think of? Do you think the area should be mined? If you owned land in the area and could become rich by mining the vermiculite, would you sell or lease your land? Would you vote to change the zoning from agriculture to mining use? Who should have the say in how the land is used, the local people or the Federal Government?

From Humanizing Environmental Education: A Guide for Leading Nature and Human Nature Activities by Clifford E. Knapp and Joel Goodman, American Camping Association, Martinsville, Indiana, 1981, pp. 87-88.

5. Identifying and applying moral principles to specific environmental problems and issues to evaluate how they relate.

Activity—

Read the following statements of personal moral principles regarding the environment. Evaluate how they would relate in each of the following environmental activities:

1. Using Federal wilderness areas for extended large group backpacking trips.

2. Homesteading a forty acre tract of land.

3. Building an airport in a swamp near a large city.

4. Hunting deer on a wildlife refuge.

Make an "I believe..." list of principles you think are morally right. How do the items on your list relate to specific environmental activities?

. . . Recognizing that life itself is a gift, and a call to responsibility, joy, and celebration,
I make the following declarations:

1. I declare myself to be a world citizen.

2. I commit myself to lead an ecologically sound life.

3. I commit myself to lead a life of creative simplicity and to share my personal wealth with the world's poor.

4. I commit myself to join with others in the reshaping of institutions in order to bring about a more just global society in which all people have full access to the needed resources for their physical, emotional, intellectual, and spiritual growth.

5. I commit myself to occupational accountability, and so doing I will seek to avoid the creation of products which cause harm to others.

6. I affirm the gift of my body and commit myself to its proper nourishment and physical well-being.

7. I commit myself to examine continually my relations with others, and to attempt to relate honestly, morally, and lovingly to those around me.

8. I commit myself to personal renewal through prayer, meditation, and study.

9. I commit myself to responsible participation in a community of faith.

From Shakertown Pledge from No More Plastic Jesus by Adam Finnerty

A BIOETHICAL CREED FOR INDIVIDUALS

1. Belief: I accept the need for prompt remedial action in a world beset with crises.

   Commitment: I will work with others to improve the formulation of my beliefs, to evolve additional credos, and to unite in a worldwide movement that will make possible the survival and improved development of the human species in harmony with the natural environment.

2. Belief: I accept the fact that the future survival and development of mankind, both culturally and biologically, is strongly conditioned by man's present activities and plans.

   Commitment: I will try to live my own life and to influence the lives of others so as to promote the evolution of a better world for future generations of mankind, and I will try to avoid actions that would jeopardize their future.

3. Belief: I accept the uniqueness of each individual and his instinctive need to contribute to the betterment of some larger unit of society in a way that is compatible with the long-range needs of society.

   Commitment: I will try to listen to the reasoned viewpoint of others whether from a minority or a majority, and I will recognize the role of emotional commitment in producing effective action.

4. Belief: I accept the inevitability of some human suffering that must result from the natural disorder in biological creatures and in the physical world, but I do not passively accept the suffering that results from man's inhumanity to man.

   Commitment: I will try to face my own problems with dignity and courage, I will try to assist my fellow men when they are afflicted, and I will work toward the goal of eliminating needless suffering among mankind as a whole.

5. Belief: I accept the finality of death as a necessary part of life. I affirm my veneration for life, my belief in the brotherhood of man, and my belief that I have an obligation to future generations of man.

   Commitment: I will try to live in a way that will benefit the lives of my fellow men now and in time to come and be remembered favorably by those who survive me.

From Bioethics: Bridge To The Future by Van Rensselaer Potter. Prentice-Hall, Inc. Englewood Cliff, New Jersey, 1971.

Trail Users' Code of Ethics

1. I will appreciate the solitude and beauty of the trail and the surrounding environment. I will respect the feelings of others toward it.

