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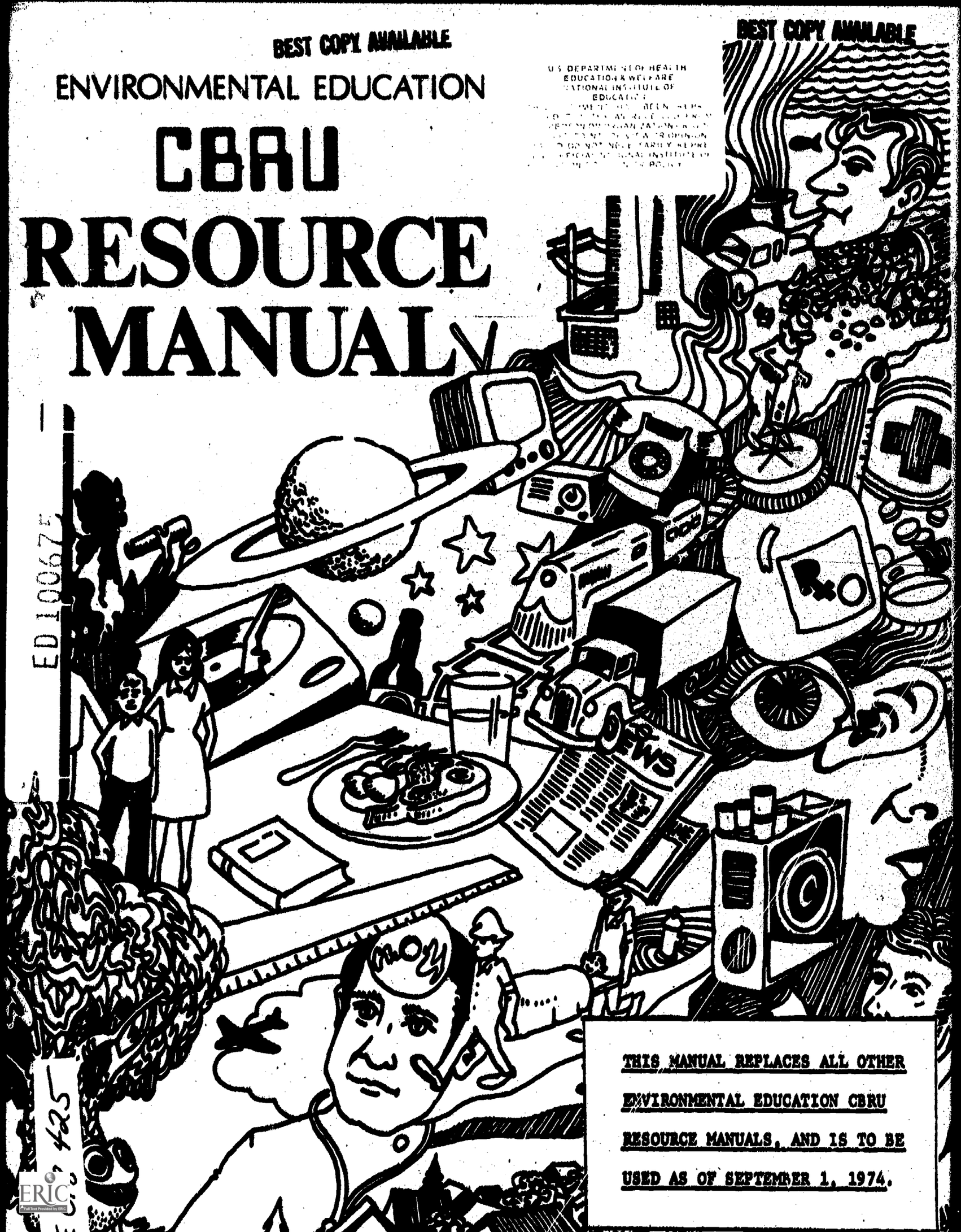
ABSTRACT

This environmental education resource manual deals with the computer based resource unit (CBRU) program available to New Jersey school teachers. The program is designed to unburden the teacher in planning classroom and out-of-school learning experiences based upon specific learner objectives for many grade levels and learning variables. Each resource unit provides objectives, content, activities, measuring devices and a comprehensive list of supplementary curriculum materials. This manual provides instructions for teachers who wish to obtain resource units from the computer center; units are in the form of a computer print-out. Steps for planning and completing the necessary forms are discussed. The possible units, including Population, Natural Resources, Pollution, Wetlands, and Primary Ecology, are briefly summarized. Specific objectives, mental age range, grade level, and instructional variables are included with each summary. The teacher may choose up to five objectives, which will be met in the unit she wishes to obtain. The objectives, mental age, and grade level, once identified are placed on the request form. The instructional variables, allowing the teacher to choose individual study areas for selected students, are also coded on the form. Forms are sent to the computer center. (Author/TK)

ENVIRONMENTAL EDUCATION

CBRU RESOURCE MANUAL



THIS MANUAL REPLACES ALL OTHER ENVIRONMENTAL EDUCATION CBRU RESOURCE MANUALS, AND IS TO BE USED AS OF SEPTEMBER 1, 1974.

ENVIRONMENTAL EDUCATION

CBRU

RESOURCE MANUAL

Prepared By

THE NEW JERSEY STATE COUNCIL FOR ENVIRONMENTAL EDUCATION
at Montclair State College
Upper Montclair, New Jersey
07043

Dr. Edward J. Ambry, Director

In Cooperation With

THE DIVISION OF CURRICULUM AND INSTRUCTION
NEW JERSEY STATE DEPARTMENT OF EDUCATION

Pursuant to

IMPLEMENTATION OF STATE OF NEW JERSEY

MASTER PLAN FOR ENVIRONMENTAL EDUCATION

GRANT NUMBER OEG-0-71-1754(290)

ELEMENTARY AND SECONDARY EDUCATION ACT

of 1965

TITLE III, SECTION 306

As Amended by Public Law 91-230

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The project reported herein was performed pursuant to a grant from the U. S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U. S. Office of Education and no official endorsement by the U. S. Office of Education should be inferred

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IMPORTANT NOTICES

After September 1, 1974

This Environmental Education CBRU Resource Manual was compiled to assist teachers in ordering Computer Based Resource Guides in Environmental Education, after September 1, 1974. It contains Objective and Variable lists for fifteen units.

Manual Use

This Manual replaces all previously published Environmental Education Resource Manuals. It is expanded to include information which will refresh the teachers' knowledge gained at a CBRU Training Session and provides new sections on instructions for filling out CBRU Request Forms, and the use of CBRU's in the instructional program. Although not designed to replace the CBRU Training Session provided by local school districts, it may serve as a self-training device, since the information provided is more comprehensive than that which was provided in previous manuals.

Additional Copies of Manual

Each school building in New Jersey has been supplied with one copy of this Resource Manual. If additional copies are needed, please arrange to duplicate these within your own school district.

Funds and Cut-off Date

The New Jersey State Council for Environmental Education and the State Department of Education have arranged for the special use of environmental education funds during 1974-1975 to enable New Jersey teachers to order CBRU's in environmental education without cost, on a first-come, first-served basis. Depending upon teacher demand, the funds will allow for distribution of CBRU's through May 15, 1975. If funds are depleted before May 15, 1975, a new cut-off date will be announced.

STATE OF NEW JERSEY
DEPARTMENT OF EDUCATION
[illegible] WEST STATE STREET
TRENTON, N. J.

Forward

by

Dr. Fred G. Burke, Commissioner

NEED FOR ENVIRONMENTAL EDUCATION

Concern for the environment of man has become a dominant social issue of our time. In New Jersey, the environmental dilemmas are many. The state is the most highly urbanized, most highly industrialized and the most densely populated state in the Nation.

Educators are being called upon to provide a program in environmental education at all levels. New Jersey teachers have responded to the call and have been ingenious in creating curriculum materials for use in local school districts. These efforts have contributed to raising the priority of the environment as a critical area in education on the state level. The recent mandate for thorough and efficient educational programs has now increased this emphasis even more.

The Resource Guide provided through the CBRU program is designed to unburden the teacher in planning classroom and out-of-school learning experiences based upon specific learner objectives for many grade levels and learning variables. It will enable the teacher to quickly organize instructional units for the entire class, small groups and individuals. It is designed to save teachers' time by providing objectives, content, activities, measuring devices and a comprehensive list of supplementary curriculum materials.

New Jersey teachers have a unique opportunity to meet the demand for environmental education. The units included in the CBRU program represent the labors of many and the commitment of local, state and federal funds. The New Jersey State Council for Environmental Education and the State Department of Education were pleased when more than 6,000 teachers used the CBRU program in 1973-74 and look forward to assisting teachers in their pursuit of educational excellence as they prepare their students to live in an improved environment in the future.

ACKNOWLEDGEMENTS

The series of Computer Based Resource Units entitled, "Environment and the Quality of Life," were developed by the New Jersey State Council for Environmental Education at Montclair State College, Upper Montclair, New Jersey, Dr. Edward J. Ambry, Director; The Conservation and Environmental Studies Center at Browns Mills, New Jersey, Dr. V. Eugene Vivian, Director

* * * * * *

Principal Developers of the series:

Population	Dr. Nicholas Michelli
Natural Resources	Stephen Schoen
Industrial-Economic Impact	Dr. Richard Lowell
Pollution	William G. Harding
Tocks Island	Gayle H. Brent, Karen Praeg
Pine Barrens	Thomas P. Smith, Robert Elder, Karen Praeg
Land Use	Thomas P. Smith
Wetlands	David Ainsworth, Karen Praeg
Energy-Technology	Dr. Richard Lowell
Energy-Society	Stephen Schoen
Energy-Transportation	William G. Harding
Primary Ecology	Gayle H. Brent
Environmental Law	Robert Elder

* * * * * *

Council staff members who assisted in the development of these units: Donald S. Calderon, Daniel J. Fennell, J. Ronald Gardella, Deborah Healy, Steven Johnson and Charlotte Tomaszewski.

Art work by Deborah Healy.

Two units, "Environment and Public Health," and "Its In To Be Out," were developed by the State University of New York College at Buffalo.

The Council extends its appreciation to Mr. Louis Iozzi, Environmental Consultant, Division of Curriculum and Instruction, New Jersey State Department of Education, for his assistance in the development of units, Dr. Daniel W. Kunz of Montclair State College for his contribution to the Pollution unit, Dr. Bertram C. Lindemann of Upsala for his help in general development, the Commissioner of Education's Technical Advisory Committee, and the Education Committee of the State Chamber of Commerce for their valuable advice.

