

5. Sketch the major components of the hydrologic cycle.
  6. Differentiate between the gaseous and sedimentary biogeochemical cycles.
- B. The student will:
1. Trace the path of matter on several of the resource classifications as previously listed. (i.e. iron ore to steel to rust).
  2. Demonstrate by a flow diagram that energy in the environment is uni-directional
  3. Describe, using an analysis of a local stable eco-system, that the natural trend in nature is toward equilibrium of material. Differentiate between dynamic and static equilibrium.
  4. Using an example of a hypothetical stable system, describe the possible consequences upon the stability of the system caused by man's interference.
- C. The student will:
1. Identify the function of the various components of a sample eco-system.
  2. Illustrate in a simple sketch the cyclical nature of a selected vital natural resource.
  3. Forecast in written form the consequences of the inclusion or exclusion of a single component in a simple eco-system.
  4. Explain how the value of natural resources fluctuates with supply and demand.
  5. List two or three examples of interaction among several eco-systems.
- D. The student will:
1. List five examples of how man has had an effect on the earth's resources.
  2. Describe three to four resources management problems in a locally defined area.
  3. Recommend two possible alternative solutions to a resource management problem in a locally defined area. Be sure to include political, economic, sociological and ecological complications.
  4. Participate in community resource management planning or action.
  5. Project current resource management trends in his community into the future and describe the effects.
  6. Demonstrate how a resource management practice in his community affects the world's systems.

POPULATION DYNAMICS  
Alternative #1

I. OVERVIEW

The world's population, which was approximately 3.5 billion in 1969, increases about 2% every year. If it continues at this rate, the world population will double by the year 2000. Our present population increases by 180,000 daily - or more than 65 million a year. Half of the population now living on earth has been born since the end of World War II (1945).

The magnitude of this problem arising from this unprecedented multiplication of the human species has stirred the concern of people everywhere. The expansion in world populations, projected for the remainder of this century, is staggering. The impending disaster, foretold by these statistics, decries the immediate concern of the world's approximate 3.6 billion.

II. CONCEPTS

- A. Man must control his own numbers or face the consequences of overpopulation.
- B. In order to understand the consequences of over-population; man must examine the history which has led to the crisis.
- C. Solutions to the over-population crisis are complicated and demand interdisciplinary evaluation and solution.
- D. The cause and effect relationship between man and his environment must be replaced by a dialogue which represents an understanding of his obligation and responsibility to succeeding generations.

III. STUDENT OBJECTIVES

- A. The student will:
  - 1. Determine, using data published by the United Nations through one of its agencies, the amount of space each human being in the world needs to carry out the basic human functions. Report orally on this.
  - 2. Describe, four consequences of over-population.
  - 3. Express individual attitude on birth control. Defend this attitude in view of population in advanced countries.
  - 4. State views on abortion, euthanasia, infanticide and war as methods of population control.

5. Describe five non-renewable natural resources and detail what can be done to prevent them.
  6. Verbally sketch a likely day's activities of a person living in the inner city in the year 2000. Compare that to the probable life style of a person in a New York slum area today.
  7. Keep a written record for one school day. Recording emotional states, physiological condition and environmental factors. Take special note of the number of people in each situation.
- B. The student will:
1. Explain the role of each of these in contributing to the population explosion:
    - a. agricultural revolution
    - b. industrial revolution
    - c. medical revolution
    - d. technological revolution
 Include for each at least 3 ways each has contributed.
  2. Write a two page essay on the ways in which Malthus said population would be controlled.
  3. Analyze each of Malthus' alternatives and either support or negate it with examples for each as to whether they would work for present day society.
  4. Analyze the role of the "Judeo-Christian" tradition in contributing to the population.
  5. Review the action of religious and political bodies with regard to the population problem over the past ten years.
- C. The student will:
1. List any number of ways in which an individual can directly or indirectly influence population growth.
  2. Explain how and why an adjustment of economic factors might effect the population growth rate.
  3. Explain how our present socio-economic system contributes to both an increase and a decrease in our birth rate.
  4. Suggest at least two pieces of legislation that would lead to a decrease in population growth.
  5. Discuss the biological, social, psychological, economic, and political consequence that will result if the population continues at its present rate.
- D. The student will:
1. Take a census (survey) in a five block area of his own neighborhood to discover how many families have:
    - a. considered the idea of a population crisis.
    - b. are in favor of the use of some form of birth control method.
    - c. have not considered birth control methods for religious reasons.

- d. if individual were to use or have used some form of birth control method; indicate which of the following.
1. vasectomy
  2. IUD
  3. Pill
  4. contraceptive
  5. sterilization
  6. rythum method
  7. abstinence
  8. legalizing suicide

Finally; make an evaluation chart indicating the results of the survey which can be compared with those of other students in the class.

POPULATION DYNAMICS  
Alternative #2

I. OVERVIEW

The population problem which arises from the unprecedented multiplication of the human species has stirred the concern of people everywhere. The expansion in world populations, projected for the remainder of this century, is staggering. The impending disaster, foretold by these statistics decries the immediate concern of the world's billions.

II. CONCEPTS

- A. During the last two centuries the world's population has grown at an unprecedented rate.
- B. Population of some countries is growing at a faster rate than others.
- C. High population density causes environmental problems.
- D. An acceptable quality of life is dependent upon a proper balance between population and support systems.
- E. Individual concern and action are mandatory for population control.

III. STUDENT OBJECTIVES

- A. The student will:
  - 1. Construct a graph of world population against years starting about 8000 B.C.
  - 2. Discuss the two phases of population growth since 1750.
  - 3. Discuss in small groups, why the less developed areas of the world have surpassed the more highly developed areas in population growth since 1900.
  - 4. List and discuss at least four reasons for the accelerated growth of world population during the last two centuries.
  - 5. List and discuss the three kinds of population dynamics in present day society:
- B. The student will:
  - 1. Compare the birth and death rates of four countries in different areas of the world.
  - 2. Discuss the characteristics of those societies which have a high birth and death rate.
  - 3. Discuss the characteristics of those societies which have high birth but declining death rates.
  - 4. Discuss the characteristics of those societies which have a declining birth rate as well as a declining death rate.

5. Discuss in small groups whether a high population density necessarily indicates over-population.

C. The student will:

1. List five environmental problems brought about by high population density.
2. Compare an area of high population density with an area of low population density and list three advantages and three disadvantages of each.
3. List and explain three main factors which brought about population density.
4. Describe how the natural environment has been changed in a selected urban area by high population density.
5. Discuss in small groups solutions to the environmental problems caused by the high population density.

D. The student will:

1. Discuss in class concepts of an "acceptable quality of life".
2. Identify different types of support systems required for a city of 100,000 population.
3. Write a one page paper discussing the possible effects of population growth exceeding one of its support systems.
4. Identify the relationships between one of the support systems in his community and the natural environment.
5. Develop with the class an innovative solution to maintaining an acceptable balance between the population and one of its support systems in his community.
6. Construct a table showing the relationships between population density and need for certain (to be identified by the instructor) collective support systems.
7. Voluntarily seek to participate in the development of adequate and efficient support systems as well as the preservation of the natural environment.

E. The student will:

1. Discuss in small groups the need for and the means of educating citizens about the problems of population control.
2. List and discuss three factors involved in planning the size of a family.
3. Compare the average family size in the U.S. 100 years ago with the average family size today and discuss the reasons for the differences.
4. Identify two local or national organizations which deal with population control and describe their programs.
5. Discuss in a small group how the individual himself can help control population.

POPULATION DYNAMICS  
Alternative #3

I. OVERVIEW

Population is a dynamic phenomena. This dynamism is brought about by both controlled and uncontrolled fluctuations of interacting populations of living organisms. Human population pressure will require a reassessment of past and current beliefs and methods of population control.

II. CONCEPTS

- A. The condition of population is never static.
- B. Population fluctuations are the result of both controlled and uncontrolled processes.
- C. There is an interdependency between all living organisms.
- D. Population pressures necessitate a reassessment of current value systems or past population ideas.
- E. Methods of population control are both natural and man devised.

III. STUDENT OBJECTIVES

- A. The student will:
  - 1. Construct a graph showing the change in world population from year 1 A.D. to the year 2000 A.D.
  - 2. List and discuss each effect of the four influences on population levels. i.e. food, disease, natural disasters, war.
- B. The student will:
  - 1. Give an example of how man has successfully controlled his own population growth on a local basis.
  - 2. Discuss the influence, if any, that organized religion has upon population fluctuations.
  - 3. Assess the success of a particular method of man in his attempts to control his numbers in terms of his intended objective.
  - 4. Cite how man's entry into a natural predator pest relationship affects population fluctuation.

- D. The student will:
1. Define a specific past idea of family size and tell how it has led to the population pressures of today.
  2. Select two examples from a list of extinct species provided by the instructor and cite the effects on its community.
  3. Defend or refute the proposition of zero population growth.
- E. The student will:
1. Identify two possible legislative approaches to population control.
  2. List and give at least one advantage and one disadvantage of each of the following four methods of birth control; contraceptive, abortion, abstinence, homosexuality.
  3. List and give at least one advantage and one disadvantage of each of the following four methods of birth control; euthanasia, abortion, infanticide, war.