2. I will do my best to preserve the natural and historic features which attracted me to the trail.

3. I will not disturb plant and animal wildlife along the trail.

4. I will use only established campsites and rest areas when available.

5. I will reduce the litter problem by carrying out all that I take in, and more.

6. I will take care to conserve the improvements that have been placed along the trail.

7. I will use a trail only for its designated purpose.

8. I will not promote activities or create situations that disturb others.

9. I will promote the use of maps, educational materials and equipment that will help trail users achieve maximum enjoyment.

10. I will exercise utmost care with open fires.

11. I will not exceed my physical or technical capabilities and will travel equipped to meet emergency situations.

12. I will treat property of others with the same care I would give my own property by not entering posted land, by observing laws and regulations and by discouraging violations of them, by getting permission before entering private property, and by not disturbing livestock nor passing over cultivated fields.

From "Environmental Education News for School People." Information and Education Division, Michigan Department of Natural Resources, Box 30028, Lansing, Michigan 48909. Page 3.

6. Examining and evaluating lifestyle patterns and associated value systems in ourselves and others.

Activity--

In a group of about 8-10, do the Alpha-Centauri Consensus. After completing the exercise write a paragraph about what you learned about your lifestyle and the lifestyles of others. Do certain values conflict with others in yourself and in others? Are there any aspects of your lifestyle that you want to change? If so, write an action plan for doing this.

The Alpha-Centauri Consensus

You are lost in space on an unknown planet, able to support human life. From your spaceship, you were able to salvage only the items listed below. You are first to list privately six of the total list most important to your survival, and arrange them in order of priority. Next, the group will attempt to come to consensus as to which six objects are most important to the survival of all, and list them in order of priority. Resources already existing on the planet are: an abundance of fresh water; trees with assorted fruits known to be non-poisonous; wild birds and animals; lots of trees and rocks; vines and large-leafed plants; an atmosphere with enough oxygen to support human life.

NOTE: The group may not appoint a leader, and they must make all decisions by consensus: two thirds agree and the others say "I can live with that."

1. One axe
2. A package of seeds
3. A box of matches
4. A rope ladder
5. A rifle with 200 bullets
6. A history of the Earth
7. A steel handknife
8. One ten-gallon steel pot
9. A large needle
10. A box of 5'x5' watertight canvas pieces and a needle
11. A saw
12. A hammer and box of nails
13. A watertight barrel of beef jerky
14. A first-aid kit and manual
15. A book called "Survival on Alien Planets"
16. A writing kit with pens and paper

MY SURVIVAL PRIORITY LIST

1.
2.
3.
4.
5.
6.

GROUP CONSENSUS PRIORITY LIST

1.
2.
3.
4.
5.
6.

Source Unknown

7. Finding relevant and accurate facts related to environmental issues and assessing whether or not they support or negate particular actions.

Activity---

Do the Environmental Decision-Making exercise. Determine if the information about possible consequences caused any re-ordering of your priorities. Through reading and discussion, add more possible consequences to each situation. Does this added information cause any re-ordering of priorities? Does factual information make a difference to some people in deciding an issue?

Directions for Environmental Decision-Making

How To Use The Problem Cards:

Some environmental problems will be presented to you on separate cards. With each problem card, you will find five alternative solutions to the problem. You are to read each problem and then arrange the solutions in front of you from top to bottom according to the solution you would favor first (on the top) to the solution you would favor last (on the bottom). All five solutions must be ranked according to priority, even if you don't agree that one or more are effective ways of dealing with the problem. When you have ordered the solutions in the manner that you think best, record the letter of each statement on an answer sheet. Then replace them all in the problem card envelope. Go on to the next problem card and repeat the same procedure.