* * * * * *

All units were formulated with the aid of teachers, administrators, students and citizens, representing sixteen communities around the state. Examples, illustrations and activities reflect the concerns of New Jersey and are used to demonstrate broader national and international issues. Our appreciation to the following Curriculum Development Team members:

Marion Blaetz
Richard Blommart
Nancy Bowne
Edward Bowne
Kurt Brenner
Steven Button
Dr. Kenneth Carlson
Richard C. Cole
Marilyn Cook
Marguerite Costa
Linda Deighan
Raymond De Palma
Nancy Depoto
Russell Donscher
Lynn Espenshade
Patricia Flavelle
John Freeman
Marian Fry
Linda Gardella
Margaret Gravvanis
Charles Graziano
Thomas Haines
Chester Hayes
Thomas Hill
David Hoke
Mary Jo Hulsart
Jay Kilpatrick
Barbara Kunz
Gloria Lehman
Maria Lyons
John A. Mengle
Barbara Michalski
Robert Moore
Peggy Murphy
Arne Olsen
Jo Anne O'Neill
Robert Ourmiller
Rev. William Outtrim
George Parrott
Trudy Patterson
Lida Phillips
Katherine Price
Sandra Pridgeon
Ann Ricci
Themis Santulli
Jay Shapiro
Thomas Siegfried
Frank Sidoti
Carol Simpkins
Steven Slovenz
Marie I. Urso
David Van Ness
Hilda Weissberg
Barbara Williams
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* * * * * *

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Edna E. Doll
Assistant Director in Charge of Curriculum
New Jersey State Council for Environmental Education

COMPUTER BASED RESOURCE GUIDE REQUEST FORM

Teacher's Name MOORE (LAST NAME) E (FIRST INIT.)

School Name Kennedy Junior High School

School Address 225 Main Street (Street) Newtown (City) N.J. (State) 09000 Zip

School District Newtown County Atlantic School Code No. 175240060

Grade Level 07

Subject or Class Type Social Studies

Class Enrollment 028

Number of Students for Whom This Guide is Ordered 020

This information is available from your school principal

PLEASE CHECK ONE:

Environmental Education	(1)	✓
L.D.T.C.	(2)	
Exceptional Child	(3)	
Other	(4)	

- - - For Special Education use only - - - - -

L.D.T.C.'s Name:

NO. CBRU's ORDERED PREVIOUSLY:

Environmental Education 01

Other 00

Part A

FOR OFFICE USE ONLY:

State Code No.

UNIT TITLE: Industrial and Economic Impact UNIT NO. 135

GROUP OBJECTIVES: (Select 1 to 5) 001 003 005 020

CLASS MENTAL AGE RANGE: Circle at least 3 and no more than 5 consecutive variables which indicate the approximate M.A. range of your class. (See unit for M.A. range limits of unit)

(Mental Age)	(0.5)	(1.0)	(1.5)	(2.0)	(2.5)	(3.0)	(3.5)	(4.0)	(5.0)	(6.0)	(7.0)	(8.0)	(9.0)	(10.0)
VARIABLE NO.	194	195	196	197	198	199	200	201	202	203	204	205	206	207

(11.0)	(12.0)	(13.0)	(14.0)	(15.0)	(16.0)	(17.0)	(18.0)	(19.0)	(20.0)	(Above 20)
208	209	210	211	212	213	214	215	216	217	218

Not applicable for this unit.

Part B

Leave one space between first & last name

Fill in "0" if number does not require all spaces

VARIABLES CATEGORIES (USE CODE NUMBERS)

	STUDENT NAME	IND. OBJ. (List 1 or 2)	STUDENT INTERESTS (List 4 - 6)	DEV TASKS (List 1 or 2)	RDG. LEVEL (List 1)	MENTAL AGE (MA) (List 1)	CHRON. AGE (CA) (List 1)	PHYS. HAND. (List 1 or 2)	LEARN. ENVIRON. (List 1)
1	SMITH DAVID	001 / 014	15 20 45 / 37		114	209			
2	HOWARD JANE	007 / 014	07 19 44 / 20 23		118	214			
3	THOMAS JILL	003 / 020	05 09 34 / 40		114	210			
4	WINKLER JOHN	005 / 013	16 19 21 / 28		117	213			
5	ZUCCA ROCCO	006 / 014	14 16 18 / 21 27		117	212			

9/1/78

PREPARING TO USE THE COMPUTER BASED RESOURCE GUIDE

PLANNING

The developers of these Computer Based Resource Units believe that planning for selection and use of Computer Based Resource Guides (CBRG's) is a teacher-pupil function, beginning several weeks before the Guide is requested. You are urged to involve students in selecting the unit, choosing group and individual objectives, and identifying individual or group interests, to the extent you judge this to be appropriate and feasible.

REQUESTING THE COMPUTER BASED RESOURCE GUIDE

Send Request To: New Jersey State Department of Education
Teacher Resource Unit Project
P. O. Box 630
New Brunswick, New Jersey 08903

ADMINISTRATIVE DATA (See the upper left and right portions of the sample request form on page 6)

Address - The section at the top of the request form requires the name and complete address of your school. This is the address to which the CBRG will be returned. Please be sure to include the Zip Code number.

School Code Number - This is an IBM Code Number assigned to each school district by the State Department of Education. You should be able to get this number from the business office of your school or district. If you are unable to ascertain this number, leave the space blank. This will not cause undue delay in processing your request.

Grade Level - Should be a number from K-12.

Subject or Class Type - Use such descriptions as Educable, Non-graded, Science, Social Studies, etc.

Class Enrollment - The total number of students in your class, or if you are a departmental teacher, the total number of students in all of your classes.

Number of Students for Whom This Guide Is Ordered - This number may differ from the class enrollment, if you use the unit with a group of your students.

NOTE: To the right of the address area, there is a small box. Please check which type of CBRU you are requesting. If ordering through an L.D.T.C., please include his/her name. If you have ever ordered and used a CBRG before, record the number ordered and distinguish whether used in Environmental Education or another area. If this is your first CBRG order, please leave blank.

PART A

In filling out Part A of the order form, you are requesting up to five objectives for your class or group within a specified Mental Age range. The Mental Age range has much to do with the kind of material supporting an objective, so please consider it carefully.

Unit Title and Unit Number - The Unit Number is given in this Manual, right below the title of the unit. It can also be found in the table of contents on page 1.

Group Objectives - Group Objectives do not have to be consecutive numbers. You are asked to enter the objectives which you and your class plan to achieve as a group. Review the objectives listed for the unit, select a maximum of five and enter the numbers.

Class Mental Age Range (Minimum 3, Maximum 5) - These must be listed consecutively. First select (or approximate) the average mental age of your class and then indicate on the M.A. range a maximum of 1 or 2 numbers above the average, and 1 or 2 numbers below the average. Be sure the M.A.'s you circle are within the M.A. Range Limits provided by the unit developers and listed at the top of the first page for each unit as it appears in this Manual. The variable numbers listed above each M.A. are computer code numbers which should be encompassed within your circles. If you circle M.A.'s for which the computer does not have information, the computer will reject your request.

PART B (Optional)

This section provides the opportunity to order objectives for as many as five students in your class whom you feel could or should work individually or for whom you are planning individualized instruction.

If your request includes this section, additional material, based on individual characteristics, will accompany the class guide which you receive. Guides for individual students, marked with their own name, will be composed primarily of activities. You may find that those activities would also be suitable for other individuals or small groups of students in the class with similar characteristics and learning needs.

In preparing this section, you should refer to the manual for the Student Interests, Reading Levels, Mental Age ranges and other variables offered for each particular unit. REMEMBER, THESE ARE COMPUTER CODE NUMBERS AND SHOULD BE LISTED AS CODE NUMBERS, EVEN IF THEY REPRESENT A REAL NUMBER, SUCH AS READING LEVEL OR M.A.

To Complete Part B

First Column - Write in a student's name. Some teachers prefer not to identify students by name. You may substitute a letter or abbreviation if you wish. In this case, be sure to keep a record which will enable you to identify the appropriate information for each student when you receive the computer printout.

Second Column - List the numbers for one or two objectives for each student. The one or two objectives may be the same as those you have requested in Part A or different. They may be similar or different for each student. The code numbers you list in the remaining columns instruct the computer to select and print out information stored within the computer which has been coded by the developers for a wide variety of individual differences.

Third Column - List four to six CODE NUMBERS for Student Interests. Check to see which Interest Codes are offered for the unit you have selected.

Fourth Column - Enter CODE NUMBERS for Developmental Tasks. (Check the Manual - some units have none coded to them. When this is the case, skip this column.)

Fifth Column - Enter one Reading Level CODE NUMBER for each student.

Sixth Column - Record one Mental Age CODE NUMBER for each student.

For the Environmental Education Units - Skip the seventh, eighth and ninth columns; Chronological Age, Physical Handicaps and Learning Environments.

DON'T FORGET, student variables must be written in CODE NUMBERS. Variables are not identical for each unit. Be sure to check those applicable to the unit you are selecting. The variables which you list are the Codes which tailor the guide to the individual needs of your class.

When you have completed the CBRU Request Form, it is a good idea to retain a copy for your records before mailing the original.

REVIEWING YOUR GUIDE

Your Computer Based Resource Guide should be delivered in one or two weeks after your request is received, hopefully sooner.

You should examine the printout to be certain your name is on it and that it is for the unit you requested. While there are two distinct parts within the printout, the Class Guide and Individual Guides, they will not be physically separate. You may wish to separate the individual sections, headed with the name of one of the students you listed, from the group Guide. The pages, held by a perforated border along the top, are easily detached. You may, in fact, wish to separate all of the pages of your Guide and bind them in another way. Some teachers have pasted activities on index cards for distribution. In any event, you will wish to review the components of the Guide: absorb the extent and type of content, its themes, characteristics, and potential as an organizing feature for certain lessons. Linger over the activities, selecting among them, visualizing the variety of settings for their realization. Relate the Components to objectives and evaluation items, review the materials. As you become familiar with the Guide, consider its relation to class learning and the opportunities suggested for individual and directed work, you will no doubt be mindful of the goals and expectations which led to your request. Relating the components of the Guide to the objectives chosen, and to the joint goals of the class in choosing the unit, will facilitate its introduction and use.