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT A</u></p> <p>The conditions of population are never static.</p> <p><u>OBJECTIVES:</u></p> <ol style="list-style-type: none"> <li>1. The student will construct a graph showing the change in world population from year 1 A.D. to the year 2000 A.D.</li> </ol>	<ol style="list-style-type: none"> <li>1. Data for graph will come from library research by student.</li> <li>2. Data for graph could come from instructor through lecture, film or other classroom activity.</li> <li>3. Individually or in small groups, the students will collect population data for small blocks of time. Then students will share population data and factors affecting population during that period of time with the class.</li> </ol>	<ol style="list-style-type: none"> <li>1) The student will graph the change in world population from year 1 A.D. to year 2000 A.D.</li> </ol>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT A (continued)</u></p> <p><u>OBJECTIVE:</u></p> <p>2. The student will list and discuss the effect of five influences on population levels.</p>	<p>1. The students will make casual observations of a fruit fly population with a closed food supply for one month. This will be done before the topic is discussed.</p> <p>2. See Strategy A.1.c.</p> <p>3. Audio-visual aids.</p>	<p>1) List and discuss the effect of five influences on population levels.</p> <p>2) The student will orally discuss five effects of influences on population levels.</p> <p>3) The student will write a term paper discussing the effect of five influences on population levels.</p>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT B</u> Population fluctuations are both controlled and uncontrolled.</p> <p><u>OBJECTIVE:</u></p> <ol style="list-style-type: none"> <li>The student will give an example of how man has historically attempted to control his own population growth on a local basis.</li> <li>Discuss the influence, if any, that organized religion has upon population fluctuations.</li> <li>Assess the success of a particular method of man in his attempts to control his numbers in terms of his intended objective.</li> </ol>	<ol style="list-style-type: none"> <li>A panel discussion including a minister, a ZPG member, a sociologist, a mother, and a doctor. The panel will have a list of topics to be discussed.</li> <li>The students will survey population groups within their community from their approved classroom, developed questionnaire to find out community attitudes toward population control.</li> <li>Given some provocative statements concerning population control, the students will discuss in small groups, and present a consensus to the class.</li> </ol>	<ol style="list-style-type: none"> <li>The teacher will evaluate students' questionnaire which they have filled out from a community survey.</li> <li>Evaluation of student participation in small group discussion.</li> <li>A written example of historical control of population.</li> <li>The student will answer an essay question upon the influence of organized religion upon population fluctuations.</li> <li>The student will select a method of birth control, collect material on this method, and write a paper assessing its success.</li> </ol>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT B</u> Population fluctuations are both controlled and uncontrolled.</p> <p><u>OBJECTIVE:</u></p> <p>4. Show how man's entry into a natural predator-prey relationship affects population fluctuation.</p>	<p>1. Have each student bring a poster to class illustrating:</p> <ul style="list-style-type: none"> <li>a. a predator-prey relation</li> <li>b. man's entry</li> <li>c. result to predator-prey relationship.</li> </ul> <p>2. Use of audio-visuals.</p> <p>3. The class will discuss how insecticide use in underdeveloped countries has increased food production, and how this has affected population.</p>	<p>1) Evaluation of a student constructed poster.</p> <p>2) Allow each student to develop a means of illustrating man's entry into a predator-prey relationship and allow his peers to evaluate his effectiveness.</p> <p>3) In a written question, discuss man's entry into a predator-prey relationship.</p>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT C:</u> There is an interdependency between all living organisms.</p> <p><u>OBJECTIVES:</u></p> <ol style="list-style-type: none"> <li>1. The student will sketch the "S" and "J" growth curves and explain the meaning of each region of the curve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Given population data limited space and food, (food supply is constant) the student will graph the population growth curve ("S" curve).</li> <li>2. Given population data, limited space and food (food supply is not continuous or by-products of individuals make environment uninhabitable) the student will graph the population growth curve ("J" curve).</li> <li>3. Lecture.</li> </ol>	<ol style="list-style-type: none"> <li>1) On a written exam, the student will sketch the "S" and "J" growth curves and explain the meaning of each region of the curve.</li> </ol>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT C:</u> There is an interdependency between all living organisms.</p> <p><u>OBJECTIVES:</u></p> <p>2. With data supplied by the instructor, graph the population versus time curve and state some conclusions as to the overall population growth.</p>	<p>1. The instructor will describe a population versus time graph, illustrate with some examples and ask the students to discuss possible results.</p> <p>2. See C.1.a. and C.1.b.</p>	<p>1) The student will, on a written test, graph the population versus time curve and state some conclusions as to overall population growth.</p> <p>2) The student will devise an experiment (i.e. fruit flies) and keep a lab journal showing population versus time growth for this closed system.</p>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p>3. Give an example and explain the cyclic nature of one population as it interacts with another population (i.e. lynx and hare).</p> <p>4. Relate "carrying capacity" to food supply. List an example of an area in which food supply has been exceeded.</p>	<p>1. Allow the class to divide into small groups, select interacting populations (man-animal, animal, animal-plant, etc.) and present their findings to the class in a fashion they decide is most effective.</p> <p>2. See B.4.a. with expansion to all interactions.</p> <p>3. Divide the class into three groups            1. 1/3 will project future population growth (controlled and uncontrolled).            2. 1/3 will project available food supplies under present land usage.            3. 1/3 will compare population versus food supply and list possible solutions.</p>	<p>1) Evaluation of student interaction within a small group discussion.</p> <p>2) The evaluation of a student generated illustration (slide, tape, snapshots, diagrams, etc.) of the cyclic nature of one population with another population.</p> <p>3) A written discussion of the "carrying capacity" of the food supply as related to one species.</p> <p>4) Written discussion of cyclic nature of one population as it interacts with another population.</p>



POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>Concept D.</u> Population pressures necessitate a reassessment of current value systems or past population ideas.</p> <p><u>Objectives:</u></p> <ol style="list-style-type: none"> <li>1. Define a specific past family size and tell how it has led to the population pressures of today.</li> <li>2. See next page.</li> <li>3. Defend or refute the proposition of zero population growth.</li> </ol>	<ol style="list-style-type: none"> <li>1. Have each student project from his own family size, the population of the world increase due to his family in 10 generations.               <ol style="list-style-type: none"> <li>a. Assume each child has some number of children as parents.</li> <li>b. Length of one generation is mother's age at birth of middle child.</li> <li>c. Assume all parents die at birth of new generation (actually some parents will live more than one generation and some children will die before off-spring are born).</li> </ol> </li> <li>2. See B(1,2,3) a</li> <li>3. See C (3,4) c.</li> </ol>	<ol style="list-style-type: none"> <li>1) Have the student on a written test select from a list a past idea of family size and discuss how it has led to the population pressures of today.</li> <li>2) A written defense or refutation of the proposition of zero population growth.</li> <li>3) Evaluation of group within a role-play of the aspects of zero population growth</li> </ol>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT D</u></p> <p>Population pressures necessitate a reassessment of current value systems or past population ideas.</p> <p>2. Select 2 examples from a list of extinct species provided by the instructor and cite the effects on its community.</p>	<p>1. Use of audio-visual</p> <p>2. The use of an outside speaker (i.e. ecologist, State Fish and Game Personnel, etc.).</p> <p>3. Have a portion of the class to research and present a discussion of American extinct and endangered species of wildlife</p>	<p>1) Select two examples from a list of extinct species provided by the instructor and cite the effects on its community.</p>

POPULATION DYNAMICS

CONCEPT	STRATEGY	EVALUATION
<p><u>CONCEPT E</u></p> <p>Methods of population control are both natural and man devised.</p> <p><u>OBJECTIVES:</u></p> <ol style="list-style-type: none"> <li>1. Suggest two possible legislative approaches to population control.</li> <li>2. List and give at least one advantage and disadvantage of each of the following methods of birth control; contraceptive, abortion, abstinence, homosexuality, euthanasia, infanticide, war.</li> </ol>	<ol style="list-style-type: none"> <li>1. See B (1, 2, 3) a.</li> <li>2. The student will collect information on methods of population control.</li> <li>3. The students will set up an information center or small group discussion for persons in the community on methods of population control. This could be done through already established community organizations.</li> </ol>	<ol style="list-style-type: none"> <li>1) On a written test, suggest two possible legislative approaches to population control.</li> <li>2) List and give, on a written test, at least one advantage and disadvantage of contraceptives, abortion, abstinence, homosexuality, euthanasia, infanticide, and war.</li> </ol>

POPULATION DYNAMICS  
Alternative #4

I. OVERVIEW

The self-regulating phenomenon of population growth maintains species and effectively utilizes the available resources in the environment.

The alteration of the natural cyclic mechanics of population regulation have been altered by man's expanding technical abilities.

Awareness of the dynamics of population development and maintenance is an essential factor in understanding the environment, the cause of contemporary social, economic, political and ecological problems within the total environment.

"The more you have the more you get"

II. CONCEPTS

- A. The regulation of natural population is determined by the capacity of the support system; i.e. any and all processes which tend to check the natural increases.
- B. Man has effectively raised the carrying capacity of his environment by technological applications. This activity has had substantial impact on the population of non-human species as well as his own environmental quality.
- C. Man has circumvented natural environmental resistance factors and, to a larger extent, now controls his own survival abilities at the genetic level.
- D. Human population control is absolutely essential on a world wide basis. There must also be a more equitable distribution of the human population.

III. STUDENT OBJECTIVES

- A. The student will:
  1. Describe how a limit of population growth is reached under natural conditions. (i.e. number of barnacles on a piling is limited by available space, sea level and tide level).

2. Research an animal population and report on the change in population size over time and the factors involved in the change. (i.e. the passenger pigeon, the horse).
  3. Identify the population control factors using a highly defined closed life support system.
  4. Demonstrate an ability to handle the basic mathematic relation to exponential natural reproductive increase by making population projections from appropriate data and graphically display such computations.
  5. List all of the components within an eco-system which may effect the dimensions of animal population.
  6. List five reasons why a rat population in a specific open dumping area will be self-limiting.
- B. The student will:
1. Explain why it is necessary to control the slaughter of wild fur-bearing animals that historically have been used to cloth man.
  2. List several examples of man's technological manipulation of his environment in regard to food production, construction practices, transportation, fishing techniques, disease reduction and reduction of birth rates.
  3. Demonstrate the population fluctuation of pest insect life when pesticides have been used to control them and when genetic resistance to the chemicals occurs. Also relate human population size between 1940 to 1970 in underdeveloped countries where DDT has been applied.
  4. Collect data from the locality which will assess the relation between human population change and the change in population of five selected species including plant and animal, (domestic and wild), occupying the same area over the past fifty years.
  5. Identify two species where population has decreased and two whose population has increased due directly to man's increasing population in the area.
  6. Investigate the effects of temperature alterations on a tank of "tropical fish" when life support parameters have been established. He shall then examine the change in temperature of water bodies (data provided to students by industrial processes). The student should then be asked to generalize, based on the data as to the effect of environmental alterations on animal population.
- C. The student will:
1. Project written evidence that modern medical advances have:

- a. been used to extend the line of genetically abnormal humans.
  - b. has developed techniques which have led to increased genetic control over food crops in both developed and underdeveloped nations.
  2. Research and prepare a "position paper" on data assertions and predictions relating to genetic alterations in the human species.
  3. List undesirable genetic conditions which should be eliminated from the human gene pool.
- D. The student will:
1. List five ways in which the World Health Organization can be effective in helping all nations in regard to population control.
  2. Using general climate control conditions, prepare an ideal population map showing present densities and desirable (absolute) densities and define criteria to control these densities.
  3. Evaluate five human population projections for the next 5000 years with respect to:
    - a. basic premise stated or implied therein.
    - b. personal judgement as to most probable outcome.
    - c. rank order the premises in terms of their impact.
  4. Construct a map which demonstrates the center of population concentration in the U.S. or in a state and evaluate the potential environmental problems in the area of water, air, solid waste management, transportation, housing and educational needs.
  5. Assuming an ungovernable population expansion seems certain to degrade the quality of life in the foreseeable future, try to estimate which aspects of the quality of life will suffer first and offer evidence of this belief.

#### IV. RESOURCE MATERIALS

1. Guest lecturers (experts in specific fields)
2. Audio-visual (films, tapes, TV, slides)
3. Student hand-outs (census data, etc.)

POPULATION DYNAMICS  
Alternative #5

I. OVERVIEW

The magnitude of the problem arising from an unprecedented multiplication of the human species has stirred the concern of people everywhere. The expansion in world populations, projected for the remainder of this century is staggering. The impending disaster, foretold by these statistics, decries the immediate concern of the world's approximately 3.6 billion population.

II. CONCEPTS

- A. The population of the world is increasing exponentially as a result of accelerating birth rates and declining death rates.
- B. There are many variables influencing birth rates and death rates.
- C. Many of our environmental and sociological problems are a result of over population. If the population continues to expand at its present rate, the environment will not be able to support life on this planet.
- D. Population control is necessary and there are several alternative methods to accomplish this.