Problem Card #1

A Kansas farmer is considering expanding his 1200 acres of cultivated land by draining all 100 acres of his wetlands and planting crops on the reclaimed land.
Would you favor:

C Prohibiting the destruction of all wetlands in the geographic area by legislation

O Urging him to attempt to increase the yield per acre on the existing cultivated land

N Convincing him to drain only part of his wetlands in order to preserve this natural community

S Doing nothing and allowing the draining since the decision is the farmer's to make

E Convincing him to create more wetlands instead of draining the 100 acres

Problem Card #2

A Federal agency proposes to dam a stream located in a heavily forested area to form a large, recreation lake. Opposition to the plan arises from a group of people including scientists and wilderness users. Would you favor:

C Supporting the lake plan because it takes into consideration the recreational needs of most of the general public

O Modifying the lake plan so that all possible recreational and scientific desires will be provided for

N Preserving the free-flowing stream but developing the area for a greater variety of recreational opportunities

S Preserving the free-flowing stream and permitting no additional recreational development in the area

E Building the lake in another location in the region and preserving the original site as a wilderness area

Problem Card #3

You live in a metropolitan, industrialized city. Under certain weather conditions, the smog level in the city accumulates to a point where it is visible and affects the breathing of many residents and endangers the lives of those with respiratory problems. Would you favor:

C Writing a letter expressing disapproval of the pollution sources and requesting their elimination

O Equipping your car with a device designed to reduce air pollution

N Ceasing to burn refuse in your open incinerator, a practice which is permitted by law

S Publically endorsing more strict pollution control legislation and the enforcement of existing legislation

E Helping to develop a plan to eliminate all pollution sources in the city at public and private expense

Problem Card #4

A report indicates that the coyote population has reached an all-time low in the United States.
Would you favor:

C Writing a letter voicing concern about the situation

O Making a financial contribution to an organization concerned with coyote preservation

N Taking no direct action but hoping that the coyote increases in population

S Taking no direct action and "caring less"

E Voting for legislation to discontinue the bounty paid for coyote pelts

Problem Card #5

As a part of a beautification project, the local city council has proposed that all existing and future over-head telephone lines be placed underground in the business district.
Would you favor:

C Placing all present and future wires underground for aesthetic reasons

O Placing all future wires underground, but allowing the present telephone wires to stay above the ground

N Placing all present and future telephone wires underground for economic reasons

S Permitting over-head telephone wires in the business district

E Allowing each private and public business to make their own decision about the telephone wires leading to the building

How To Use The Consequence Cards:

Some consequences of the alternative solutions will be presented on separate cards. For example, consequence #1 corresponds to problem card #1 and the accompanying solutions. Read each consequence card and then remove the corresponding set of solutions from the problem card envelope. Repeat the same procedure of ordering the solutions from top to bottom according to priority from the most favorable to the least favorable. When you have determined the best order, record the order of the letters and replace them in the problem card envelope. This second ordering may or may not be the same as the first ordering. Then go on to the next consequence card and repeat the same procedure for each.

Consequence Card #1

Natural and artificial wetlands serve to provide water storage, stream flow regulation, and flood prevention. They also provide a habitat for waterfowl and other wildlife. Reclaimed agricultural land is rich in nutrients and produces high crop yields. The draining of wetlands often lowers the water table in the surrounding area which affects other water users. Soil management techniques and hybrid seed has enabled farmers to produce higher yields per acre than ever before on some land. By expanding the cultivated land, the farmer will increase profits from the sale of crops next year.

Consequence Card #2

The construction of a lake of adequate size cannot avoid destroying specific plants valued by scientists and destroying the wilderness aspects of the area. The dam construction will mean an economic gain for the residents of the area because of increased tourist trade. By law, the decision to dam the area rests with the local people. By allowing the stream to remain free-flowing, the scenic and scientific values of the area will remain for the few, but will exclude the recreational desires of the majority. Wilderness areas and increased public recreational development are often considered incompatible uses for the same area. Relocation of the recreational development to another site involves increased financial expenditures, but it is possible.

Consequence Card #3

Heavy smog levels will cause damage to painted surfaces, stone buildings, women's nylons, plants, and other materials. The costs for reducing air pollution are high and often must come directly or indirectly from the consumer of specific products through higher prices and taxes and tax incentives for industry. To completely eliminate air pollution appears impossible until new modes of transportation, waste disposal, and generating electrical power are accepted by the public. Scientific evidence reveals an association between air pollution and certain human diseases. Heavy air pollution causes a "greenhouse" effect which allows sunlight to penetrate to the earth, but prevents the heat from escaping back into space.