We would like to hear more from you after you have received your Guide - about its applicability, the flexibility you employed and the ways the Guide fit into your teaching requirements. An outline addressing these subjects is enclosed with each Guide. It would be useful to review this along with the Guide when it arrives. As your unit progresses in the classroom, your response to this outline of questions will be most helpful. When you mail it to us, the pattern of information will materially advance future service of CBRU's. Please help us to help you in the ways you want to be helped.

CBRU - A CYBERNETIC SAGA

The present system of Computer Based Resource Units in New Jersey is not a test tube baby. Its parentage is traceable to some of the most fertile episodes in educational thinking in the last decade and one-half. In its growth and development, it has been assisted and tutored by projects and people which, in the composite, represent a remarkable coalescence of Federal education dollars and manpower to promote common goals in a multi-state arena.

As many as 15 years ago, Dr. Robert Harnack, at Buffalo University, was instructing his graduate students in an exciting new concept he had developed for organizing and presenting curriculum themes according to objectives and for individualized use. This idea formed one of the earliest approaches to Computer Assisted Planning of Instruction.

A long list of Dr. Harnack's students continued serious work on the CBRU concept. Elsewhere in New York State, methods of development and use of CBRU's were applied under state Title III grants. The Research and Development Complex at the State University of New York College at Buffalo, with grants from several education sources, began extensive development of CBRU's. Using gifted classroom teachers, recruited into multidisciplinary teams, the Buffalo group developed more than forty units - two of these, It's In To Be Out and Environment and Public Health, appear in this Manual.

New Jersey became associated with the CBRU system in 1971, when a Title VI-G project in Parsippany-Troy Hills contracted to deliver Buffalo units to teachers of handicapped students throughout the state. In the same year, the State Council for Environmental Education began research on the design of computer based curriculum systems and undertook development of the series on "Environment and the Quality of Life." Finally, these units were entered into Buffalo's CBRU system and are being distributed in New Jersey through the collaboration of the State Council (a Federal Title III, 306 Project) and the State Department of Education, Division of Curriculum and Instruction.

Extensive training in the CBRU system has been conducted in New Jersey and eight other Northeastern states. In New Jersey, programs were held in every county; training kits, manuals, film strips and cassettes were provided for every school district. In eight other states, from Pennsylvania to Maine, the Council conducted training for State Departments of Education through a Title V grant. Conceived by Dr. Harnack, impelled by State Title III, refined and sharpened by Buffalo, organized and developed in New Jersey under support from Titles III and VI-G, and beginning throughout the Northeast under Title V, the CBRU program is a major example, perhaps a unique example, of the coalescence of education dollars from different programs to achieve common educational purposes and greater cumulative impact.

POPULATION

Unit Code Number 133

Grades 8-12
(M.A. Range Limits - 12.0-17.0 & Above)

Two thousand years ago people on the earth numbered about 200 million. Today, world population is nearly 4 billion. By the year 2000, we will number roughly 6 billion. One thinks of the cartoon of the ragged man standing on the globe with an SRO sign. Population change is one of the most critical environmental issues we face. Through the unit, students can explore the sources of this change: What has happened historically to attitudes in countries with declining birth rates? What is the role of minorities? What choices do we as individuals have? What role, if any, should government play? Some of these issues may be politically sensitive, but most of these objectives can be used profitably in any classroom.

OBJECTIVES

1. To explain the significance of the population growth rate for society.
2. To describe the interrelationships among factors involved in population change.
5. To describe the factors affecting changes in world population trends.
6. To explain the relationship between industrial development and the growth of urban areas.
7. To describe the factors which cause migration and immigration.
10. To compare the characteristics of American families as reflected in the media with those found in one's own community.
11. To identify the attitudes toward family size as reflected by contemporary legislation.
13. To assess the validity of the proposition that population growth is necessary for power and economic expansion.
14. To explain the relationship between industrialization and population growth.
15. To determine the role of minority groups in population growth.
17. To describe population changes in the United States between 1900 and the present.
18. To evaluate the implications of the current lower birth rate in the United States for population change.
19. To identify the location of current and projected urban areas.
20. To analyze the relationship of family size to parental income and education.
21. To describe the impact of immigration and migration on American population.
22. To discuss the implications of crowding and density for people.
25. To describe the implications of population growth on natural resources.

POPULATION

Unit Code Number 133

Objectives (Cont.)

30. To describe the impact of population change on urban areas.
31. To discuss the implications of early marriage for the individual and society.
32. To compare and contrast national policies on population control in the United States, Japan and India.
33. To identify birth rates needed for a stabilized population.
34. To describe the implications of age distribution for society in the areas of recreational and educational facilities.
35. To predict the implication for society of a larger proportion of older residents resulting from a stabilized population.
37. To predict possible changes in attitude in a nation approaching stabilization.
40. To evaluate various proposals which utilize fiscal and social penalties and incentives in an effort to limit population growth.
45. To discuss the implications of changing roles for women on population growth.
46. To analyze the issues related to legalized abortion.
47. To describe various aspects of population control through limiting births.
49. To analyze the ramifications of current trends in population growth patterns in the United States.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1.	Agriculture	13.	Folklore/Customs	21.	Religion
2.	Anthropology	14.	History	22.	Economics
5.	Biology	15.	Home Economics	23.	Education
7.	Business	16.	Mathematics	26.	Sociology/ Family Living
9.	Communication	17.	Philosophy/Ethics		
10.	Earth Science/Geography	19.	Political Science/Law	30.	Medicine/Health
12.	Foreign Cultures/Languages	20.	Psychology		

Reading Level (Relative to grade level, not age level - select one)

114.	7	118.	11
115.	8	119.	12
116.	9	120.	Above 12
117.	10		

Mental Age (Select one)

209.	12.0	212.	15.0
210.	13.0	213.	16.0
211.	14.0	214.	17 and above

NATURAL RESOURCES

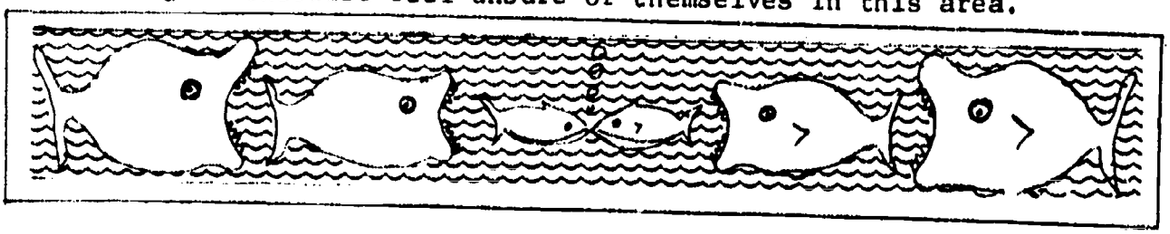
Here Today, Gone Tomorrow?

Unit Code Number 134

Grades K-8
(M.A. Range Limits 5.0-14.0)

The harsh realities of suddenly having to do with little gas and being faced with other dreary aspects of the energy shortage forces us to focus on one of the most important environmental problems of our lives. Now, it is clear to us that demand outstrips known supplies of many of the resources we have always taken for granted. Some of the technological gains which we so proudly hailed bred problems we never dreamed of, and "clean" energy seems years in the future. Only through the combined efforts of all of us working within social, political and legal structures can the situation be remedied.

At first glance, this unit might seem too sophisticated for young children, but on closer examination, it becomes obvious that there are many objectives within the comprehension of children in the primary school. The content will be found helpful to teachers who might otherwise feel unsure of themselves in this area.



OBJECTIVES

Grades K-8

1. To describe the interacting components of the biosphere.
2. To describe the interacting components of the ecosystem.
3. To describe the process of ecological succession.
4. To describe the process of energy flow, transfer and utilization within the biosphere.
5. To analyze the significance of food chains to all living organisms.
8. To differentiate between renewable and non-renewable resources.
9. To describe the relationship between living and non-living things.
10. To examine alternative ways of evaluating and determining natural resource availability.
11. To trace the changing patterns of land settlement in the United States from the colonial period to 1900.
12. To show how a land ethic may differ from one culture to another.
13. To identify current land use patterns in the United States.
14. To analyze the relationship between land availability and land use conflicts.
15. To identify some important factors affecting land dedicated to agriculture.

Here Today, Gone Tomorrow?

Unit Code Number 134

Objectives-Grades K-8 (Cont.)

16. To describe a natural forest ecosystem.
17. To analyze current and projected demands for domestic forest products.
18. To investigate ways to solve domestic shortages of forest resources.
20. To identify societal factors leading to unplanned development of land resources in the United States.
23. To analyze land use patterns and functions in urban areas.
27. To identify some important characteristics of mineral resources.
28. To list the factors which determine the cost of and demand for mineral resources.
29. To analyze the influence of mineral resources on economics and politics.
30. To assess the current and projected demand for mineral resources.
31. To identify the different sources of energy.
32. To identify several methods used to harness energy for power.
33. To identify the ways in which modern man uses energy.
36. To analyze the short-term and long-term social costs of using resources at the current world rate.
38. To assess the implications of natural resource supply given continuing increases in U. S. population.

Grades 4-8

6. To assess the need for persons pursuing careers associated with the protection, preservation and conservation of the environment and its resources.
7. To list private and public agencies concerned with protection and preservation of natural resources.
19. To relate the factors of rising population and increased leisure time to the demand for outdoor recreation land and facilities.
21. To contrast single and multi-purpose planning for land use.
24. To describe the process of regional planning.
25. To identify some problems encountered in regional planning.
26. To analyze regional planning activities in relation to specific human demands.
34. To identify several characteristics of nuclear energy.
35. To identify the consequences of expanding this nation's natural resource base.
37. To analyze the relationship between natural resource depletion and individual freedom.

NATURAL RESOURCES

Here Today, Gone Tomorrow?