III. STUDENT OBJECTIVES

- A. The student will:
  - 1. Plot a graph showing the growth of the world's population from the birth of Christ to the year 2050.
  - 2. Discuss the effects of the agricultural industrial revolutions on the world's population growth.
- B. The student will:
  - 1. Outline the principal sociological variables influencing birth rates.
  - 2. Construct a population pyramid for your state.
- C. The student will:
  - 1. List several social and environmental problems which would be alleviated by achieving zero population growth.
  - 2. Evaluate the Malthus Theory as it relates to today's environmental problems.
  - 3. List several possibilities for increasing the world's food supply in the future.

- D. The student will construct a bar graph showing the relative efficiency of four methods of birth control.

IV. RESOURCE MATERIALS

1. Audio tape
2. Video tape
3. Video cassettes
4. Filmstrips
5. Three dimensional models
6. Photographs
7. Special Graphics
8. Charts
9. Drawings
10. Diagrams
11. Real people (expert testimony)
12. Slides
13. Overhead projectors
14. Transparencies
15. Chromo key
16. Video electronic special effects

URBANIZATION: THE LIVING COMMUNITY  
Alternative #1

I. OVERVIEW

The population magnet may create over-crowding, a depletion of resources, waste and sewage management problems, air and water pollution, proliferation of disease, and most importantly the diminishing of the human spirit.

II. CONCEPTS

- A. The growth of cities has occurred in response to man's needs.
- B. The continuing concentration of people in urban areas with its concomitant deterioration of living standards necessitates immediate consideration and concern for finding methods of improving these conditions.
- C. New philosophies regarding urban development have emerged because of the increasing urban crises.

III. STUDENT OBJECTIVES

- A. The student will:
  - 1. Write the United Nations' definition of the term urban.
  - 2. Explain what the following have contributed to the growth of our cities.
    - a. agricultural revolution
    - b. the steam engine and the industrial revolution
    - c. farm mechanization
    - d. cultural opportunities
- B. The student will:
  - 1. Describe the results of eliminating slums (ghettos) by replacement with mixed income housing developments.
  - 2. Describe what happens to individuals required to move or relocate.
  - 3. Differentiate between a master plan and a sector plan.
  - 4. Name three areas within the U.S. where megalopolis are developing.
  - 5. Evaluate the interrelationships and shared services and facilities of the urban-suburban community.
  - 6. Give an example of a regional plan.
  - 7. State the approximate acres of farmland absorbed annually by cities and highways.

- C. The student will:
1. Research to identify the present trends in urban development.
  2. Using the concepts gained through literary research as well as his personal innovations to develop a plan or design for an urban development.

IV. RESOURCE MATERIALS

1. Audio tape
2. Video tape
3. Video cassettes
4. Film clips
5. Film strips
6. Three dimensional models
7. Photographs
8. Special graphics
9. Charts
10. Drawings
11. Diagrams
12. Real people (expert testimony)
13. Slides
14. Overhead projectors
15. Transparencies
16. Chromo key
17. Video electronic special effects

URBAN ENVIRONMENT  
Group Originated

I. OVERVIEW

Historically cities were developed by man in response to his needs. Technological and physiographic features contributed heavily to their location. An urban environment may be viewed as a metabolic entity and this urbanization has affected the life style of human groups therein. For optimum development of a healthy urban environment, urban planning and management is essential.

II. CONCEPTS

- A. Historically cities were developed by man in response to his needs. Their location was influenced by physiographic features and technology.
- B. Urbanization has affected the life style of human groups.
- C. The city may be viewed as a metabolic entity.
- D. Urban planning is an on-going process.

III. STUDENT OBJECTIVES

- A. The student will:
  - 1. List at least five physiographic features that may play a part in determining urban location and discuss their role in city location.
  - 2. Outline the role of transportation in urban development.
  - 3. Trace the use of cities in connection with plant domestication.
- B. The student will:
  - 1. Identify at least five current issues that illustrate diffusion of responsibility typical in urban living.
  - 2. Illustrate a specific example of how urban living creates a sense of anonymity.
  - 3. Defend the view that urban living places a greater stress on the environment than rural living.
  - 4. List ways urbanization affects the territorial imperative of man.
  - 5. List three factors that lead to a feeling of individual security in a city.

6. Illustrate by example how difficult it is for the individual to become involved in the politics of urban life.
- C. The student will:
1. Because the city may be viewed as a metabolic entity, list five input requirements that are needed for the life of the city and also five outputs of the city.
  2. Using the analogy of a city as a metabolic entity, trace an input (i.e. wood) through an urban system (or systems) to its output.
  3. Identify three urban systems that parallel each of three systems of the human body and explain why he chose that system (communication-nervous system).
  4. Write an essay on the effects of the cities' input requirements and consequent outputs on the surrounding rural area and/or the rural areas influence on the city.
- D. The student will:
1. Describe an on-going process of planning.
  2. Select a local problem area and investigate its past and present planning.
  3. Explain what is meant by "design with nature".
  4. Select a plan considered in objective two and compare it to one of your own in terms of the environment.
  5. Evaluate the various approaches to the planning processes (ex. regional or local planning).

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>A. Historically cities were developed by man in response to his needs. Their location was influenced by physiographic features and technology.</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>1. List at least 5 physiographic features that may play a part in determining urban location and discuss their role in city location.</li> </ol>	<ol style="list-style-type: none"> <li>1. Case study of a given community; Example: Miami</li> <li>2. Give general "requirements" for community location, for example, resources, transportation, climate. Given a blank map, indicate probable community locations.</li> <li>3. Use an attitude survey incorporating concepts.</li> <li>4. Simulation game specifying roles to students -- Where should a plant be located in a given area -- nationally. Cite specific location alternatives.</li> <li>5. Lecture introduction to present the problem.</li> <li>6. Use outside resource person to present the problem.</li> </ol>	<ol style="list-style-type: none"> <li>1) Oral Report</li> <li>2) Teacher conducted test</li> <li>3) If case study done, keep log to be checked.</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept A (Continued)</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>Outline the role of transportation in the development of cities.</li> </ol>	<ol style="list-style-type: none"> <li>Make a traffic count at a major intersection and pay attention to peak hours and kinds of traffic (trucks, private vehicles, etc.)</li> <li>Use film on transportation.</li> <li>Visit a local agency such as Rapid Transit Authority, Chamber of Commerce &amp; determine from them the vote at transportation in city development.</li> </ol>	<ol style="list-style-type: none"> <li>Oral presentation</li> <li>Written report</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept A (Continued)</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>Trace the growth of the domestication of plants in the development of cities.</li> </ol>	<ol style="list-style-type: none"> <li>Research an article on food and agriculture, such as Mangelsdoff's "Wheat" from <u>Scientific American</u>.</li> <li>Make a trip to the grocery store and identify on a map the source of various fresh produce products.</li> <li>Pre-test survey to determine the variety of foods available to the urban dweller.</li> </ol>	<ol style="list-style-type: none"> <li>Written report</li> <li>Oral report</li> <li>Teacher constructed sequential test.</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>B. Urbanization has affected the life style of human groups.</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>1. Identify 5 current issues that illustrate diffusion of responsibility typical of urban living.</li> </ol>	<ol style="list-style-type: none"> <li>1. Examine a city directory or telephone book the number of government agencies that govern urban affairs with possible overlapping authority.</li> <li>2. Write a brief case history of a current issue in urban life and focus attention on the varying points of view of parties involved on the issue.</li> <li>3. Graphically illustrate how a city tax dollar is distributed in terms of service purchased. Also, its origin and ultimate distribution.</li> </ol>	<ol style="list-style-type: none"> <li>1) Teacher constructed test</li> <li>2) Student constructed test</li> <li>3) Observation using criteria sheet</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept B (Continued)</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>2. Illustrate on a specific example how urban living creates a sense of anonymity.</li> </ol>	<ol style="list-style-type: none"> <li>1. Write a paragraph about your neighbor telling occupation, name, number of children and other non-private circumstances.</li> <li>2. List at least three things a person may do when in a strange urban environment that helps him to obtain a sense of belonging.</li> <li>3. Itemize the various sources of numbers used to represent an individual (tax number, savings account, credit card, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>1) Creative expression (song, poem, etc.)</li> <li>2) Written report</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept B (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <p>3. Defend or refute the view that urban living places a greater stress on the environment than rural living.</p>	<p>1. Compile statistics to support this view. Make use of government agencies.</p> <p>2. Compare air sampling of air taken from a busy traffic artery to that of an open pasture or field.</p> <p>3. Based on 5.4 lbs. per capita for solid waste, calculate the tonnage of daily solid waste for the population of your city.</p>	<p>1) Group report</p> <p>2) Term paper</p> <p>3) Journal on log kept on environmental studies</p>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept B (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <p>4. Support or refute the view that urbanization affects the territorial imperative of man.</p>	<p>1. Readings supplied by the class instructor to set the stage for a debate.</p> <p>2. Do a term paper.</p> <p>3. Two outside resource speakers to take opposing sides of the question.</p>	

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept B (Continued)</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <p>5. List three factors that lead to a feeling of individual security in a city.</p>	<p>1. Lecture on group dynamics and discussion</p> <p>2. Film on "interpersonal relationships."</p> <p>3. From a city directory determine the number and kind of agencies designated to help urban dwellers obtain a sense of security.</p> <p>4. Resource speaker. Example: A foreign student in the country; new student in community, to tell how he developed security.</p>	<p>1) Written report</p> <p>2) Oral report</p> <p>3) Teacher Test</p>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept B (Continued)</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <p>6. Illustrate by example how difficult it is for the individual to become involved in the politics of urban life.</p>	<p>1. Conduct a random sample street interview to obtain the extent to which people are <u>not</u> involved in urban politics and the reasons why.</p> <p>2. Obtain from the Registrar the number of citizens who are registered to vote and compare this data to the number who are qualified and not registered.</p> <p>3. Determine by a study of past political events the number and kind of decisions that were made in a given span of time (2 Yrs.) by voter participation.</p>	<p>1) Observation using a criteria for assessment.</p> <p>2) Written report</p> <p>3) Oral report</p>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept C</p> <p>The city may be viewed as a metabolic entity.</p> <p><u>OBJECTIVES:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>1. Demonstrate how the city may be viewed as a metabolic entity by listing 5 input requirements that are needed for the life of the city and 5 outputs of the city.</li> </ol>	<ol style="list-style-type: none"> <li>1. Lecture on energy needs of the city.</li> <li>2. Survey three urban industries and determine what raw materials are needed from outside the city.</li> <li>3. Given the hypothetical condition, "that all outside transportation is cut off from a city, "determine what functions of the city would experience difficulties first.</li> </ol>	<ol style="list-style-type: none"> <li>1) Journal on log on functions of city.</li> <li>2) Oral report</li> <li>3) Written report</li> <li>4) Specific homework assignments</li> </ol>

N ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept C (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>Trace an output (i.e., wood) through an urban system or systems of its output, drawing on the analogy of a city as a metabolic entity.</li> </ol>	<ol style="list-style-type: none"> <li>Film on use of raw materials.</li> <li>Fantasy Trip: Imagine yourself as a cup of iron ore and trace the events that might occur as you evolve to a final output product.</li> <li>Resource person such as City Planner or City Manager</li> </ol>	<ol style="list-style-type: none"> <li>Teacher-made text</li> <li>Diagram or sketch</li> <li>Oral presentation</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept C (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <p>3. Identify 3 urban systems that parallel each of 3 systems of the human body and explain why he chose that system (communications -- nervous system).</p>	<p>1. Study a filmstrip on excretory system of the human body and make the proper analogy.</p> <p>2. Game playing for analogy. Name body organs and systems to let students draw urban parallels.</p> <p>3. Construct a chart showing adverse effects on the human body by the introduction of foreign elements and draw urban analogies for similar introductions.</p>	<p>1) Diagram on sketch</p> <p>2) Oral presentation</p> <p>3) Written report</p> <p>4) Observation using criteria for assessment</p>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept C (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <p>4 Discuss in writing the effects of the cities' input requirements and consequent outputs on the surrounding rural area and/or the rural areas influence on the city.</p>	<ol style="list-style-type: none"> <li>1. Research on urbanization</li> <li>2. Lecture and discussion</li> <li>3. Document statistically from public records the city's dependency upon raw materials (or other input) from non-urban areas.</li> <li>4. Written report</li> </ol>	<ol style="list-style-type: none"> <li>1) Written report</li> <li>2) Teacher made test</li> <li>3) Team paper</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept D</p> <p>Urban planning is an on-going process.</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>Describe an on-going process of planning.</li> </ol>	<ol style="list-style-type: none"> <li>Lecture on urban planning and development</li> <li>Read historical development of cities.</li> <li>Resource speaker (City Planner)</li> <li>Film, "Cities of the Future".</li> <li>Research on Philosophy of Florida's Disneyworld.</li> </ol>	<ol style="list-style-type: none"> <li>Oral report</li> <li>Teacher test</li> <li>Student teacher conference</li> <li>Group report</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept D (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>2. (Given background information) Select a local problem and investigate its past and present planning.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discussion oriented toward sources to obtain background information.</li> <li>2. Case study on the subject of planning.</li> <li>3. Resource speakers - City Planner.</li> </ol>	

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept D (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>3. What is meant by "Design with Nature."</p>	<ol style="list-style-type: none"> <li>1. Take a field trip through your city and document instances where nature has been infringed upon by man's urban design.</li> <li>2. Construct a hypothetical situation whereby nature is properly respected so as to create a balance between urban design and nature.</li> <li>3. In class discussion: Draw examples from students from various backgrounds as to how nature has either been respected or abused in urban design.</li> <li>4. Research at least 4 different geographic regions of the U.S. and determine how geography poses both obstacles and opportunity in urban design.</li> </ol>	<ol style="list-style-type: none"> <li>1) Keep log or journal</li> <li>2) Oral report</li> <li>3) Written report</li> <li>4) Observation using criteria for assessment</li> </ol>

URBAN ENVIRONMENT

CONCEPT	STRATEGY	EVALUATION
<p>Concept D (Continued)</p> <p><u>OBJECTIVE:</u></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>4. Be able to evaluate the various approaches to the planning processes (Example: Regional or local planning.)</li> </ol>	<ol style="list-style-type: none"> <li>1. Outside speaker - City Planner.</li> <li>2. Hypothetical situations posed by instructor to criticize.</li> <li>3. Construct a presentation illustrating a good plan.</li> </ol>	

DOCUMENT RESUME

ED 071 866

SE 015 325

AUTHOR Healy, Mary K.; Root, Phyllis  
TITLE A Beginning.  
PUB DATE 72  
NOTE 46p.; Prepared for the Sierra Club Conference on  
Education for Environmental Awareness

EDRS PRICE MF-\$0.65 HC-\$3.29

DESCRIPTORS \*Annotated Bibliographies; \*Ecology; Elementary  
Grades; Environmental Education; Learning Activities;  
\*Perception; Reference Materials; \*Resource Guides;  
Secondary Grades

ABSTRACT

Selected for their focus on man, acting to know, preserve and improve his environment, the items noted in this booklet furnish a resource base for developing an environmental ethic. Introductory statements enumerate values, understandings, and realizations to be developed and sample activities that may be conducted or adapted for grades K-12. Resources, the major component, provides an annotated listing of films, filmstrips, printed material (books, pamphlets, charts, kits, newsletters and workbooks), periodicals, records, games, and organizations. Concluding the work are commitments one can make to practice conservation and help improve his environment. (BL)

U.S. DEPARTMENT OF HEALTH,  
EDUCATION & WELFARE  
OFFICE OF EDUCATION  
THIS DOCUMENT HAS BEEN REPRO-  
DUCED EXACTLY AS RECEIVED FROM  
THE PERSON OR ORGANIZATION ORIG-  
INATING IT. POINTS OF VIEW OR OPIN-  
IONS STATED DO NOT NECESSARILY  
REPRESENT OFFICIAL OFFICE OF EDU-  
CATION POSITION OR POLICY

ED 071866

# A BEGINNING

SEO/S 385

Prepared for the  
Sierra Club Conference  
on Education for Environmental Awareness

*Before this century is done, there will be an evolution in our values and the values of human society, not because man has become more civilized but because, on a blighted earth, he will have no choice. This evolution — actually a revolution whose violence will depend on the violence with which it is met — must aim at an order of things that treats man and his habitat with respect.*

*—Peter Matthiessen, Everglades*

# WHAT'S INSIDE ???

**1 Objectives**

**2 Activities**

**3 Resources**

Films

Filmstrips

Printed Materials

\$18 Environmental Bookshelf

Literature

A Variety

Periodicals

Records

Games

Organizations

**WHAT'S INSIDE** is NOT a definitive survey of available conservation education materials.

**IT IS** a selection of materials we've seen or used — materials which have validity in any program which focuses on **MAN**, acting to know, preserve and improve his **ENVIRONMENT**.

**SELECTED AND ANNOTATED BY**

Mary K. Healy, Humanities Teacher  
Del Mar School, Tiburon

Phyllis Root, Coordinator, Multi-Media Center  
Reedland Woods School, Tiburon

**GRAPHICS BY**

Joan Peterson, Art Specialist  
Reed Union School District, Tiburon

# **OBJECTIVES**

**values**

**understandings**

**realizations**

**1**

The student will develop a growing realization that mankind cannot continue in his old, traditional ways of dealing with his world. These attitudes in the past have led, in part, to the present environmental crisis.

**2**

The student will become aware of the kinds of things which have happened to our environment, such as the destruction of natural resources, the pollution of the atmosphere, the demise of natural places that give "birth" to ecological sub-groups (estuaries, woodlands, waterways, etc.), the overcrowding of our urban areas, and the sure, gradual loss of scenic beauty.

**3**

The student will begin to understand that conservation is the responsibility of everybody — a responsibility to be shared and practiced day in and day out throughout life; that this is a world-wide necessity which transcends political boundaries and man-made laws.

**4**

The student will begin to realize that the world is constantly changing, for better or for worse, and how it changes will depend upon the values and actions of mankind.

**5**

The student will come to understand that many times it is necessary to preserve things simply for their esthetic beauty, rather than allow that beauty to vanish in order for man to gain economically.

**6**

The student will be encouraged to carry forth, as far as possible, the never-ending study of how and why all living things are bound up together in a countless, and often subtle, series of inter-relationships (ecology).

**7**

The student will be encouraged to develop an attitude of hopefulness that the world can be made better through the improvement of our ecological climate; he will try to dispel the predictions of doom and will attempt to see through the irresponsible attitudes and actions of some groups and individuals.

Adapted from the Objectives of  
a Conservation Course of Study  
DeWitt E. Hogle  
Mt. View, California

# ACTIVITIES

Possible class activities are numerous, bound only by the scope of an individual teacher's imagination. Below are just a few which can be adapted and used in the appropriate grade level, K-12.

new environmental laws in junior and senior high school classes, which could be submitted to the state legislature. Students could do research and debate the merits of the proposed law in class. At lower grade levels, students might devise and implement regulations regarding the immediate school environment.

a school-based environmental conservation fair. Involve the school and community in constructing exhibits, planning demonstrations, making posters, securing speakers, selecting films and preparing dramatic presentations concerning local environmental problems and their possible solutions.

an endangered species in class and prepare a full-scale advertising campaign (posters, radio and T.V. spot commercials, brief 8mm. films, displays) which will acquaint the public with the situation and the steps they might take to lessen the danger.

a map of your locality. Have each student X the environmental problems he sees in the area on his copy. Then have the students, individually or in groups, choose one to further research. Encourage them to propose feasible solutions to the problem and then actively seek means of having their solutions implemented by community officials.

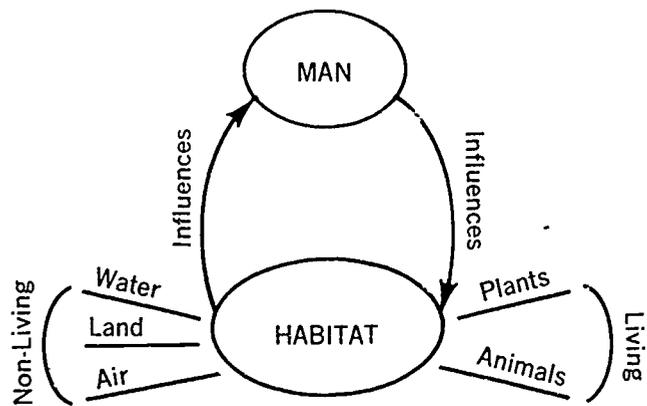
either a class or school bulletin board of "eco-pornography", which is described in **The Environmental Handbook** as those ads in which major industrial concerns loudly and cleverly claim to be solving some facet of the environmental crisis when actually they are misinterpreting the problem or merely clouding their guilt in rhetoric. Have students research and write up refutations of the ads for display with them.

an environmental-conservation song writing contest in your school. Tape the winning songs and play them over the local p.a. system. Offer them to local radio and T.V. stations for broadcast.

a multi-media show highlighting a local environmental problem and suggesting possible solutions. Have students use some combination of the following: slides, on-the-spot cassette tapes, 8mm films, records, light shows. A suggested simple subject to begin: "The Two Faces of ..... School".

a monthly class newsletter "Notes on the Environment", featuring an endangered animal of the month, an interesting project or experiment for the students to try, a cross-word puzzle which includes ecological terms, local environmental news, vocabulary words, student drawings or cartoons, a listing of up-coming television programs and a listing of current environmental action programs in the area.

an inter-disciplinary course (science, literature, social studies, composition) using the following concept model as a focus:



For example, Urbanization in San Francisco might be a focus, with each of the disciplines planning concurrent activities for students studying some facet of the concept.

a brief, conservation-oriented literature unit. Use the following two short stories.