Consequence Card #4

If the coyote population is considerably reduced or eliminated, rodent populations are likely to increase and become greater pests. Many farmers and ranchers believe that coyotes prey on certain domesticated and livestock animals causing them economic loses. The bounty system for predators such as the coyote, has been discontinued or lowered in many areas of the country because it proved to be ineffective. Protective legislation has been an effective means of saving some threatened wildlife species if the population does not fall below a critical level. Some scientists favor the preservation of all living things on the basis that science may discover that an organism is useful in ways yet unknown. It is difficult to prove that the extinction of certain wildlife species will seriously affect our civilization's prosperity over the long run.

Consequence Card #5

It is difficult to prove that putting all telephone lines underground will bring any economic gains to the business district. The costs of placing all telephone wires underground would be considerable and may involve a tax increase. However, costs for initially placing telephone wires underground are about equal to the costs of placing them above ground in most areas. The placing of all future wires underground would prevent the situation from becoming worse, but would not remove the existing overhead wires which prompted the beautification plan. Also, allowing individual businesses to decide whether or not they will place their telephone wires below ground may not produce the desired results of the beautification program.

8. Examining value indicators such as personal attitudes, beliefs, ideals, interests, and feelings in relation to personal actions.

Activity—

Do the exercise, "Finding Out About Environmental Attitudes, Beliefs, Interests and Feelings". What did you discover about the personal actions of others in your group? What did you discover about your personal actions? Select several personal actions and list your attitudes, beliefs, interests, and feelings related to each.

"Finding Out About Environmental Attitudes, Beliefs, Interests, and Feelings"

Directions: After each item below, fill in the name or names of people in this group that fit the descriptions. Try to use each person's name at least once.

Find someone who:

1. Usually picks up litter.
2. Usually refrains from picking wildflowers.
3. Has grown some of their own food.
4. Usually turns out the lights when leaving a room.
5. Fixes leaky faucets.
6. Turns down the thermostat during the night in winter.
7. Has planted a tree.
8. Keeps house plants.
9. Car pools when possible.
10. Has signed a petition expressing an environmental concern.
11. Has boycotted products of countries that have not acted responsibly toward the environment.
12. Sometimes rides a bike rather than a car.
13. Recycles some products.
14. Does not buy some products that are over packaged.
15. Has donated money for an environmental cause.
16. Reads articles about environmental issues.
17. Is a vegetarian for energy-saving reasons.
18. Heats with a wood stove.
19. Walks some places instead of driving.
20. Drives a car that gets good gas mileage.
21. Talks to others about using natural resources wisely.
22. Avoids trampling plants in the woods.
23. Builds fires in protected places.

24. Has written a letter to the editor to express an environmental viewpoint.
25. Teaches about caring for the environment.
26. Has weather stripped or insulated a room.
27. Avoids air conditioning on some days to save energy.
28. Washes dishes by hand rather than use a dishwasher.
29. Avoids foods with chemical additives.
30. Buys returnable beverage containers.
31. Takes short showers or baths to save energy.
32. Saves and uses scrap paper.
33. Avoids wasting left over foods.
34. Avoids putting more wood than needed on a fire.
35. Raises abandoned or injured birds.

9. Examining and evaluating the accomplishments of significant human models (i.e. Rachel Carson, John Muir, Theodore Roosevelt, etc.)

Activity--

Read more about John Muir and other people who demonstrated a concern for the environment. What are some traits that these "environmentalists" shared? How are you like some of these people? How are you not like them? How could you change your life to have more of the traits you admire in others?

John Muir - A Person Close to Nature

1. John Muir was happiest when he could share his love of nature with others. What is something that makes you happy when you share it?

2. John Muir collected plants and flowers and pressed them between two pieces of wood. Do you collect anything? If so, what?