Unit Code Number 134

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

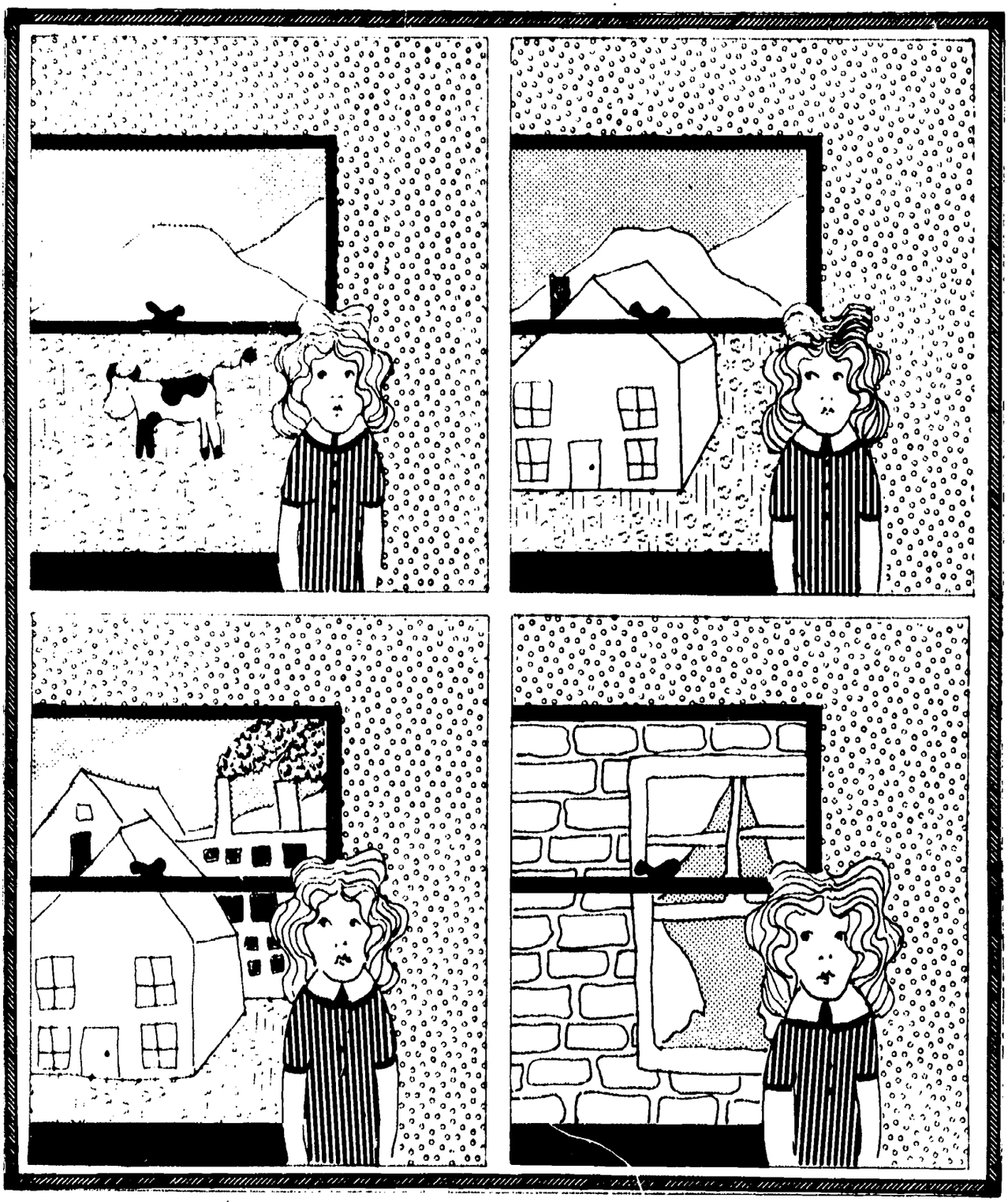
1. Agriculture-Food Production
2. Anthropology-People
3. Astronomy
4. Biography/Autobiography
5. Biology-Living Things
6. Botany/Zoology-Plants & Animals
7. Business
8. Chemistry
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts-Making Things
12. Foreign Cultures/Languages
13. Folklore/Customs
14. History
15. Home Economics
16. Mathematics
17. Philosophy/Ethics
18. Physics
19. Political Science/Law
20. Psychology
21. Religion
22. Economics-Making a Living
23. Education
24. Engineering/Technology
25. Fiction/Mythology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
29. Performing Arts-Role Playing
30. Medicine/Health
31. Adventure
32. Poetry
33. Creative Writing

Reading Level (Relative to grade level, not age level-select one)

108. 2.0
109. 2.5
110. 3.0
111. 4.0
112. 5.0
113. 6.0
114. 7.0
115. 8.0
116. 9.0
117. 10.0
118. 11.0
119. 12.0
120. Above 12

Mental Age (Select one)

202. 5.0
203. 6.0
204. 7.0
205. 8.0
206. 9.0
207. 10.0
208. 11.0
209. 12.0
210. 13.0
211. 14.0



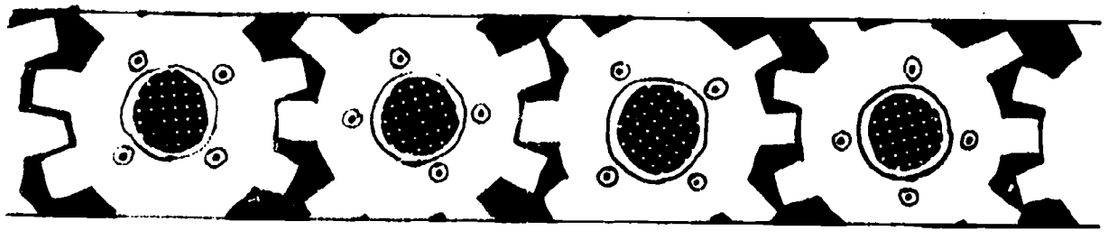
INDUSTRIAL AND ECONOMIC IMPACT

Is Bigger Always Better?

Unit Code Number 135

Grades 8-12
(M.A. Range Limits - 12.0-18.0)

Today we are coming to see that the tremendous growth of technology (used to produce the answers to our dreams) is straining many parts of our environment. There is sludge in the oceans, lakes are dying, smog stains the atmosphere, and dumps disfigure the land. This CBRU for older students investigates some historical and present day problems which relate industrialization and the environment, compares economic systems, and investigates the development of a market economy. There is also information on selected economic concepts such as utility and economic vs. social value, exponential and linear growth, economic mechanisms and environmental quality, and the problems of third world countries.



OBJECTIVES

1. To determine the societal needs provided by an economic system.
2. To identify the three types of economic systems which societies have evolved for meeting their needs.
3. To analyze traditional-based elements remaining in the present economic system.
4. To describe an economic system based on command and cite elements of command in our present economic system.
5. To describe an economic system based on the market and cite examples of how our system reflects the market.
6. To evaluate the solution of environmental problems through the mechanisms available in each of the major economic systems.
7. To contrast the agricultural base of pre-market Europe's economy with agriculture as practiced in modern industrial nations and underdeveloped countries.
8. To determine the relationship among wealth, power and economic activity in pre-market European society.
9. To evaluate the effect of religious thought on economic activity in pre-market European society.
10. To relate the economic renaissance in Europe to the evolution of poor land use practices.
11. To identify the factors of production in a market economic system.
12. To relate the monetization of pre-market European economy to the origins of capitalist economic attitudes.

Objectives (Cont.)

13. To evaluate the potential for producing environmental degradation of characteristic mechanisms in a market economic system.
14. To discuss reasons why large scale manufacturing was not practiced prior to the Industrial Revolution.
15. To determine the conditions prevailing in England which contributed to the Industrial Revolution.
16. To analyze the relationship between technological advances of the industrial revolution and industrial-related problems.
18. To analyze the changes in energy availability and use which occurred in the agricultural revolution and the industrial revolution.
23. To describe the meaning of utility in economic terms.
24. To analyze the differences among utility, marginal utility and negative marginal utility.
25. To contrast the economic concepts of economic value and social value.
26. To evaluate the potential for applying the concepts of utility, marginal utility and social cost to environmental planning.
28. To describe how the mechanisms of supply and demand can effect environmental quality.
29. To relate economic costs to the solution of environmental problems.
30. To relate social costs to the solution of environmental problems.
31. To contrast and give examples of linear and exponential growth.
32. To relate exponential growth and positive feedback loops.
33. To relate exponential growth and positive feedback loops to industrial growth.
34. To discuss forsaken alternatives as a means of computing true economic costs.
35. To discuss the relative contributions of population and industrial-economic growth, to environmental problems.
36. To discuss elements of economic and industrial growth which cause minimal environmental degradation.
37. To analyze some implications of a no growth economy.
38. To discuss the position held by underdeveloped nations regarding industrial growth and environmental quality.
39. To determine American social values towards economic growth and its resultant environmental effects.
40. To analyze the environmental impact as a result of providing third world nations with modern agricultural system necessary for economic and industrial growth.

INDUSTRIAL AND ECONOMIC IMPACT

Is Bigger Always Better?