"THE SNAKE" by Erwin Kraus, found in *Explication and Review B*, a sourcebook for teachers which accompanies *Counterpoint In Literature*, the 8th grade California State Literature text. It was originally published by Scott, Foresman and Company, Glenview, Illinois 60025.

"THE LIFE AND DEATH OF A WESTERN GLADIATOR" by Charles G. Finney, found in *An Outlook Through Literature*, a 9th grade literature text published by Scott, Foresman and Company, Glenview, Illinois 60025

and the poem:

"THE SNAKE" by D. H. Lawrence found in *Counterpoint in Literature*, described above.

These stories and the poem should be read and discussed primarily for the differing attitudes toward nature which the various characters and authors express.

your school an environmental laboratory. Growing in popularity all over the country is the school-site or nearby ecological preserve. Below are listed some current materials which describe, in detail, ways of designing and using these areas:

**Man and His Environment** is an introduction to using Environmental Study Areas which is published by the Association of Classroom Teachers of the National Education Association. This book explains a different kind of environmental learning experience that makes imaginative use of both the cultural and natural worlds as they combine to make up the study areas. The areas, together with the study guide materials developed for the area and the regular school curriculum, help students relate to their world. The NESA guidelines provide the framework which each local area can adapt to its own needs. Available at \$1.75 from Publications-Sales Section, National Education Association, 1201 Sixteenth St., N.W., Washington, D.C. 20036.

**The Community School Site**, a laboratory for learning, is published by the U.S. Department of Agriculture, Soil Conservation Service, in March 1970. This booklet is about adapting school grounds to a teaching environment. The first part explains how to organize your plans and get started while the second part outlines possible activities for many different areas of the curriculum. Available from the U.S. Department of Agriculture, Soil Conservation Service, 2020 Milvia Street, Berkeley, California 94704.

**Outdoor Education on YOUR School Grounds** is an action approach to better teaching, a Manual for elementary and junior high school teachers by Norman F. Marsh. No jargon here, just 83 pages of activities and projects with clear plans and diagrams drawn when necessary. An excellent resource for teachers in all areas. Available free, one per school, from The Department of Education, Office of Conservation, Sacramento, California 95814.

**Conservation in Miniature, A Low Budget Environmental Program With a High Educational Return**, was written by Ralph I. Turner. The procedures outlined in this book will enable a school district to reproduce completely an innovative, low-cost science conservation program. Also, individual teachers will find techniques, ideas and lesson plans structured on the "discovery" approach. Available free, one per school, from The Department of Education, Office of Conservation, Sacramento, California 95814.

# RESOURCES

# films films films

## SELECTED FILMS FOR ENVIRONMENTAL EDUCATION

annotated by Dr. Bob O'Brien  
San Diego State College

Films are a virtual necessity for effective environmental education. No conservationist ever becomes convinced of the necessity of preserving a landscape say, without experiencing it in some personal way. The printed word can sometimes be effective this way, but a feeling for nature and wildlife, an abhorrence of pollution and an appreciation of a scenic landscape can best be transmitted visually.

There are a wide range of conservation films available, but the purpose here is to offer the teacher a sampling of several types of films and to indicate the quality of films available in the field. *A Critical Index of Films and Filmstrips in Conservation*, Conservation Foundation, 30 East 40th St., N.Y. offers a film bibliography and a valuable rating of films by grade level.

1. **THE BALD EAGLE** — Color (C) — 33 minutes long (m) — National Audubon Society, 1130 - 5th Ave., New York, N.Y. 10028. (Rental)

This is a beautiful film, offering long, unhurried closeup of eagles hunting, nesting and growing to maturity. It is a "soft" conservation film, designed to create interest in the bald eagle rather than dwelling on the dangers which the bird faces. A knowledgeable teacher, tapping a ready-made concern in the survival of our national bird, can then describe the accidental shootings, habitat destruction and pesticides which imperil the bird.

2. **CALIFORNIA — THREE IMAGES** — C — 15m — American Institute of Architects — Northern California Chapter, 254 Sutter St., San Francisco. (Free)

This slide presentation obtains its effectiveness by contrasting the good and the bad in our use of the environment in California. A teacher can get ideas here, perhaps leading to a personal presentation using a similar technique. Nothing is as effective as a presentation which can draw on local familiarity with a subject.

3. **EVERGLADES** — C -- 28m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

The entire environmental crisis often seems to come to focus in a single area. The Everglades of southern Florida is one of the world's great homes for wildlife and man seems to be determined to try and destroy the area with everything in his power. Flood control and reclamation projects, a mammoth jetport, urban development, pesticides and poaching, all threaten this area, which might ultimately stand as a monument of man's ability to destroy . . . or to care.

4. **GARBAGE EXPLOSION** — C — 16m — Extension Media Center, University of California, Berkeley, California 94720. (Rental)

The solution to the growing Everests of garbage this nation produces daily lies within the conscience of every individual who fills the trash can at his own door. Should we consume less, permit only bio-degradable packaging, permit only recyclable packaging, or leave it up to the city with sanitary fill, composting and incineration? The film doesn't answer all these questions but offers an introduction to the problems of waste disposal, which can serve as a takeoff for classroom discussion and action programs.

5. **THE GIFTS** — C — 30m — Modern Talking Picture Service, 16 Spear St., San Francisco 94105. (Free)

We did nothing to earn our life-giving gifts of clean water, pure air and virgin land. But in the last two centuries we have squandered our birthright and scarred its beauty. This film is an appeal to Americans to recognize our heritage and recall our special pride in restoring the country to what it once was and what it can be again.

6. **TROUBLED WATERS** — C — 28m — U.S. Senate, Public Works Committee, Washington, D.C. (Free)

A film on the subject similar to the above.

**films films films**

# films films films

- 7. GLEN CANYON** — C — 26m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

Glen Canyon is a particularly distressing film for it reminds us of what might have been, had it not been for man's indifference to his environment. Glen Canyon of the Colorado was a natural treasure carved over the millenniums but damned in months. The film, using a unique arrangement of slides, visits the canyon before and after the filling of Lake Powell. It teaches a bitter but essential lesson.

- 8. TWO YOSEMITES** — C — 10m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

A film on the subject similar to the above. The tragic destruction of Yosemite's twin valley, Hetch-Hetchy, is followed by one of the country's earliest conservation battles.

- 9. GRAND CANYON** — C — 26m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

Grand Canyon was spared the fate of Glen Canyon after conservation organizations and thousands of individuals exerted extreme pressure on Congress to rescind the plans to build two dams in the canyon. A part of that pressure was instigated by this film. Many people were familiar with the Grand Canyon from the rim but only a few from the river, where damage from the dams would be felt. The effort was so successful, paradoxically, that a severe overcrowding problem is developing as thousands discover the river trip through the Grand Canyon each year.

- 10. WILDERNESS RIVER TRAIL** (Dinosaur National Monument) — C — 28m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

A film on the subject similar to the above.

- 11. MARSHLAND IS NOT WASTELAND** — C — 14m — National Audubon Society, 1130 · 5th Ave., New York, N.Y. 10028. (Rental)

That we consider one of Nature's most productive areas, the tidal marsh, as fit only for garbage dumps, industrial fill or subdivisions is a good indicator of how we managed to get into our present environmental mess. Who in the Conservation movement has not been involved, probably lately, in trying to protect some "worthless" lagoon or estuary or tidal flat from the bulldozer? This film does an excellent job of pointing out the value of marshes as food-producing areas and nursery grounds for mollusks and commercially important fish, for sea birds and migratory waterfowl, and for open space, beauty and passive recreation.

- 12. THE POND AND THE CITY** — C — 16½m — Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

A film on the subject similar to the above.

- 13. MULTIPLY AND SUBDUCE THE EARTH** — C — 60m — Indiana University, Audio-Visual Center, Bloomington, Indiana 47401. (Rental)

Is it possible for man to live with nature and not destroy it, to enjoy a good life and still leave the earth as vital and enriched as he found it? Ian McHarg thinks so and offers his ecology-based planning proposals as practical, sensible solutions. It is a film you wish every planning commissioner, city councilman, and public official would see, and after viewing it yourself, maybe you will have incentive enough to see that the message will, with effort, get through to them.

- 14. NO ROOM FOR WILDERNESS** — C — 26m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

A film on the subject similar to the above.

- 15. POPULATION ECOLOGY** — C — 19m — Encyclopedia Britannica, 2494 Teagarden St., San Leandro, California 94577. (Rental)

We will never solve our environmental problems without coming to grips with overpopulation. And the most crucial step in stabilizing population is convincing people that overpopulation exists. This population film offers an effective tool to meet this goal.

**films films films**

- 16. PAVE IT AND PAINT IT GREEN** — C — 27m — Extension Media Center, University of California, Berkeley, California 94720. (Rental)

Convincing a person that a road, or a store or any of the comforts of home can be undesirable under certain conditions is a hard point to make. Showing bad development is the best way and this film goes all the way visually by using no narration or commentary at all. If you tire of seeing all those traffic jams and parking lots when a sweep of the camera would reveal the loveliness of Yosemite, remember that only by awareness can we renovate the blighted landscape being shown.

- 17. THE REDWOODS** — C — 27m — Sierra Club — Available through Association Films, 25358 Cypress Ave., Hayward, California 94544. (Free)

An Academy Award winner, this film helped create the Redwood National Park. That the park is much smaller than it should have been and that unrestrained logging on watersheds above the park is threatening what presumably had been saved, keeps this film timely. It is a breathtakingly beautiful film which has achieved a rightful place in any conservation film library.

We seem unconvinced that there is anything more to forest conservation than reseeding and preventing forest fires. The forests of the U.S., many of them, are still being raped and even the agencies established to prevent such things are either unwilling or unable to take action.

- 18. WASTED WOODS** — C 15m — and **REDWOODS — SAVED?** — C — 3½m — Sierra Club — Available through Association Films, 25338 Cypress Ave., Hayward, California 94544. (Free)

Both are films which complete the half-story told by forest products industries.

- 19. SLOW GUILLOTINE** — C — 50m — NBC

This succeeds as a film about air pollution because it documents the problem, cuts through the sugar pills being handed out by Detroit and their apologists and tells the viewer that he can do something about it. The flood of letters reaching the TV station and other influential people, following its first showing in Southern California, was so great that a nationwide follow-up was deemed advisable! Jack Lemmon does an outstanding job as narrator.

**films films films**

Other air pollution films:

A. **POISONED AIR** — C — 50m — Extension Media Center, University of Calif., Berkeley 94720. (Rental)

B. **ILL WINDS ON A SUNNY DAY** — C — 30m — U.S. Senate, Special Committee on Air Pollution, Washington, D.C. (Free)

C. **THE RUNAROUND** — C — 17½m — National TB & Respiratory Disease Association. (Free)

**20. TIME FOR MAN** — C — 50m — The Ealing Corporation, 2225 Massachusetts Cambridge, Massachusetts 02140. (Rental)

A provocative and ambitious film, produced by the American Museum of Natural History, which provides a vignette of man's position in the environment. Life styles of animals and humans are examined and the question is introduced: can man learn to live with nature, or is he frozen into a way of life that can lead only to disaster?