3. When John Muir was a boy in Scotland, he decided that disobeying his parents and going to an old castle was more important to him than staying home and playing in his yard. Have you ever felt so strongly about something that you broke a rule?

4. John Muir won a prize for his inventions. He invented a machine to wake him up that told time, rang a bell in the morning, and even shook his bed. He also made a thermometer as tall as himself. He made a desk that opened and closed books so he could read faster. What is something you would like to invent? How would it be useful?

5. When John Muir was a young man, he was blinded by pieces of flying metal while working in a factory making wagon wheels. John was blind for many weeks. When he was able to see again, he believed that he had been given a second chance to see all the trees and flowers he had read about. If you knew you were going to lose your sight next week, what would you want to look at carefully so you could remember?

6. John Muir walked from Indiana to Florida with only a few clothes and a compass collecting plants along the way. Have you ever felt so strongly about something that you would walk many miles for it? What was it?

7. When John Muir walked from Indiana to Florida, he said, "I am wild and free again!" What is something that you like to do that makes you feel wild and free?

8. John Muir lived in a place called Yosemite Valley. A famous scientist said that the valley was made by great earthquakes. John Muir said that it was made by glaciers. The scientist laughed at Muir. A few years later Muir found evidence that the valley was really formed by glaciers. Have you ever had someone laugh at you because he thought you were wrong? How did it feel?

9. John Muir and his friends formed the Sierra Club to help save wild places. Have you ever belonged to a club or organization? What were some of your reasons for joining?

10. John Muir wrote, "We are all part of the wilderness, and the wilderness is part of us." How much of your thoughts and travels are related to the wilderness? With your pencil shade in the part of your life circle that is wilderness.

Information from JOHN MUIR by Glen Dines. New York: G. P. Putnam's Sons, 1974. Taken from Humanizing Environmental Education: A Guide For Leading Nature and Human Nature Activities by Clifford E. Knapp and Joel Goodman. American Camping Association, Martinsville, Indiana, 1981, p. 90.

10. Examining issues of authority and group consensus methods of arriving at moral principles and behavior.

Activity--

After participating in the "Eagle Ranch Dilemma" discuss the pros and cons of controlling personal behavior by authority methods (laws, ordinances, rules, etc.) and by group consensus methods in which people willingly agree on moral principles and behaviors.

Eagle Ranch Dilemma

There was a case in the federal courthouse in San Antonio, Texas, and the trial was that of the United States of America versus Andrew Allen, Lanny Leinweber, and "Buddy" Pape. All three men were being accused of conspiring to violate the Federal Bald Eagle Protection Act, as well as the Federal Airborne Hunting Act.

In his testimony Pape spoke emotionally of how the eagles were taking food out of his own mouth as well as that of his family. He recalled how last year in one lamb pasture he had 270 pregnant ewes. When they rounded up the lambs for docking, there were just 42 left. He insisted the known predators were wintering golden eagles and not the bobcats or coyotes. Pape also insisted that Texas sheep are important to the world's food supply, and that the eagles were taking food out of the mouths of needy children. Throughout the courtroom the lamb ranchers sat in silent approval and agreement.

A young helicopter pilot, Gerry Heintzelman, was called by the prosecution to give testimony. The story Heintzelman told was as follows: Andrew Allen, a Government Trapper, had hired Heintzelman to take his helicopter to Real County for an aerial hunt. Allen soon revealed that eagles were the target, not bobcats or coyotes. Both of them realized what they were doing was illegal. Heintzelman soon realized that he was involved with a group of local ranchers in aerial eagle shooting. He testified that on December 11, 1975, with Pape in the gunner's seat 16 eagles were killed, 14 were shot on the 12th, by the third day they had totalled 35 birds. On January 26th, 1976, Heintzelman was called for again and 25 eagles were gunned down. Heintzelman related how eagle shooting was a "big fun deal" in Real County. He recalled being angry because the local ranchers and their sons were amateur gunners in aerial killing, and they were forever on the verge of shooting through the roto blade.