Unit Code Number 135

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

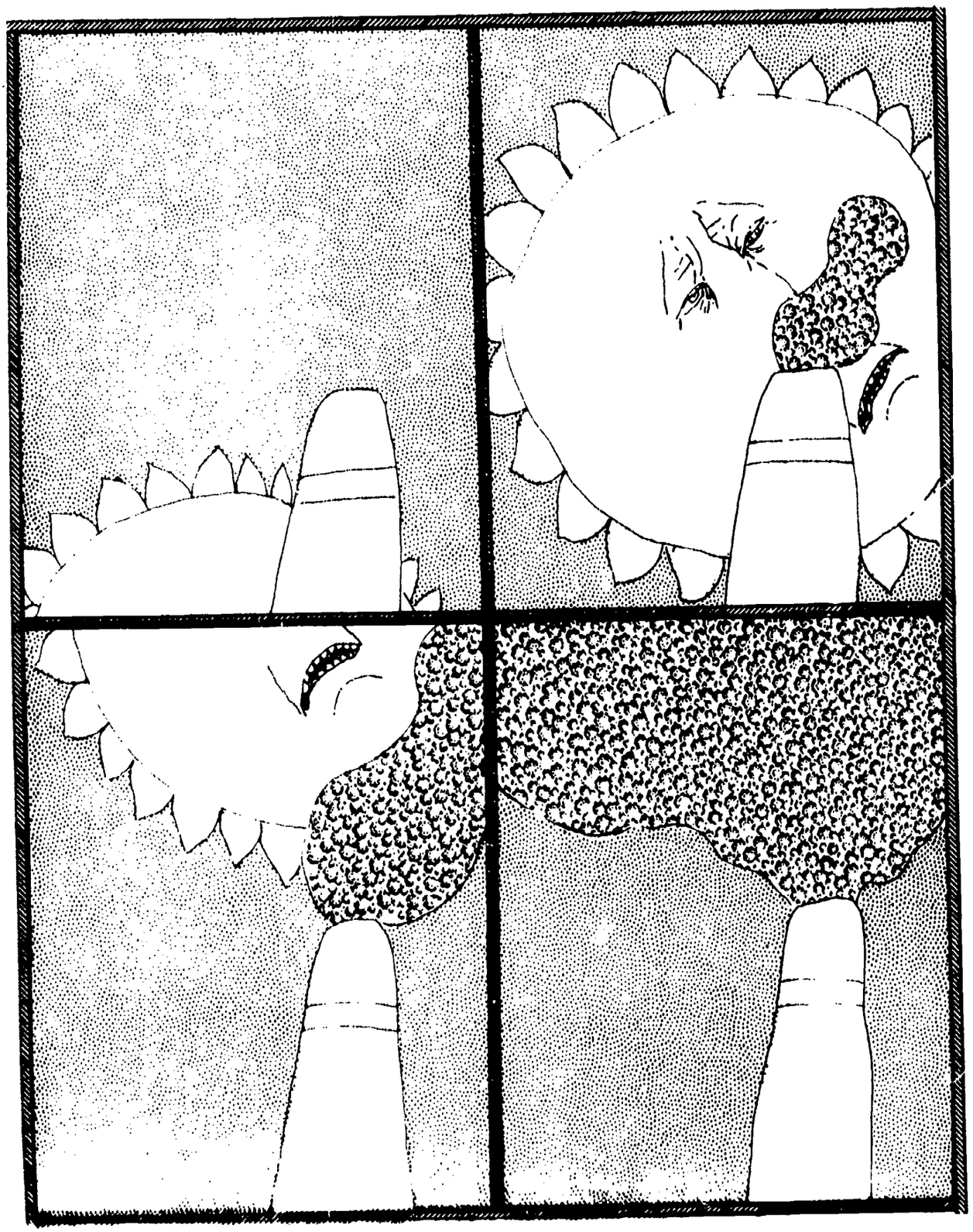
1. Agriculture
2. Anthropology
5. Biology
6. Botany/Zoology
7. Business
8. Chemistry
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts
12. Foreign Cultures/Languages
13. Folklore/Customs
14. History
15. Home Economics
16. Mathematics
17. Philosophy/Ethics
19. Political Science/Law
20. Psychology
21. Religion
22. Economics
23. Education
24. Engineering/Technology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
30. Medicine/Health

Reading Level (Relative to grade level, not age level - select one)

114. 7.0
115. 8.0
116. 9.0
117. 10.0
118. 11.0
119. 12.0
120. Above 12.0

Mental Age (Select one)

209. 12.0
210. 13.0
211. 14.0
212. 15.0
213. 16.0
214. 17.0
215. 18.0



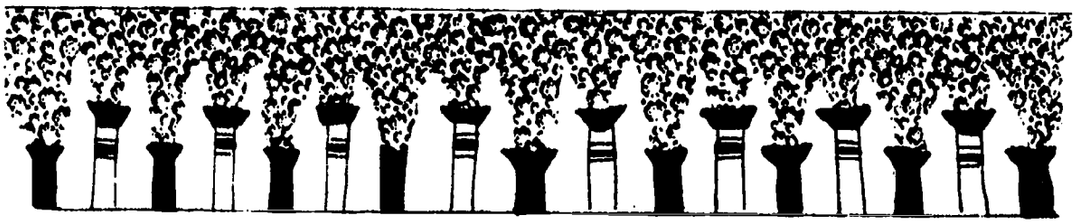
POLLUTION

The Aftermath of the Good Life

Unit Code Number 136

Grades K-12
(M.A. Range Limits - 5.0-18.0)

What you always wanted to know about pollution, but were afraid to ask! Can you identify pollutants in your own neighborhood? What is the link between energy and pollution? How does pollution affect health, the environment, economics? Are there technical or social solutions to pollution problems? How much would they cost? Could your class select and defend a strategy for effecting a solution consistent with their own set of values? What kinds of laws do we have? What kind do we need? This is a big unit on a popular subject. It will help you identify student interests, add to their knowledge and clarify some of their value judgments.



OBJECTIVES

Grades K-8

1. To analyze the interrelationships between living organisms and their environment.
2. To cite examples which demonstrate that the ability of an animal to adjust to its environment is critical to survival.
3. To describe the processes of recycling in nature.
4. To determine pollutant saturation levels for air and water.
5. To evaluate the hypothesis that air and water are limited resources.
6. To evaluate the implications of pollution to food webs.
7. To determine the various types of pollution.
8. To identify evidence of pollution in one's immediate environment.
9. To determine the differences in pollution produced by various energy sources.
10. To evaluate the economic and relative feasibility of polluting as compared to not polluting.
11. To ascertain that pollution is a relative concept.
12. To analyze the effects of pollution legislation.
13. To describe ways in which man first began to change his environment.
14. To determine an individual's effect on pollution.
15. To discriminate between flagrant and innocent actions resulting in pollution.
16. To evaluate the implications of short and long term benefits of pollution control for individuals and industries.
17. To analyze the interrelationships among decline of population in urban settings, pollution and quality of life present in these areas.

Objectives (Cont.)

Grades K-12

18. To describe the relationship between pollution and the common ownership of air and water resources.
23. To identify the characteristics of common air pollutants.
24. To assess the economic and environmental impact of each type of air pollutant.
26. To evaluate the effectiveness of existing air pollution legislation.
28. To determine the characteristics of common water pollutants.
29. To assess the economic and environmental impact of each type of water pollutant.
30. To evaluate various types of water purification systems relative to their economic and environmental impacts.
31. To evaluate the effectiveness of existing water pollution legislation.
38. To determine the characteristics of noise and visual pollution.

Grades 6-12

19. To describe the legal basis for common ownership of air and water resources.
20. To analyze the economic implications of common ownership of air and water resources.
21. To evaluate the contribution of the concept of common ownership to environmental pollution.
22. To defend one means from among alternatives for society to absorb the cost of air and water pollution.
25. To evaluate alternative methods of control for each type of air pollutant.
27. To defend a plan for developing an educational program which enables students to investigate air pollution problems.
32. To defend one means from among alternatives for achieving legally established water quality standards.
33. To determine the characteristics of common land pollutants.
34. To assess the economic and environmental impact of each type of land pollutant.
35. To evaluate alternative methods for each type of land pollutant.
36. To analyze selected environmental legislation to determine the regulatory powers of local, state and federal agencies.
37. To defend a strategy for county-wide land use planning.
39. To assess the physical and psychological effects of noise and visual pollution.
40. To assess the economic and environmental impact of noise and visual pollution.
41. To evaluate alternative methods of control available for noise and visual pollution.

Objectives-Grades 6-12 (Cont.)

42. To defend a plan for regulating noise or visual pollution in accord with the student's expressed values.
43. To determine the first and second laws of thermodynamics.
44. To contrast the characteristics and operation of economic and ecological systems.
45. To describe the phenomenon of a dynamic equilibrium in economic and ecological systems.
46. To analyze the trends of economic and ecological systems.
47. To evaluate the hypotheses that economic and ecological growth can continue indefinitely.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1. Agriculture-Food Production
2. Anthropology-People
5. Biology-Living Things
6. Botany/Zoology-Plants & Animals
7. Business
8. Chemistry
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts-Making Things
14. History
15. Home Economics
16. Mathematics
18. Physics
19. Political Science/Law
20. Psychology
22. Economics-Making a Living
23. Education
24. Engineering/Technology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
29. Performing Arts-Role Playing
30. Medicine/Health
33. Creative Writing

Mental Age (Select one)

202.	5.0	205.	8.0	208.	11.0	211.	14.0	214.	17.0
203.	6.0	206.	9.0	209.	12.0	212.	15.0	215.	18.0
204.	7.0	207.	10.0	210.	13.0	213.	16.0		

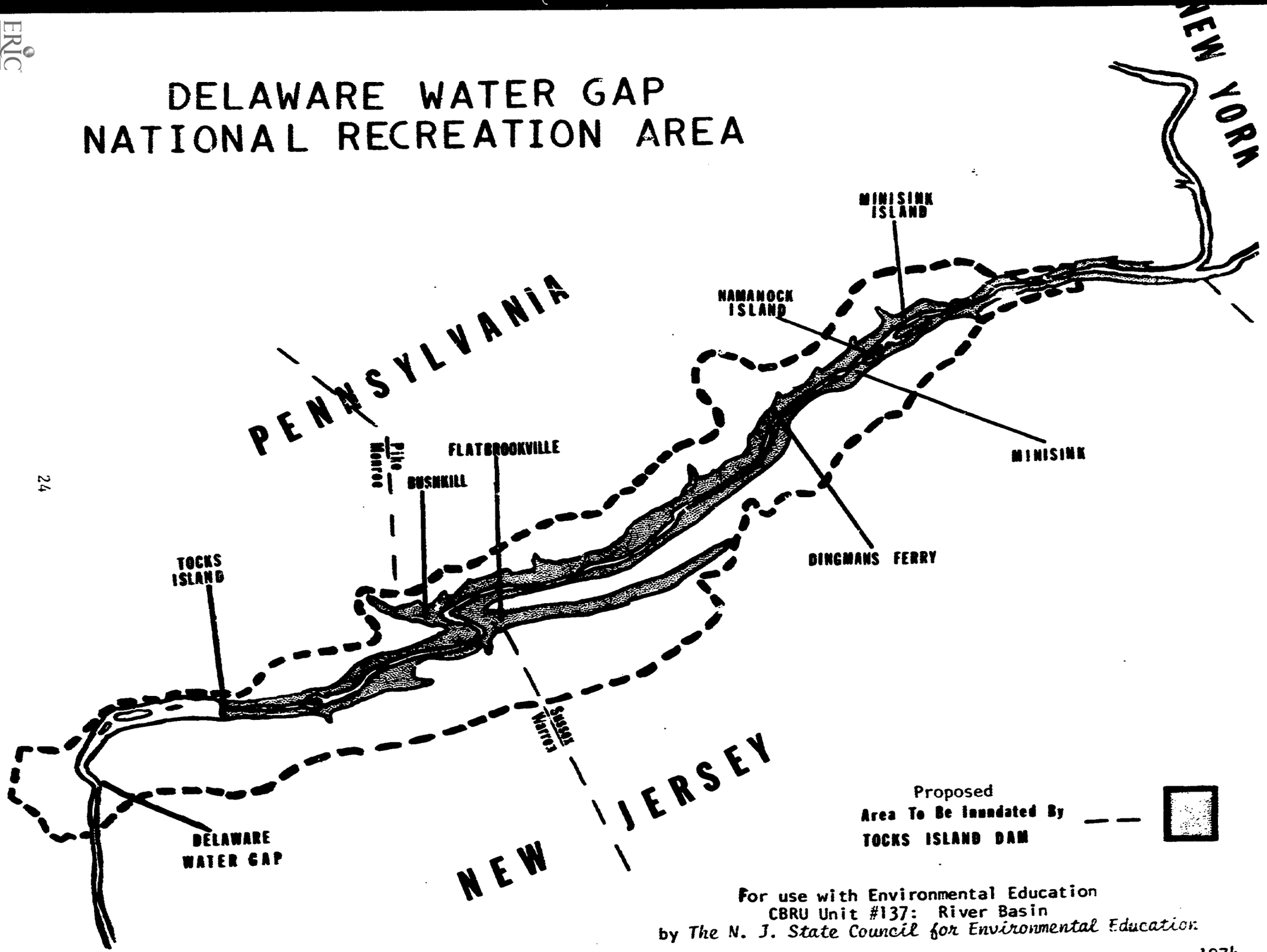
Reading Level (Relative to grade level, not age level - select one)