**21. A WONDERFUL BIRD WAS THE PELICAN** — C — 26m — North American Films, 4440 Lakeside Drive, Burbank, California 91505. (Rental)

Is there anyone who still doesn't understand what is happening to our wildlife as the result of pesticides and other chemical poisons, and what might eventually happen to us? The message is so crucial that repetitiveness is no problem.

**22. POISONS, PESTS AND PEOPLE** — B&W — 60m — National Film Board of Canada, 44 Montgomery St., San Francisco, California. (Rental)

A near-classic on chemical pollutants.

**films films films**

# filmstrips filmstrips

## (Grades K-2)

Lifelike situations involving animals and children demonstrate the value of good conservation practices and the dangers of carelessness. The filmstrips introduce the basic concepts of forestry, land erosion and animal preservation.

1. **Sonny Squirrel and the Pine Trees**
2. **The Deer and the Haystack**
3. **A Picnic for Dick and his Friends**
4. **The Lamb and the Bluebells**
5. **Susan and the Forest Fire**
6. **The Muddy Raindrops**

Set of 6 captioned filmstrips, \$27.00 from SVE, Inc., 1345 Diversey Parkway, Chicago, Illinois 60614.

## (Grades 4, 5, 6)

These four filmstrips emphasize the importance of conservation by demonstrating the inter-relationships in nature:

1. **"The Cycle of Nature"** — Explains the dependence of the various branches of nature upon each other.
2. **"The Balance of Nature"** — Describes the wildlife community and tells how it is preserved through the maintenance of the balance of nature.
3. **"The Four Seasons"** — Describes how the wildlife community and the human community are affected by many of the same things.
4. **"Conservation"** — Describes how natural resources are destroyed through reckless or careless use.

A teacher's manual explains classroom projects and activities which compliment the content of each filmstrip. Available through: Universal Education & Visual Arts, 221 Park Avenue South, New York, New York 10003. Also: Eye Gate House, Inc., 146-01 Archer Avenue, Jamaica, New York 11435.

# filmstrips filmstrips

## (Grades 6-9)

This up-to-date analysis of the importance of conservation of natural resources explains the causes of problems and some possible solutions:

1. Soil Conservation Today
2. Forest Conservation Today
3. Water Conservation Today
4. Wildlife Conservation Today
5. Mineral Conservation Today
6. Urban Conservation Today
7. Land Conservation Today

Set of 7 Filmstrips, 4 Records and 7 Teachers' Guides for \$49.00. Available from SVE, Inc., 1345 Diversey Parkway, Chicago, Illinois 60614.

## (Grades 4-12)

A good introduction, with excellent pictures, to many current conservation problems.

1. Nature of Crisis
2. Atmospheric Pollution
3. Land Pollution
4. Freshwater Pollution
5. Marine Pollution
6. Pollution Control

A set of 6: #70W3800 for \$40.00 from: Ward's Natural Science Establishment, Post Office Box 1749, Monterey, California or One set only available free, on loan from: Sierra Club, Angeles Chapter, Conservation Education Committee, Call: (212) 780-1087.

**(Grades 7-12)**

Developed to help acquaint young people with the use and abuse of the natural environment of the U.S., this series should stimulate discussion of the pollution problem. It does not provide an answer but should lead to meaningful research by which students can discover the extent of our pollution problem. They should also discover what part the government, the private citizen and industry can play in correcting the problem.

1. An Overview
2. Atlantic Coastal Plain
3. Appalachian Highland and Piedmont
4. The Great Central Plain
5. Mississippi River System
6. Rocky Mountain — Great Basin
7. The Pacific Coast
8. Interdependent People
9. Niagara: River with the Wandering Waterfall (Part I)
10. Niagara: Wandering Waterfall (Part II)

Complete set of 10 color filmstrips with 5 Cassette Teach-A-Tapes and teacher's manual for \$87.50 or: Complete set of 10 filmstrips with 5 records and teacher's manual for \$85.00 from Eye Gate House, Inc., 146-01 Archer Avenue, Jamaica, N.Y. 11435.

# filmstrips filmstrips

**(Grades 8-12)**

This excellent series gets at man's attitudes and value-priorities which have caused today's ecological disasters. The excellent, contemporary photography is realistic and the narration poses many questions for class discussions.

1. What is Ecology?
2. What is Pollution?
3. What is Air Pollution?
4. The Automobile Beyond Air Pollution
5. Prosperity = Pollution

Five filmstrips, five records, five short teacher's guides. \$49.75 from Multi-Media Productions, Inc., 580 College Avenue, Palo Alto, California 94306.

**(Grades 6-12)**

This set is a real find — a complete conservation unit in itself! It explores the present state of water, air and land in this country. The set contains 3 filmstrips, "Water for Tomorrow", "Air for Tomorrow" and "Land for Tomorrow", records, transparencies and overlays, a student booklet and a comprehensive teacher's guide, including an up-to-date bibliography. Also included in the teacher's guide are plans for a culminating class game concerning a hypothetical water, air or land situation.

3 filmstrips, 3 records, 3 student booklets, 3 teachers' guides, K.D.I. Instructional Systems, Inc. Columbus, Ohio 43220.

**(Grades 8-12)**

Students examine actions and proposals by public and private institutions for meeting current ecological crises. The series stresses that individual values and activities must be changed to improve the quality of life.

2 filmstrips, discussion guides and records 35.00  
2 filmstrips, discussion guides and cassettes 39.00

from: Guidance Associates, Pleasantville, New York 10570

# filmstrips filmstrips

**(Grades 7-12)**

This set investigates the despoliation and imbalance within the environment caused by both man and nature. Six basic ecosystems have been selected as focal points to study.

1. Upland Forest
2. Lowland Forest
3. Marshes
4. Grasslands
5. Streams and Ponds
6. Tidal Zone

Complete set of 6 captioned color filmstrips with teacher's manual: \$35.00  
from: Eye Gate House Inc., 146-01 Archer Avenue, Jamaica, N.Y. 11435.

**(Grades 9-12)**

Can man who created a brave new world, then turned upon himself to despoil it, rise to become the saviour of his own environment? This urgent question is explored in two major filmstrip sets of five filmstrips and three records each:

**SET I ECOLOGY AND ENVIRONMENT**

- "Is There Life on Earth"
- "The Ocean of Air"
- "Water — Clear and Otherwise"
- "Of Food and Land"
- "Energy Applied"

**SET II MAN AND NATURE**

- "Population — The Numbers Game"
- "Concrete Habitat"
- "The Busy-Body"
- "Unthinking Man"
- "Man: the Builder"

Each set of 5 sound/color filmstrips and 3 records is \$59.00. AVI Associates, 825 Third Avenue, New York, N.Y. 10022.

**(Grades 9-12)**

"In wildness I sense the miracle of life and beside it our scientific accomplishments fade to trivia" says Charles A. Lindbergh as he guides students through nature as he sees it. He describes the frontier woodlands his own father knew and his years as aviator and observer of virgin wilderness. With him, students consider the threat of technology to unspoiled lands and resources.

**1 filmstrip, discussion guide and 1 record \$18.00**

**1 filmstrip, discussion guide and 1 cassette \$20.00**

from: Guidance Associates, Pleasantville, New York 10570.

**filmstrips filmstrips**

**(Grades 9-12)**

Students review the ugly and tragic death of Lake Erie, the Santa Barbara oil disaster and other current problems to document the potentially devastating impact of air, water and noise pollution on life in the U.S. Comments from Glenn Seaborg, Chairman, A.E.C., Senator Gaylord Nelson, former Secretary of the Interior, Stewart Udall and scientist Barry Commoner.

**Discussion guide, 2 filmstrips and 2 records — \$35.00**

**Discussion guide, 2 filmstrips and 2 cassettes — \$39.00**

from: Guidance Associates, Pleasantville, New York 10570.

**(Grades 9-12)**

Winner of American Film Festival Honors in 1969, Part I of this series explores the reasons for the population explosion and all effects it has had. Part II examines methods for controlling population growth. Students see efforts to develop fish-based foods and miracle grain crops and consider the work of the U.N. in this area.

**2 filmstrips, discussion guides and 2 records \$35.00**

**2 filmstrips, discussion guides and 2 cassettes \$39.00**

from: Guidance Associates, Pleasantville, New York 10570.



# Printed Materials

## \$18.00 ENVIRONMENTAL BOOKSHELF

Leopold, Aldo. **A Sand County Almanac.** Sierra Club/Ballantine Books. 95c.

Aldo Leopold, one of this country's most famous natural historians, eloquently describes the joy and beauty found in a style of life that protects the environment. Included is his classic essay on the need for an ecological ethic.

Swatek, Paul. **The User's Guide to the Protection of the Environment.** Ballantine Books. \$1.25.

Finally, an **everyday** action book for environmentally conscious people. The author describes the decisions we can make which will improve or deteriorate our environment. Specifically, he describes products by brand names and discusses those which are ecologically safe. Besides its obvious usefulness in the home, it is also an appropriate resource for class discussions.

Shepard, Paul, and Daniel McKinley. **The Subversive Science.** Houghton Mifflin. \$5.95.

This is one of the most meaningful and diverse collections of environmental writings to date. Paul Shepard introduces it with a succinct and insightful essay on man's relationship to his environment. The book's latitude can be gauged by the main subject headings: "Man as Population," "The Environmental Encounter," "Men and Other Organisms," "Men in Ecosystems," "Ethos, Ecos, and Ethics"

Ehrlich, Dr. Paul R. **The Population Bomb.** Ballantine Books. 95c.

The dominant problem in all our personal, national and international planning is overpopulation, according to Dr. Ehrlich. He clearly describes the dimensions of the crisis in all its aspects and provides a realistic evaluation of the options still remaining to us.

Rienow, Robert and Lenna Train. **Moment in the Sun.** Sierra Club/Ballantine Books. 95c.

Subtitled "A Report on the Deteriorating Quality of the American Environment," this angry report thoroughly documents man's accelerating destruction of his own habitat. Item by item, the Rienows present the ways in which we have ignored ecological principles and abused our environment under the pressures of over-population and a creed of exploitation. The last chapter, "Prolonging Our Moment in the Sun", offers a carefully considered suggestion for bringing us into equilibrium with our environment.

Marx, Wesley. **The Frail Ocean.** Sierra Club/Ballantine Books. 95c.

A fine companion volume to Rachel Carson's **Silent Spring**, this stunning, angry report will grow in importance with each new ocean disaster.

Russell, Terry and Renny. **On the Loose.** Sierra Club/Ballantine Books. \$3.95.

In this unusual, highly personal book, Terry and Renny Russell share with the reader their insights gained while exploring the natural world — "the corners that were spared" — as Terry calls it. Brilliant photographs chronicle their journeys and, in addition to their text, are quotes from such writers as Joyce, Thoreau, Shaw and Leopold.

Carson, Rachel. **Silent Spring.** Fawcett Crest. 95c.