The ranching community assembled in the courtroom was astonished that Heintzelman would be involved in the investigation. They simply sat there tight-lipped as they awaited the verdict of the jury.

What should the verdict of the jury be?

_____GUILTY

_____NOT GUILTY

_____ABSTAIN

Discussion Questions:

What is the conflict in the dilemma?

What are the FACTS of the dilemma? What are the ISSUES?

What VALUES are present in the dilemma?

What VALUES are in conflict? What interests are in conflict?

WHY did you choose guilty, not guilty, or abstain?

Explore "Buddy" Pape's reasoning: WHY would he think he did the right thing?

What were the REASONS behind Heintzelman's testimony?

If you were the prosecutor what three important questions would you ask "Buddy" Pape?

What are the REASONS behind conservation laws?

Why were so many ranchers present?

Exploration For Broader Meaning of the Dilemma:

Are there other areas where persons ignore laws and act on what they sense is right? Consider:

in government	in the church
in education	in the medical profession
in welfare	in business
in law	in science.

What are some implications of going beyond the law?

Does a person have the right to take the law in their own hands if it is for an apparent good? If it is a matter of conscience?

To raise, and to explore higher stage concerns:

What were other options to killing eagles?

Could a Government agency help?

Do eagles have a right to be protected?

Who grants rights? Who has the right to deny rights?

Should things in nature have standing? Why?

How can we talk of rights of animals, trees, rivers, etc., when a lot of human beings are without rights?

Who was responsible for the eagle killings?

Review the Discussion of the Previous Class:

Would anyone like to change their verdict after further consideration? Would anyone like to add or comment on yesterday's discussion?

Focus on Certain Issues of the Dilemma for further thought clarification:

1. Predation, perhaps like no other ecological subject, generates more heat than light among the scientific and lay community. What would be the reasons for such heated debate within the scientific community?

   What is the truth of the eagle as a lamb killer?

2. The U.S. Department of Agriculture has predator control methods such as Compound 1080 which was used on the coyote. Some chemical controls have been harmful to the local populations.

   Who has the right to kill predators?

   Who has the right to determine the methods to control predation? Consider hunting, DDT, destruction of eggs, other chemical controls, etc...

   Who researches predation problems?

3. Has the eagle become the "scapegoat" for the changes and troubles of the sheep and goat ranchers? Many ranchers view that their industry is being destroyed by predators. Should the ranchers include: bad range management, over-grazing, rising labor costs, and the growth and use of inexpensive synthetics which has depressed the mohair and wool markets?

4. Pape in his testimony kept inferring that Texas sheep were important to the world's food supply. Let's consider alternatives.

   a. the amount of grain that is needed to carry cattle and sheep through a Texas winter is phenomenal. Is it possible that the grain would feed more hungry people than the same grain translated into meat?

   b. the Federal Government is allocating huge amounts of funds to Conservation Programs. Nationwide huge amounts of monies are being spent to save endangered species. Would it be better to give money to food and health problems?

5. Most hunters consider themselves sportsmen/sportswomen. Is aerial hunting a sport? Are there more humane ways to hunt than others? Does everyone have a right to hunt?

6. There are numerous reasons for the "unnatural extinction" of species; predation; altering natural habitats for construction; the toxification of species by industrial society. Some scientists have stated that: "Endangered species are an early warning system to humanity. It is indicative of our biotic impoverishment."

   Is any life form worthless?

   What are the criteria for determining which life forms should continue to exist in our highly complex culture?

From a mimeographed paper, A Curriculum Guide for Moral Discussion and Environmental Issues author unknown, undated. pp. 6-11.

11. Listing and prioritizing standards for making decisions and examining conflicts among them.

Activity—

Discuss the following environmental problems and issues and make decisions about what you would do. Then make a list of all the values that you applied in making each decision. Prioritize these values and examine them for any possible conflicts.

1. Rezoning - You are being asked to vote on a proposal to rezone the town's only park for residential development. Your town has high taxes and the new residences would lower the taxes significantly. A park in the next town is available, if you want to use it. How will you vote?