105.	Primer	108.	2	111.	4	114.	7	117.	10	120.	Above 12
106.	1	109.	2.5	112.	5	115.	8	118.	11		
107.	1.5	110.	3	113.	6	116.	9	119.	12		

Developmental Tasks (Grades K-6 only) (Select 1 or 2)

78. Developing fundamental skills in reading, writing or calculating.
79. Developing concepts necessary for everyday living.
80. Developing conscience, morality and a sense of values.
88. Developing intellectual skills and concepts necessary for civic competence.
91. Acquiring a sense of values and ethical system as a guide to behavior.

DELAWARE WATER GAP NATIONAL RECREATION AREA



For use with Environmental Education
CBRU Unit #137: River Basin
by *The N. J. State Council for Environmental Education*

1974

A RIVER BASIN - TOCKS ISLAND

A Case Study

Unit Code Number 137

Grades 4-12
(M.A. Range Limits - 9.0-18.0)

Should a wild river be tamed to provide the needs of an exploding population in terms of energy, recreation and flood control? Will a dammed river create problems we cannot forsee? Are other forms of energy more feasible? Is this the only way we have of preventing floods? Is mass recreation better than solitary or small group pleasure? These are only a few of the problems which the states of New Jersey, New York and Pennsylvania must grapple with in studying the possibility of damming the Delaware River. The particular concerns in this unit are far reaching and, like all other environmental problems, affect the future. Students will learn to research unique geological formations, describe choices, formulate plans, evaluate answers and defend their arguments. Reading the objectives will give you a good overview of what this unit attempts to do.

OBJECTIVES

Select objectives pertinent to your grade level. Teachers should plan to use objectives marked by an asterisk (numbers 3, 6, 10 and 21) with Part A only. They contain valuable content and interesting measuring devices, but not enough activities to satisfy the requirements for Part B of the request form.

Grades 4-8

1. To describe some natural features of a river valley in a geologically unique area.
2. To recognize geological factors which have shaped the most prominent features of a river valley.
*3. To relate the natural and man-made features of the Delaware River Valley to the possibility of flooding.
4. To recognize the diversity and interaction of living organisms found in river and valley ecosystems.
5. To define the characteristics of a river system which makes it distinct as a body of water (distribution of communities, bottom soil, currents, changes in dimensions).

Objectives (Cont.)

Grades 4-12

*6. To identify the watershed boundaries of the Delaware River.
7. To describe the historical and aesthetic features of the Tocks Island area.
8. To determine why early settlements were along rivers.
9. To determine the uses which man makes of river water in the Delaware River Valley.
*10. To develop a rationale for maintaining wild rivers or damming them.
11. To describe the choices associated with changing the region into a National Recreational Area.

Grades 8-12

12. To decide whether a selected body of water meets criteria for selected uses.
13. To identify historical and current reasons people choose to change the flow or structure of a river.
14. To describe and compare several types of dams and their effects.
15. To identify the characteristics of recreational resources.
16. To formulate plans for recreation in the Tocks Island region.
17. To design a plan to protect unique features of the land (topographical, historical and aesthetic features).
18. To recognize some of the natural limitations that influence the development of a land area.
19. To describe the consequences of past land misuse.
20. To describe the need for interstate cooperation to resolve problems (pollution, land use, etc.) associated with the Delaware River Basin.
*21. To explain the impact of an increased population on a land area.
22. To analyze the various methods of treating waste water and their impact on the environment.
23. To recognize the factors involved in the eutrophication of a body of water.
24. To evaluate the effects of building a dam at an aesthetically valuable river site in a culture with rising energy demands.
25. To defend an argument supporting or rejecting a pumped storage hydroelectric plant such as planned at Tocks Island.

A RIVER BASIN - TOCKS ISLAND

A Case Study

Unit Code Number 137

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1.	Agriculture-Food Production	18.	Physics
5.	Biology-Living Things	19.	Political Science/Law
6.	Botany/Zoology-Plants & Animals	22.	Economics-Making a Living
7.	Business	24.	Engineering/Technology
8.	Chemistry	26.	Sociology/Family Living
9.	Communication	27.	Sports/Recreation
10.	Earth Science/Geography	28.	Transportation
11.	Fine Arts/Crafts-Making Things	30.	Medicine/Health
14.	History	33.	Creative Writing
16.	Mathematics		

Reading Level (Relative to grade level, not age level - select one)

111.	4.0	114.	7.0	117.	10.0	120. Above 12
112.	5.0	115.	8.0	118.	11.0	
113.	6.0	116.	9.0	119.	12.0	

Mental Age (Select one)

206.	9.0	209.	12.0	212.	15.0	215.	18.0
207.	10.0	210.	13.0	213.	16.0		
208.	11.0	211.	14.0	214.	17.0		

PINELANDS

A Case Study

Unit Code Number 141

Grades 6-12
(M.A. Range Limits - 9.0-18.0)

There is a kind of enchantment in the Pine Barrens. The air is light, the streams run brown and clear, the sun sets over a whole forest of bonsai-like dwarf pines, and the "Pineys", the people who live in the area, can tell you of deserted villages, old mines and odd plants that grow nowhere else in the world. You can pick blueberries and see cranberries being harvested after the frosts come. The Pine Barrens will change. Already, highways split the woods, tracts are being developed, and shopping malls are planned. Students are given the opportunity to investigate this unique area, explore its problems, clarify values and design some development schemes which will be environmentally sound.

OBJECTIVES

1. Identify the topographical and geological characteristics located within the boundaries of the Pine Barrens.
2. Investigate unique natural and historical features of the Pine Barrens.
3. Indicate reasons why historic and natural sites should be preserved.
4. Suggest ways of protecting the unique natural and historical features of the Pine Barrens.
5. Determine the physical characteristics of a given soil.
6. Determine the cultural requirements of various plants.
7. Determine the types of plants that can grow in the Pine Barrens.
8. Evaluate the possibility of large scale agricultural production in the Pine Barrens.
9. Describe several biogeochemical cycles in nature.
10. Identify ways in which technology has bypassed natural cycles.
11. Explain several consequences of ignoring ecological cycles.
12. Evaluate some corrective measures which might be taken to alleviate environmental stress resulting from technology.
13. Identify the resources of the Pine Barrens which were used by pioneering industries.
14. Explain the role played by Pine Barrens industries in the socioeconomic life of early America.
15. Analyze the factors which led to the decline of Pine Barren industries.
16. Explain the impact of an increasing population on a land area.
17. Determine some of the natural limitations that influence the development of a land area.

Objectives (Cont.)

18. Describe the relationship of the following factors to Land Use: aquifer, watershed, flood plain, water table, recharge area.
19. Describe the consequences of past land misuse.
20. Describe the fire climax nature of the Pine Barrens vegetation.
21. Establish guidelines for use of the land to produce satisfactory environmental quality.
22. Explain the criteria used in assessing outdoor recreational resources.
23. Appraise the recreational resources of the Pine Barrens.
24. Evaluate various development schemes for the Pine Barrens.
25. Select a development plan for the area which would protect natural and historical features.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1. Agriculture-Food Production
5. Biology-Living Things
6. Botany/Zoology-Plants & Animals
7. Business
8. Chemistry
9. Communications
10. Earth Science/Geography
11. Fine Arts/Crafts-Making Things
14. History
16. Mathematics
19. Political Science/Law
22. Economics-Making a Living
24. Engineering/Technology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
29. Performing Arts-Role Playing
30. Medicine/Health
33. Creative Writing

Reading Level (Relative to grade level, not age level - select one)

111.	4.0	116.	9.0
112.	5.0	117.	10.0
113.	6.0	118.	11.0
114.	7.0	119.	12.0
115.	8.0	120.	Above 12

Mental Age (Select one)

206.	9.0	211.	14.0
207.	10.0	212.	15.0
208.	11.0	213.	16.0
209.	12.0	214.	17.0
210.	13.0	215.	18.0

LAND USE

Unit Code Number 142

Grades 4-12
(M.A. Range Limits 9.0-20.0)

One of our most pressing environmental problems is land use. Land is a finite factor. With more of us and our ever-increasing needs and desires, there is a squeeze on the earth itself. How can we best use what we have? What land uses promote environmental quality? Shall we have plots of land 50x100 or cluster housing? How much land is required for commerce, industry, the raising of food, recreation? What are the problems of zoning?

Objectives 1-17 for grades 4-7 describe general land use patterns and discuss such problems as how land is formed, features which limit its growth, and how man changes the land.

Objectives 18-34 for grades 8-12 deal more with social, political and economic aspects of land use. The overall goal of the unit is to further awareness of the principle of land stewardship.

OBJECTIVES

Grades 4-7

1. To compare the way people are dependent on land.
2. To analyze people's dependence on the most advantageous management of land.
3. To explain the ways successful food growing relies on good land use.
4. To describe several ways to improve the appearance of land in your environment.
5. To analyze the importance of land as a support base for plants and animals.
6. To evaluate the effects of changes people make upon the land.
7. To identify the need for open spaces in populated areas.
8. To suggest alternatives to covering the land with undesirable development.
9. To describe natural changes in land.
10. To describe the composition of soil.
11. To describe the evolutionary process of soil formation.
12. To identify natural factors which limit the use of land.
13. To suggest compatible land uses for selected areas.
14. To analyze land usage in a city.
15. To analyze who controls land use in selected areas.