In this contemporary classic in ecological literature, Rachel Carson describes man's alarming and indiscriminate use of synthetic pesticides and their effect on water quality, soil, plants, birds, and fish. **Saturday Review** hailed it as "a devastating attack on human carelessness, greed and irresponsibility."

Dasmann, Ray. **The Destruction of California.** Macmillan. \$1.50.

The tragic story of a state bent on environmental suicide is graphically told and possible actions to avert the crisis are described.

An excellent annotated bibliography all teachers might note:

**Conservation Education: A Selected Bibliography**, compiled by Joan Carvajal and Martha E. Munzer, for the Conservation Education Association. Order from The Interstate Printers and Publishers, Inc., Danville, Illinois.

Who knows definitively how and where our values are shaped? Surely they are shaped by many forces — home, school, friends and experiences are some. Through books, many different value systems may be explored. The few books selected below present, implicitly or explicitly, the values of writers acutely aware of their environment. They are lovers of the natural world they live in. Read some of these books, and, best of all, share them with children by reading selected parts aloud.

Eisley, Loren. **The Immense Journey.** Vintage.

Naturalist-writer Eisley shares his reflections on our evolutionary journey through time. Pervading the book is his respect for all manner of living things — perhaps the most basic ecological ethic of all.

Stegner, Wallace. **All the Little Live Things.** Signet.

This very contemporary novel explores a most important aspect of the ecological crisis — the clash of various personal values in respect to the environment. Set in a suburban area of California, Stegner's protagonists struggle to cope with the destructive elements in our society.

**ECOLOGY KITS** (Grades 9 through adult). These game kits cover many different ecological areas.

1. "Why Are Leaves Green" is about the unique ability of plants to use light to make their own food.
2. "Life in the Water" is about the tiny aquatic plants and animals that form the basis of all life in the water.
3. "Predator Prey" is about population growth and decline. It focuses on competitive predator-prey relationships in an ecosystem.
4. "What Moves Life" concerns the dependence of every organism on the physical factors in its environment.
5. "Life from Death" explores the recycling of energy whereby dead plants and animals become the building blocks for even the most advanced living organisms.

Available at 6.00 each from Urban Systems, Inc., 1033 Massachusetts Ave., Cambridge, Mass. 02138.

Deal, Borden. "Antaeus". **Ten Top Modern American Short Stories**. Bantam.

This brief story describes the plight of a farm boy moved to a large city. His problem, posed by the absence of accessible earth for planting, is overcome but not without tragedy.

Maxwell, Gavin. **The Otter's Tale**. Dutton.

Maxwell repeats his famous **Ring of Bright Water** story for children by leaving out much of the description of Scotland's coast, but introducing the charms of a new otter, Teko.

Milne, Lorus J. **The World of Night**. Harper.

Although an unlighted world is alien to man, still much of the world's life goes about its business after the sun sets. This fascinating book explores this dark world and the inter-relationships among its inhabitants.

## ORGANIZATIONS

Organizations are often used gratefully by teachers simply as dispensers of materials and information. The present situation in environmental education demands more from teachers now. They must commit themselves — their energies and time — to the organizations which are fighting to preserve our tenuous hold on this planet. Though increased teacher involvement in the work of conservation organizations will come more and better environmental educational programs.

Below are a very few organizations selected from a vast field. If the names of all the active conservation organizations from 'Save the Sea Otter' to the "Committee for Green Foothills" were to be included, this slight booklet would grow beyond reasonable proportions. However, included also are resource booklets in which you can obtain information about governmental organizations and those in your area.

North, Sterling. **Rascal: a Memoir of a Better Era.** Dutton.

A young boy raises a raccoon and experiences the wonder of sharing life with one of the wild world's most entertaining creatures.

Russell, Franklin. **Watchers at the Pond.** Knopf.

The unexpectedly dramatic story of a year's cycle within the teeming universe of a pond.

Ogburn, Charlton. **The Winter Beach.** Morrow.

Poetically and simply, Ogburn relates the experiences of walking the beaches and exploring the marshes of New England, unbothered by the summer crowds.

Smith, Agnes. **An Edge of the Forest.** Viking.

The leopard lies down with the lamb in a quiet, gentle, almost philosophic story of nature in which man is the only intruder.

Carson, Rachel. **A Sense of Wonder.** Harper Torch.

Rachel Carson's words and the unusually beautiful photographs of earth and sea and sky will help to keep alive a child's sense of wonder and that of the adult who shares the book with him.

**"Keep America Beautiful"** (Grades K-6). A public service booklet of anti-litter poems and songs by Henry Gibson, singer and actor. Prepared by Mr. Gibson & Lennan & Newell, Inc., a volunteer Advertising Council agency. Contact the Advertising Council in your area.

**Audubon Aids in Natural Science** (Grades K-12). A free pamphlet listing a variety of booklets, programs, charts, bulletins, etc. which are available, at low cost, from the Audubon Society. Write Educational Services, National Audubon Society, 1130 Fifth Avenue, New York, N.Y. 10028.

**People and Their Environment**, edited by Matthew J. Brennan (also Director of The Pinchot Institute for Conservation Studies). A new series of teaching guides to Conservation Education for elementary, junior and senior high schools. Each guide includes between 43 and 80 individual lessons, lists of instructional materials (films, pamphlets, charts, filmstrips, records) and where to find them. A complete bibliography for teachers is also included.

The individual guides are:

- Grades 1-2-3
- Grades 4-5-6
- Grades 7-8-9
- Grades 10-11-12 (Social Studies)
- Grades 9-10-11-12 (Home Economics)
- All Grades (Outdoor Classroom & Camping)

The guides are \$3.95 each. For three or more volumes, \$3.50 each, from J. G. Ferguson Publishing Company, 6 North Michigan Avenue, Chicago, Illinois 60602

**Conservation News.** This 15-20 page, twice monthly newsletter, is printed to fit in a looseleaf binder. As teacher resources, the articles are both political and ecological, very well-written and up-to-date. Occasionally, transparency-master cartoons are included. It is printed as an educational service of the National Wildlife Federation, 1412 Sixteenth St., N.W., Washington, D.C. 20036. Single copy subscriptions are free.

**Our Polluted World.** A 45-page, well illustrated, social studies unit book for grades 7-12. This booklet helps students understand the social and scientific factors involved in air and water pollution, then shows how this knowledge can be applied to solving urgent pollution problems. It discusses air pollution control, oil pollution of the seas, and pollution by radioactivity. 35c each, available from American Education Publications, Education Center, Columbus, Ohio 43216.

**Conservation Yearbooks from The Department of the Interior:**

- A. **It's Your World.** The story of people who have struggled to improve our environment and how they did it. \$2.00
- B. **Quest for Quality.** A description of the kind of natural world we seek to establish. \$1.00
- C. **The Population Challenge.** An examination of the environmental stress created by population pressures. \$1.25
- D. **The Third Wave.** An analysis of the new ecological approaches to conservation. \$2.00
- E. **Man — An Endangered Species?** A sounded alarm over the increasing destruction of the human habitat. \$1.50

Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

**Conservation Chart.** (Grades 4-7) A class learning activity which has students work with a large chart of two river valleys, Muddy River Valley and Clear River Valley. By reading the booklet accompanying the chart they learn about the two valleys and cut out fish, birds and animals to place in the appropriate part of the valley. Two or three students could work on each chart. Available for \$1.00 each, lower prices in quantity, from the Sport Fishing Institute, 719 - 13th St., N.W., Washington, D.C. 20005.

**Our Man-Made Environment**, published by the Group for Environmental Education and can be used in grades 7-9. A most unusual and exciting text-workbook dealing with "that part of the world which we have made for ourselves — the places in which we live and learn and play. These places include our houses, schools, parks, streets, neighborhoods and cities." This book asks four basic questions: 1. "What is the Man-Made Environment?, 2. Why do we build the Man-Made Environment?, 3. What forces affect the shape of the Man-Made Environment?, 4. How can we change the Man-Made Environment?" Several different kinds of problems are proposed for students to work through, some by discussion and some by constructing various forms and buildings included on the tear-out pages which alternate with the text. Single copies, \$4.75 plus tax and shipping, from Joseph Fox, 1724 Sansom St., Philadelphia, Pa. 19103. Prices for multiple copies from GEE! Group for Environmental Education, 1214 Arch Street, Philadelphia, Pa. 19107. Telephone: (215) LO 4-4403.

**A Place to Live**, published by the National Audubon Society, grades 4-6. A 64-page workbook which covers basic ecological concepts, as found in any urban environment. It is designed to be self-motivating and is written simply enough (3rd grade level) to be read independently by most fourth or fifth graders. Woven into the text are "Try This!" activities (writing, drawing, or group activities or experiments) which sustain the children's interest and amplify the concepts introduced. The booklet also includes nine "Walks" related to the text and not requiring transportation. Many ideas for supplementary experiences are included in the Teacher's Manual. Student texts are 75c each and the Teacher's Manual is \$1.50, from Educational Services, National Audubon Society, 1130 Fifth Avenue, New York, N.Y. 10028.

**1970 E.Q. (Environmental Quality) Index. "America is in Trouble"**, published by the National Wildlife Federation. This brilliantly colored and illustrated pamphlet is a report card for the American environment in 1970. The very clear charts, graphs and illustrations show students where we stand now in regard to our air, water, wildlife, timber, soil, minerals and living space. Very succinct suggestions for improving all areas included. Single copy free, 10-29 copies, 15c, 30-99 copies, 12c, 100-499 copies, 11c, from National Wildlife Federation, 1412 - 16th St., N.W., Washington, D.C. 20036.

**"You and Nature"**. (Grades 6-8). A large, colorfully illustrated 4 page pamphlet which compares good and bad conservation practices by asking students "Which America Do You Choose?" Excellent motivation for discussions or projects. Available free from The Department of Education, Office of Conservation, Sacramento, California 95814.

**Conservation-Fire Prevention Packet**. (Grades K-3). In California, 20-30% of all forest fires are caused by children. Alarmingly enough, studies indicate that the majority of these fires are caused by children under 10 years of age. The California Division of Forestry's objective in these units is to reduce the incidence of children-caused fires through an education process within the early elementary school programs. The program's specific purpose is to satisfy the child's curiosities about fire; to help the child understand and appreciate the cause and effect relationship of his actions; and to help the child understand fire's harmful effects to himself, others and his environment.

These units are completely visual and are well-suited to an inquiry approach. The packets contain teacher information, guidelines, student activities, and many visual aids on subjects of conservation and fire prevention. Available at \$6.00 each, plus tax, from the State of California, Department of Conservation, Division of Forestry, 1416 Ninth Street, Sacramento, California 95814.

**What's Ecology?** (Grades 9-12). A 51 page booklet by Robert Evans of Campolindo High School, Moraga, California. This is a well-illustrated, clear survey introduction to the field, quite appropriate for science classes. Included is an up-to-date bibliography of books and magazines. Individual copies are \$2.00; in bulk for classroom use, 50c. Order from Ecology Action Educational Institute, Box 3895, Modesto, California 95352.