2. Glass Walled Buildings - It has been proven that glass walled buildings waste heat in the winter and cost too much to cool in the summer. What should be done about a large glass walled building owned by a soap company in a town?

3. Power Lines - Your housing development is only 4 yrs. old. The telephone company is going to extend their services to a new section of the development. They are willing to put all existing lines underground with the new lines to beautify the landscaping. It will cost each home owner $90 for the service to be performed. Do you favor the underground lines or added above ground lines?

4. Bacon - Researchers claim eating too much bacon will cause canser. Would you continue to eat bacon and ignore the research?

5. Deer Hunt - Many conservation groups do not want a deer hunt in a National Wildlife Refuge. Even though there are more deer than the food supply can support, the group thinks it is cruel to hunt them, especially on a refuge. The groups suggest a feeding program rather than a hunt. What should be done?

6. Offshore Oil - We need oil and oil products. There is probably large amounts of oil beneath the ocean off the East Coast. The Federal Government would like the oil extracted. The governors of many Eastern states fear that their coastlines will be ruined. What should be done?

7. Blackbirds - Fourteen million blackbirds have become pests at a military base. They will be eradicated by spraying a fog of detergent which removes protective oils from the birds' feathers. With the oil gone, the birds would freeze to death. Do you agree with this method of eradicating the birds?

8. Abortion - Many pregnant women in a small town in India become convinced that they want abortions. They can't bear to see their newborns starve slowly because of a drought and food shortage. The local Catholic doctor won't perform the abortions. What should be done?

9. Solar Energy - We have the technology to use solar energy to heat buildings. Should the Federal Government subsidize home builders to encourage them to build homes that can be heated by the sun?

12. Identifying broad and basic moral principles to serve as a foundation for establishing rules or codes of behavior.

Activity—

Read the selection from "The Woodsman's Code" and list the underlying basic moral principles from which the Code might have been developed.

For example:

Using the wilderness for recreation should be done with a minimal impact on the ecosystem.

Woodsman's Code

Travelling

1. Use existing trails and portages and stay within their confines. Conduct a careful study of the environmental implications before blazing new trails.

2. Use switch backs in trails. Do not cut a new trail to save 50 metres.

3. Follow game trails where possible and when necessary rather than breaking new ones.

4. Wear lug soled footgear (footgear with pronounced ridges on the soles) only when absolutely necessary because this type of boot tends to disturb vegetation to a considerable degree and generally leads to unnecessary erosion.

Campsites and Shelters

5. Use existing campsites. Keep heavy use to a confined area (because of soil compaction).

6. Do not overstay. Do not expand the campsite.

7. Refrain from using natural materials for shelters, except in emergency situations.

8. Refrain from landscaping the campsite.

9. Use natural drainage. Do not dig trenches in delicate environments. Use a floored tent.

Fires

10. Use stoves where law and local regulations dictate; where there is a fire hazard; where serious danger to the ecosystem exists; where there is little or no firewood; and where the user wishes to have a minimal impact.

11. Keep fires small.

12. Use existing fire pits. If the area is untravelled, remove evidence of fire after use.

13. Where a fire pit is absent, dig to the mineral level of the soil, avoiding the burnable soil, roots and overhanging trees. Save sand to cover cold ashes.

14. Use only dead wood for the fire.

15. Burn to a white ash. Retrieve non burnables such as foil, tin cans, plastics, glass, etc.

16. Douse the fire thoroughly. Stir ashes and the area surrounding the ashes. Douse again. Eliminate fire scars where possible.

Human Waste

17. Use existing outhouses.

18. Bury human waste in a small, shallow latrine (15-20 cm deep — 6" - 8") 35 metres from open water.

19. Use single ply white toilet paper and bury completely.

Other Waste

20. What is carried in must also be carried out. Burn it, bash it, bag it, bring it back.

21. Wash dishes, clothes and yourself in a dish pan, not in the lake or stream. Rinse away from open water. Dump dishwater in a hole located at least 150 ft. from the shoreline (150 ft. is the minimum disposal distance).