Objectives-Grades 4-7 (Cont.)

16. To explain the need for varying criteria for land use in different areas.
17. To identify the procedures used in mapping land.

Grades 8-12

18. To evaluate different trends in housing developments.
19. To explain the differences between various types of land use maps.
20. To trace the historical evolution of land use practices.
21. To analyze the implications of land use practices in various civilizations.
22. To explain the intent of ecological land use planning.
23. To analyze criteria used in developing land use plans.
24. To explain procedures used in developing land use plans.
25. To identify people and agencies at all levels of government with land use planning responsibilities.
26. To identify major problems in urban land use.
27. To analyze the need for open space.
28. To explain the concepts of incompatible and non-forming land uses.
29. To analyze the consequences of unregulated land use.
30. To compare alternative methods of acquiring open space.
31. To analyze the effects of an expanding technology on land use.
32. To analyze the economic factors and tax structures which influence land use.
33. To compare the concepts of property rights and land stewardship.
34. To analyze the ecological impact of limiting diversity in selected environments.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

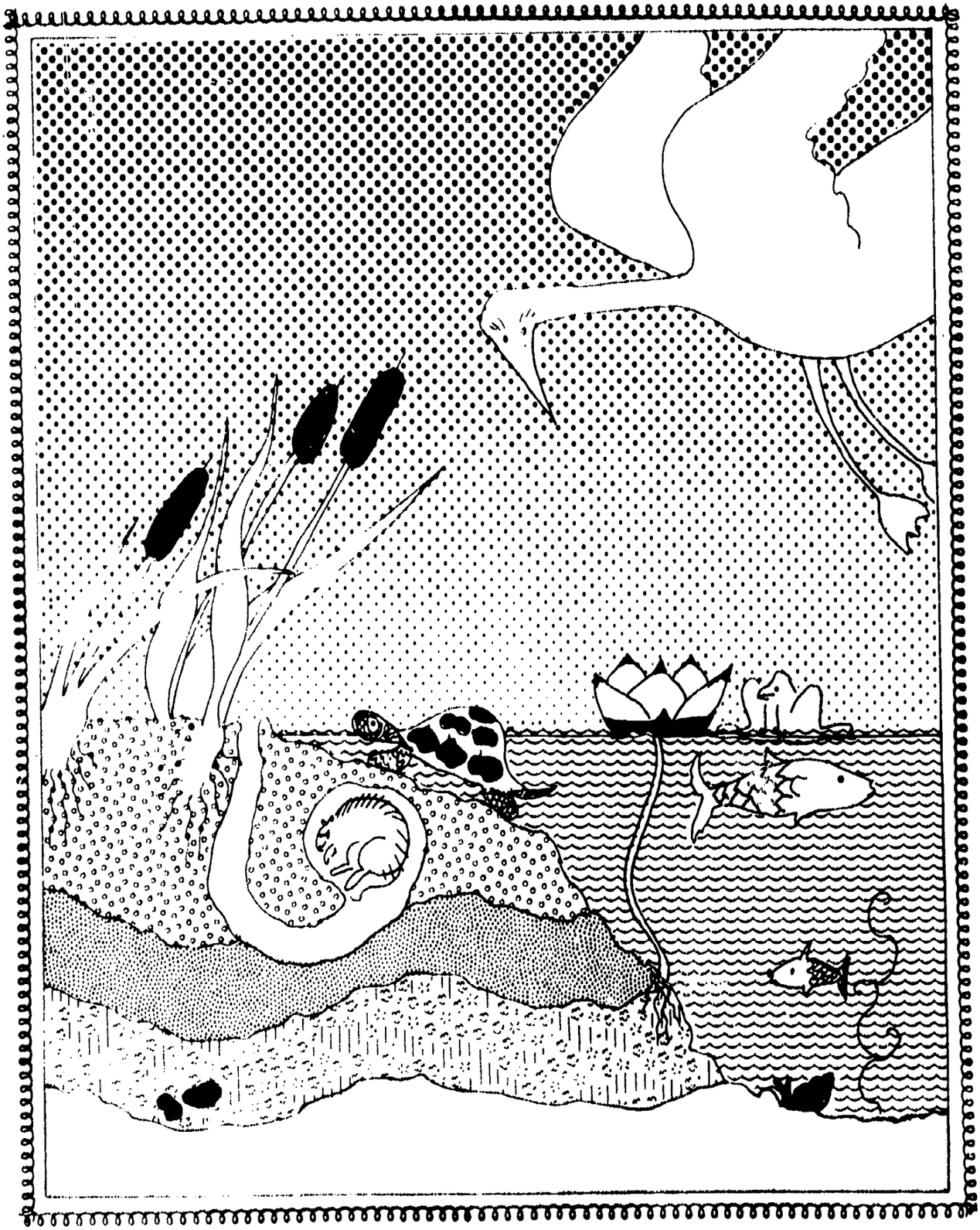
1. Agriculture-Food Production
2. Anthropology-People
5. Biology-Living Things
6. Botany/Zoology-Plants and Animals
7. Business
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts-Making Things
14. History
16. Mathematics
17. Philosophy/Ethics
19. Political Science/Law
22. Economics-Making a Living
24. Engineering/Technology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
33. Creative Writing

Reading Level (Relative to grade level, not age level - select one)

111. 4	114. 7	117. 10
112. 5	115. 8	118. 11
113. 6	116. 9	119. 12

Mental Age (Select one)

206. 9.0	209. 12.0	212. 15.0	215. 18.0
207. 10.0	210. 13.0	213. 16.0	216. 19.0
208. 11.0	211. 14.0	214. 17.0	217. 20.0



WETLANDS

A Case Study

Unit Code Number 143

Grades 6-12
(M.A. Range Limits - 9.0-Above 20)

What do you think of when you read the word "wetland?" A soggy, boggy place full of mosquitoes? A dump? A place which exists to be filled in and built on? Traditionally, these are the answers which most people think of. Not true, of course. Wetlands are valuable resources and are now being protected by law. This unit gives students an opportunity to investigate the ecological importance of wetlands, assess their commercial, recreational and aesthetic potential, devise plans to protect, preserve and develop wetland areas, and to formulate and express opinions as the result of personal investigation. The Hackensack Meadowlands are frequently cited for specific examples, but the unit can be used in all areas where wetlands exist.

OBJECTIVES

1. To determine the location of the wetlands.
2. To define the major types of wetlands.
3. To describe the origin and nature of topographical features of the wetlands.
4. To delineate the extent of development of the wetlands.
5. To explain the role of saltwater wetlands as a buffering zone between land and sea.
6. To analyze physical factors which retard development in the wetlands.
7. To describe the diversity of living organisms in a wetlands environment.
8. To explain the interdependence and adaptation of wetland inhabitants.
9. To determine the physical conditions necessary for the existence of selected wetlands plants and animals.
10. To analyze the physical and chemical characteristics of water in selected wetlands.
11. To evaluate changes in plant and animal life resulting from altering wetlands.
13. To describe the historical development of a selected wetland.
14. To determine the needs and pressures resulting in development of the wetlands.
15. To analyze the effects on wetlands resources of past land use.
16. To evaluate the role of law and politics in regulating development schemes.

Objectives (Cont.)

17. To describe the impact of sewage on wetlands environment.
19. To compare the characteristics (physical conditions, flora, faunt, etc.) of a stabilized unpolluted wetland with characteristics of a polluted wetland.
20. To predict consequences on the environment resulting from the development of wetland areas.
21. To delineate short-term and long-term environmental problems produced by landfill operations.
23. To formulate criteria for development of wetlands.
25. To formulate a plan to preserve a selected wetlands area.
26. To suggest ways to use wetlands which lead to minimum ecological damage.
27. To determine ways that a polluted wetlands can be restored to a stabilized condition.
28. To develop a system that would maximize use of solid waste and minimize environmental impact.
29. To take a position supporting or opposing further development of selected wetlands.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1. Agriculture-Food Production
5. Biology-Living Things
6. Botany/Zoology-Plants & Animals
7. Business
8. Chemistry
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts-Making Things
14. History
15. Home Economics
16. Mathematics
19. Political Science/Law
23. Education
24. Engineering/Technology
25. Fiction/Mythology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
29. Performing Arts-Role Playing
32. Poetry
33. Creative Writing

Reading Level (Relative to grade level, not age level - select one)

112.	5	115.	8	118.	11
113.	6	116.	9	119.	12
114.	7	117.	10	120.	Above 12

Mental Age (Select one)

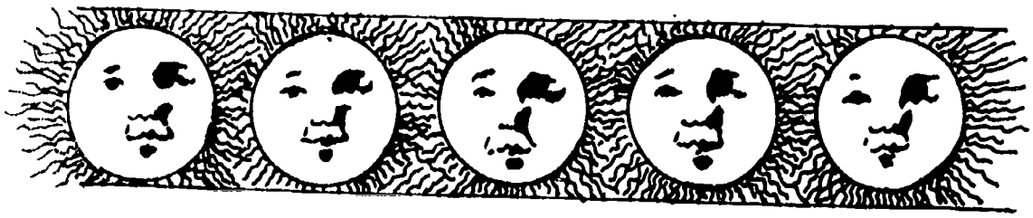
206.	9.0	209.	12.0	212.	15.0	215.	18.0
207.	10.0	210.	13.0	213.	16.0	216.	19.0
208.	11.0	211.	14.0	214.	17.0	217.	20.0
						218.	Above 20

ENERGY-TECHNOLOGY

Unit Code Number 144

Grades 8-12
(M.A. Range Limits - 12.0-20)

This unit is intended to explore many of the technical and social questions relating to major proposed energy options. The technological options explored range from fossil fuel applications to nuclear fission and fusion, solar energy, fuel cells and others. In addition, questions of energy transmission, waste and conservation are examined. This unit is generally technical in orientation and should be of particular value to science teachers.