**Ecology: Man Explores Life**. (Grades 7-9), by Jacqueline L. Harris, Erwin A. Steinkamp and the staff of **Current Science**. A study of ecology through case studies of scientists at work. As readers absorb ecological concepts, they also acquire an understanding of scientific problem-solving techniques in relation to their environment. Available at 35c each from American Education Publications, Education Center, Columbus, Ohio 43216.

**Big Rock Candy Mountain**, Winter 1970, a most unusual teaching catalogue published by The Portola Institute, Inc., 1115 Merrill St., Menlo Park, California 94025. Single copies, \$4.00; 6 issues per year, \$8 00. "The **Big Rock Candy Mountain** seeks to aid in the acquisition of this knowledge: not by molding the learner into a pre-established pattern, but by providing resources to help him quench his thirst; not by teaching meaningless stockpiling leading to a dissatisfied life, but by encouraging growth in the present leading toward a joyous old age; not by changing people, but by awakening a desire to change. This is our motivation for doing this catalogue."

Page 32: The Wilderness School and The Outward Bound program.

Page 33: Environmental Education films and filmstrips.

Page 34: Farallones Designs/Institute

Page 35: Our Man-Made Environment

plus 92 other pages of unusual education materials for all ages.

**Ecology: Man on Earth** (Grades 9-12, English classes). This kit focuses on four literary works: Steinbeck's **The Grapes of Wrath**, Thoreau's **The Best of Walden**, Adamson's **Born Free** and Faulkner's "The Bear". A teacher's guide has commentaries on the books, plus presentation plans, discussion questions and activities. Accompanying the guide are three large posters dealing provocatively with ecological themes and a photo pack, "Man and Environment", 12 8"x10" photo reproductions showing the disastrous effects of environmental decay on human lives. Some of the photos show the eroded land and the people of the Dust Bowl era to accompany **The Grapes of Wrath**. Other photos of urban decay relate directly to the problem of people leaving the ravaged farmlands in search of a better life. Kit available for \$3.50 from Scholastic Book Services, 904 Sylvan Avenue, Englewood Cliffs, New Jersey 07632.

**An AEP Ecology Program.** (Grades 4-8), coming in the summer of 1971. This series of five books will help students develop an understanding and appreciation of the intricate balance that exists between all forms of life and their supporting habitat. The major concepts and related understandings will be taught through an activity-centered approach involving reading and personal experience. Also, each book will have approximately four case studies for the student to read. A teacher's guide will accompany each book. More information on the series can be obtained from American Education Publications, Education Center, Columbus, Ohio 43216.

**Life Science Investigations: Man and the Environment.** (Grades 6, 7) by Frederick A. Rasmussen, Paul Holobinko, and Victor M. Showalter. This excellent, comprehensive life science book includes an entire unit on how man affects the environment. There are six major investigations in this unit:

1. Who pollutes your environment?
2. Is Lake Erie dead?
3. What is the price of progress?
4. What can we do about pests?
5. Why is clean air important?
6. The pollution game

A unique set of evaluation materials has been designed for this course. Following each investigation are one or more Mastery Items in which the student applies both knowledge and skills gained from working on related problems. The most significant feature of this text is that all its investigations focus on real problems where biology, technology, and society meet. Information on this text is available from Houghton Mifflin, 777 California Avenue, Palo Alto, California 94304.

**National Environmental Education Development.** The goal of the NEED program is to foster an appreciative and critical environmental awareness in our youth, through an understanding of the interactions of natural and social processes illustrated in National Park areas. Its further aim is to increase the will and capacity to improve the environment. Phase I of the NEED program emphasizes the appreciative level in an encounter with natural phenomena at an environmental school site, with emphasis on academic, aesthetic, and skill interpretations. This phase focuses on elementary-school levels. Phase II for the intermediate level of the program centers on man's positive and negative utilization of his natural resources, and his efforts to rectify a self-imposed contaminated environment through technological applications. Phase III (high school) will develop the necessity for environmental ethics, centered on attitudes of the individual. It will integrate the disciplines of political science, economics, and sociology. For further information on this new program write: Director, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240.

The **Ecology Controversy** by Gary E. McCu. n and David L. Bender. Volume Three of **Opposing Viewpoints Series**. This exciting 100 page booklet was prepared by two teachers to foster critical thinking, the ability to empathize, the skill to see both cause and effect and the difference between fact and opinion. There are readings, case studies and inquiry exercises. The areas covered are:

Chapter 1 — The Population Controversy

Chapter 2 — The Nuclear Radiation Controversy

Chapter 3 — The Air Pollution Controversy

Chapter 4 — The Religious, Political and Economic  
Consequences of the Ecology Controversy

Available at \$1.65 per single copy from the Greenhaven Press, Box 831, Anoka, Minnesota 55303.

**Grade Teacher**, January, 1969. This particular issue included many articles relevant to ecological conservation at the elementary grade level. Some are:

"Four Ecological Concepts You Must Get Across", pp. 110-114.

"How It Can Be Taught", pp. 100-109.

"Programs You Should Know About", pp. 122-125.

"Ecology: Why You Must Teach It", pp. 93-99.

"From Here to Ecology", p. 20+.

This field, our most up-to-date resource, is shared by the stalwarts who have been publishing for years and the new, crisis-oriented fledglings who are struggling for survival. Below is a selection of both types: (Those with an asterisk are for students).

### **I. Weekly Periodicals**

1. **National News Report**  
(12.00/yr.)  
Sierra Club  
1050 Mills Tower  
San Francisco, Calif. 94104
2. **CF Letter**  
(\$6.00/yr.)  
The Conservation Foundation  
1250 Connecticut Ave., N.W.  
Washington, D.C. 20036
3. **Environmental Action Bulletin**  
(\$10.00/yr.)  
Rodale Press, Inc.  
Emmaus, Pa. 18049
4. **Conservation Report**  
National Wildlife Federation  
Washington, D.C. 20036  
1412 · 16th St., N.W.
- \* 5. **My Weekly Reader and Senior Weekly Reader**  
(60c per pupil, per school year for 10 or more copies;  
\$1.20 per for less than 10)  
American Education Publications  
Education Center  
Columbus, Ohio 43216

## II. Periodicals by Membership

1. **Sierra Club Bulletin**  
(Annual dues are \$12.00-  
first year \$17.00, of which  
\$3.00 is for the **Bulletin**.)  
Sierra Club  
1050 Mills Tower  
San Francisco, Calif. 94104
2. **Natural History**  
(\$7.00/yr.)  
The American Museum of  
Natural History  
Central Park West, at 79th St.  
New York, N.Y. 10024
3. **Ranger Rick's Nature  
Magazine**  
(\$6.00/yr.)  
The National Wildlife  
Federation  
1412 Sixteenth St., N.W.  
Washington, D.C. 20036
4. **Cry California**  
(\$9.00/yr)  
California Tomorrow  
Monadnock Building  
681 Market Street  
San Francisco, Calif. 94105
5. **National Wildlife**  
The National Wildlife  
Federation  
1412 Sixteenth St., N.W.  
Washington, D.C. 20036
6. **Audubon**  
(\$10.00/yr. — Individual)  
(\$12.50/yr. — Family)  
National Audubon Society  
1130 Fifth Avenue  
New York, N.Y. 10026

## III. Periodicals by Subscription

1. **Not Man Apart**  
(\$5.00/yr.)  
Friends of the Earth/  
**Not Man Apart**  
8016 G Zuni Road  
Albuquerque, N.M. 87108
2. **Environment**  
(\$8.50/yr.)  
**Environment**  
438 North Skinker Blvd.  
St. Louis, Mo. 63130
- \*3. **The Curious Naturalist**  
(\$2.00/yr.)  
**The Curious Naturalist**  
Massachusetts Audubon  
Society  
Lincoln, Mass. 01773
- \*4. **Science News**  
\$7.50/yr.)  
**Science News**  
231 West Center St.  
Marion, Ohio 43302

# records records

A most entertaining and pervasive medium for reaching people of all ages is the phonograph record, broadcast around the clock and collected widely by young people. And when the song lyrics on records deal tellingly with our environmental crisis, there is a huge audience to be reached. Increasingly today, singers and folk/rock groups are singing of our environmental dilemma and our students are listening. Records on these topics should be heard and discussed often in the classroom both for the values they are espousing and for the metaphorical implications in their lyrics.

Below are listed two classic albums, but compiling a larger list is not the work of teachers, but of their students who are in daily touch with the music and can fill the classrooms with their own chosen examples.

1. "Pollution" on **That Was The Year That Was** by Tom Lehrer. Reprise #6179.
2. Many songs on the album **God Bless the Grass** by Pete Seeger. Columbia #9232.

# games games games

The growing field of simulation games offers several in the field of ecology or environmental control. Because many of these incorporate role-playing techniques in decision-making situations, they directly involve the student, provide him with up-to-date information and make him responsible, in the game's context, for his actions. When the games' premises and information have been checked for accuracy, what better all-around learning tool do we have available to us?

**MAN IN HIS ENVIRONMENT** (Grades 4-6) was developed as a public service by Coca-Cola. An Ecology Kit contains a teacher's guide which includes a short glossary of current terms and guidelines plus materials for the two exercises below:

**Rescue in Space** is designed to help children understand the principle that because the resources of the planet Earth are limited, we must learn to use our resources wisely and to reuse them where possible.

**Make Your Own World** is designed to help children understand that all elements of the environment are interrelated and interdependent. When man changes the environment, it has consequences not only for himself, but for other forms of plant and animal life, and for the soil, air and water.

The kit, games included, is available free to educators by calling or writing the local Coca-Cola Bottling Company.

**SMOG** and **DIRTY WATER**. Two games from Urban Systems in which each participant is a pollution control officer for his city and must deal with ever changing factors in regard to the environment. Available at \$10.00 each from Urban Systems, Inc., 1033 Massachusetts Ave., Cambridge, Mass. 02138.

**Ecology Begins at Home, A Household Environmental Handbook**  
Ecology Action  
San Fernando Valley State College  
9520 Etiwanda Avenue  
Northridge, California 91324

**Ecology Center**  
2179 Allston Way  
Berkeley, California 94704

**Conservation and Environmental Organizations**  
Sierra Club  
1050 Mills Tower  
220 Bush Street  
San Francisco, Calif. 94104

**General Guidelines for Environmental Involvement**  
Angeles Chapter, Sierra Club  
427 W. Fifth St.  
Los Angeles, Calif. 90013

**Conservation Education Resource Directory**  
Conservation Education Office  
Department of Education  
721 Capitol Mall  
Sacramento, Calif. 95814

# Commitment

collect your papers for recycling?

use returnable bottles only?

use or buy plastics and wax-coated containers  
as little as possible, knowing that presently they are not  
recycled?

if you use aluminium, always feel obligated to  
recycle it?

buy and use bio-degradable soaps rather than  
detergents?

use electrical power as a luxury, not as a  
necessity?

support a conservation organization with  
either your time or your money?

ever litter?

"If I cannot do great things,  
I can do small things in a great way."

# Notes