22. Use biodegradable soap (Sunlight type).

From "The Woodsman's Code: How To Behave In The Wilderness". The Conservation Council of Ontario, 45 Charles Street East Toronto, Ontario M4Y 1S2

13. Identifying value conflicts in everyday, life situations.

Activity—

Examine and issue a problem using an Environmental Impact Statement.

Preparing an Environmental Impact Statement

The Environmental Policy Act of 1969 officially established the practice of evaluating the effects of man's changes on the environment. An environmental impact statement (E.I.S.) is a report which examines a proposed project in detail. A project which may significantly affect the quality of the environment (such as mining in a National Forest) needs study. Mining brings benefits as well as costs to man. The purpose for preparing an E.I.S. is to weigh the values of a project against the damage it may do. Damage can include spoiling the scenery, killing animals on the endangered list, or any other harmful result. The evaluation of a project should be done by many professionals including ecologists, engineers, social scientists, and planners. After examining a completed E.I.S., governmental officials decide whether or not to allow the project to be carried out.

Usually a series of steps takes place in the preparation of an E.I.S.:

1. The objective of the project is stated.

2. The technology necessary to accomplish the objective is studied.

3. One or more alternative ways to achieve the objective are proposed.

4. The characteristics of the existing environment (before the proposed project) are described.

5. The benefits and costs in money are itemized for each alternative way of meeting the objective.

6. The environmental impact of each alternative is predicted.

7. The separate actions involved in the project are listed and their effects upon various parts of the environment are determined.

8. A summary and list of recommendations are made at the end of the report.

Environmental impact considers how much the project will affect different parts of the environment. It also considers how important this change will be. Usually, the "how much" and the "how important" questions are expressed in numbers as well as in writing. A proposed mining project in a National Forest can have an effect on an endangered species that might be rated "5" on a scale of 1 to 10. If the importance of this animal is considered great, the evaluators might assign a "10". One way to express these two parts of environmental impact on an endangered species is "5/10."

Select a current environmental issue which involves a specific land use project. Have the students prepare an E.I.S. and make a decision about whether or not the project should be allowed.

For further information about Environmental Impact Statements:

A Procedure for Evaluating Environmental Impact by Luna B. Leopold, et. al. Geological Survey Circular 645 Washington, D.C. 1971 (free) Small quantities are available from Distribution Section, U.S. Geological Survey, 1200 South Eads Street, Arlington, Virginia 22202

Environmental Impact Assessment: A Procedure by Lloyd V. Stever. Pottstown, Pennsylvania: Technical Publications Section, Sanders and Thomas, Inc. 1973. Available from the Public Relations Department of STV, Inc., Consulting Engineers, First Federal Building, Pottstown, Pennsylvania 19464

From Priority One Environment: Teacher's Guide - Open Lands and Wildlife, by Clifford E. Knapp. Pollution Control Education Center, Union, N.J. n.d. pp. 24-25.

14. Listing reasons for making specific moral choices and listening to the reasons listed by others.

Activity---

Consider each of the following environmental issues and write a phrase or sentence about where you stand. Then list the reasons for making those particular choices. If you are undecided or do not choose to take a position, list your reasons for feeling this way. When you have completed you list, listen to the reasons listed by others. Compare and contrast these lists. Discuss how you came to hold these particular values.

1. Using "hard" pesticides instead of less persistent ones.
2. Building nuclear power plants instead of alternate energy sources.
3. Developing prime farmland for housing instead of agricultural production.
4. Removing coal by strip mining instead of leaving it in the ground.
5. Limiting each family to two natural born children.
6. Hunting in a wildlife refuge.
7. Requiring the sale of returnable beverage containers instead of using throw away containers.
8. Conducting litter pick ups instead of leaving the litter there.
9. Car pooling when possible instead of driving alone.
10. Boycotting products that are over packaged instead of buying them.

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Compiled by C. E. Knapp

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