OBJECTIVES

1. To discuss the role of fossil fuels in the production of energy.
2. To analyze the process of solid and liquid fuel gasification.
3. To investigate power gas and combined cycles as sources of clean power from fossil fuels.
4. To determine the increases in efficiency which could be derived from applying coal to the production of magnetohydrodynamic power.
5. To explain the general principles of power production in a fission nuclear reactor.
6. To identify some of the pro's and con's of nuclear power.
7. To explain the general operating principles of nuclear breeder reactors.
8. To analyze the potential of geothermal energy as a major future energy source.
9. To analyze the potential of solar energy as a major future energy source.
10. To describe the potential utility of several kinds of photovoltaic cells for the conversion of solar energy.
11. To relate the problem of solid waste disposal to the potential of solid waste as an energy fuel source.
12. To identify the general principles of the nuclear fusion reactor.
13. To evaluate the potential for fusion reactors using magnetic containment.
14. To evaluate the potential for thermonuclear power derived from laser fusion.
15. To discuss the limits of currently used methods of energy transmission.
16. To contrast selected proposals for new energy transmission methods with existing transmission technology.
17. To evaluate the potential of fuel cells as a means of dispersed energy generation.
18. To evaluate the potential of liquid and gaseous hydrogen as an alternative to fossil fuels as a prime energy source.
19. To discuss a variety of examples of energy waste in modern society.

Objectives (Cont.)

20. To evaluate proposals for energy conservation and efficient energy use in terms of energy wasting in our society.
21. To determine future energy demands.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

5. Biology
7. Business
8. Chemistry
10. Earth Science/Geography
11. Fine Arts/Crafts
16. Mathematics
18. Physics
19. Political Science/Law
22. Economics
24. Engineering/Technology
26. Sociology/Family Living
28. Transportation
33. Creative Writing

Mental Age (Select one)

209. 12.0
210. 13.0
211. 14.0
212. 15.0
213. 16.0
214. 17.0
215. 18.0
216. 19.0
217. 20.0

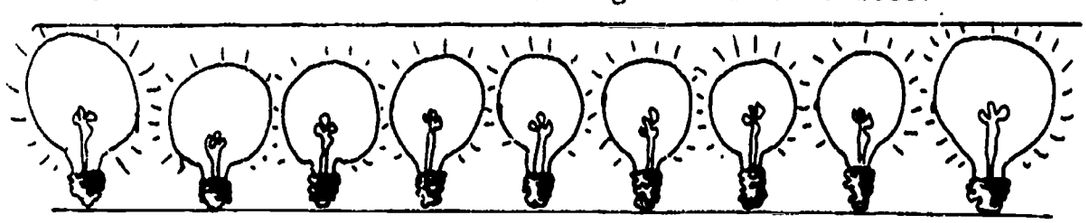
ENERGY-SOCIETY

The Electric Company and the Good Life

Unit Code Number 145

Grades 4-8
(M.A. Range Limits - 8.0-13.0)

We use more energy than anybody in the world. We have everything from power corn pickers to electric can openers. We use tremendous amounts of energy for agriculture, construction, transportation, leisure time activities and nonsensical pursuits. Suddenly, we are faced with shortages. Large questions hang over our heads. Does increasing energy consumption really improve the quality of life? How long will fossil fuels last? Are we willing to pay the price of environmental degradation? Can we depend on nuclear power? What role should the United States take in supporting underdeveloped nations in their urge to industrialize? The decisions that we make individually and collectively will affect not only our lives but those of future generations as well.



OBJECTIVES

1. To identify United States trends in energy consumption since 1860.
2. To examine the relationship between growth in energy consumption and GNP (Gross National Product).
3. To examine the relationship between energy consumption and population growth.
4. To evaluate current perceptions as to why there is an energy shortage.
5. To identify several important dimensions of the current energy shortage.
6. To examine the relationship between energy consumption, actual needs, and the stimulus for demand created through promotion and advertising.
7. To compare relative environmental impacts of selected alternative power sources from raw material extraction to consumption.
8. To distinguish between short-term and long-term solutions to energy problems.
9. To determine the significance of attaching social costs as well as economic ones to the price of energy for power.
10. To identify the possible desirable effects of a substantial increase in energy prices.
11. To identify some socially undesirable effects resulting from increased prices for energy.
12. To examine an alternative economic structure consistent with moderation and stabilization of energy consumption.
13. To identify the relationship between effective land use and regional planning to the use of energy.
14. To discuss the impact of energy scarcity on United States agriculture.
15. To analyze energy consumption in the industrial and commercial sectors from the point of view of improving efficiencies.

The Electric Company and the Good Life

Unit Code Number 145

Objectives (Cont.)

16. To examine new forms of architectural design for buildings, based upon efficient energy use and greater varieties of energy sources.
17. To analyze the relationship between energy consumption and the automobile.
18. To assess the growing need for a coordinated national energy policy.
19. To identify key elements of a national energy program.
20. To examine the feasibility and desirability of adopting an energy policy based upon United States self-sufficiency.
21. To demonstrate the value of public participation and referendum in the planning, development and conduct of power generating facilities.
22. To identify consumper products from petrochemicals.
23. To examine the regulatory mechanisms for monitoring and controlling nuclear power development.
24. To determine potential public health hazards associated with nuclear power development.
25. To outline a program of decision-making to assess and evaluate the full impact of a given technology prior to its broad implementation.
26. To evaluate the notion that abundant, clean and efficient energy will solve many of mankind's social ills.
27. To determine ways in which citizens can personally respond in times of energy shortages.
28. To determine recycling and reuse of materials as it relates to energy conservation.
29. To discuss the value of positive social and economic incentives in attaining sound energy conservation measures.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1. Agriculture-Food Production
2. Anthropology-People
5. Biology-Living Things
7. Business
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts
12. Foreign Cultures/Languages
13. Folklore/Customs
14. History
15. Home Economics
16. Mathematics
17. Philosophy/Ethics
18. Physics
19. Political Science/Law
20. Psychology
21. Religion
22. Economics-Making a Living
23. Education
24. Engineering/Technology
26. Sociology/Family Living
28. Transportation

Mental Age (Select one)

205. 8.0
206. 9.0
207. 10.0
208. 11.0
209. 12.0
210. 13.0

ENERGY-TRANSPORTATION

Or, What a Way to Go!

Unit Code Number 146

Grades 2-8
(M.A. Range Limits - 5.0-15.0)

It's a great American custom - to go! Transportation accounts for 25% of the energy used in the USA and is growing at twice the rate of the population growth. This unit encourages students to trace the historical development of transportation from pre-jitney to jet, and analyzes what the phenomenal growth has done to our environment. What kinds of transportation save energy? What are the problems of mass transportation? Is the big car on the way out? What personal sacrifices will we have to make? Decision-making situations are presented and students can choose among alternatives, deciding what is best personally, economically and environmentally.

OBJECTIVES

1. To identify objects in our homes used in transporting things.
2. To identify people who help us transport other people and things.
3. To identify alternative modes of transportation present in the United States.
4. To analyze the transportation needs of a local community.
5. To analyze the transportation patterns of a local community.
6. To identify transport system characteristics.
7. To trace the history of transportation in the United States.
8. To analyze the relationship between land use potential and transportation.
9. To analyze the influence of transportation on the American economy.
10. To relate modes of transportation to their energy sources.
11. To analyze the impact of transportation on the energy crisis.
12. To describe the economic structure and organization of segments of the transportation industry.
13. To identify the roles of selected governmental agencies in transportation planning.
14. To evaluate the impact of surface, air and sea transport facilities on the environment.
15. To analyze the relationship among the energy crisis, economic growth and the environment.
16. To analyze the relationship between the development of transportation and social mobility.
17. To evaluate a plan for financing the cost of transportation.

ENERGY-TRANSPORTATION

Or, What a Way to Go!

Unit Code Number 146

Objectives (Cont.)

18. To compare mass transit vs. personal transportation.
19. To investigate whether transit systems should be integrated with the economy of a region.
20. To predict future changes in transportation networks and facilities.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1.	Agriculture-Food Production	14.	History
2.	Anthropology-People	15.	Home Economics
4.	Biography/Autobiography	16.	Mathematics
5.	Biology-Living Things	19.	Political Science/Law
7.	Business	22.	Economics-Making a Living
8.	Chemistry	23.	Education
9.	Communication	24.	Engineering/Technology
10.	Earth Science/Geography	26.	Sociology/Family Living
11.	Fine Arts/Crafts-Making Things	33.	Creative Writing

Reading Level (Relative to grade level, not age level - select one)

111.	4	116.	9
112.	5	117.	10
113.	6	118.	11
114.	7	119.	12
115.	8	120.	Above 12

Mental Age (Select one)

202.	5.0	208.	11.0
203.	6.0	209.	12.0
204.	7.0	210.	13.0
205.	8.0	211.	14.0
206.	9.0	212.	15.0
207.	10.0		

PRIMARY ECOLOGY

From Amoeba to Alligator

Unit Code Number 147

Grades K-3
(M.A. Range Limits - 5.0-9.0)

Many teachers enjoyed an old unit called "From Trees to Toads." But the information in it became outdated, and this new unit takes its place. We hope you like it. It is designed to supplement the curriculum you already teach, and you can use it to enrich science, social studies or language arts. There are many new activities and materials.

The guide deals with four familiar concepts in the study of Ecology. Objectives 1-4 are concerned with the concept of Adaptation and Evolution. Change and Continuity are covered in Objectives 5-9. Diversity appears in Objectives 10-13, and Interdependence, the key ecological concept, is investigated in Objectives 14-17.

OBJECTIVES

1. To compare plants and animals living in wet areas with those living in dry areas.
2. To describe different physical adaptations of various plants and animals.
3. To investigate ways that people have altered the environment for their own benefit.
4. To describe ways we use our senses to perceive information about the environment.
5. To differentiate between changes in the natural environment and changes in the man-made environment.
6. To identify natural changes in rocks, soil and water.
7. To compare and describe some rates of growth for living things.
8. To analyze seasonal and daily changes in weather and climate.
9. To explain the relationship between living things and the land they live upon.
10. To analyze the need for people to use the land in different ways.
11. To analyze the effects of pollution on plant and animal life.
12. To describe diversity within selected communities.
13. To investigate some ways that living organisms are alike.
14. To compare survival requirements for selected species of animals.
15. To describe how living things are dependent on air and water.
16. To compare ways people are dependent upon plants for food and shelter.
17. To investigate some food chains.
18. To compare the ways living organisms affect each other.
19. To analyze the ways water, air, soil and climate interact with each other.

PRIMARY ECOLOGY

From Amoeba to Alligator

Unit Code Number 147

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

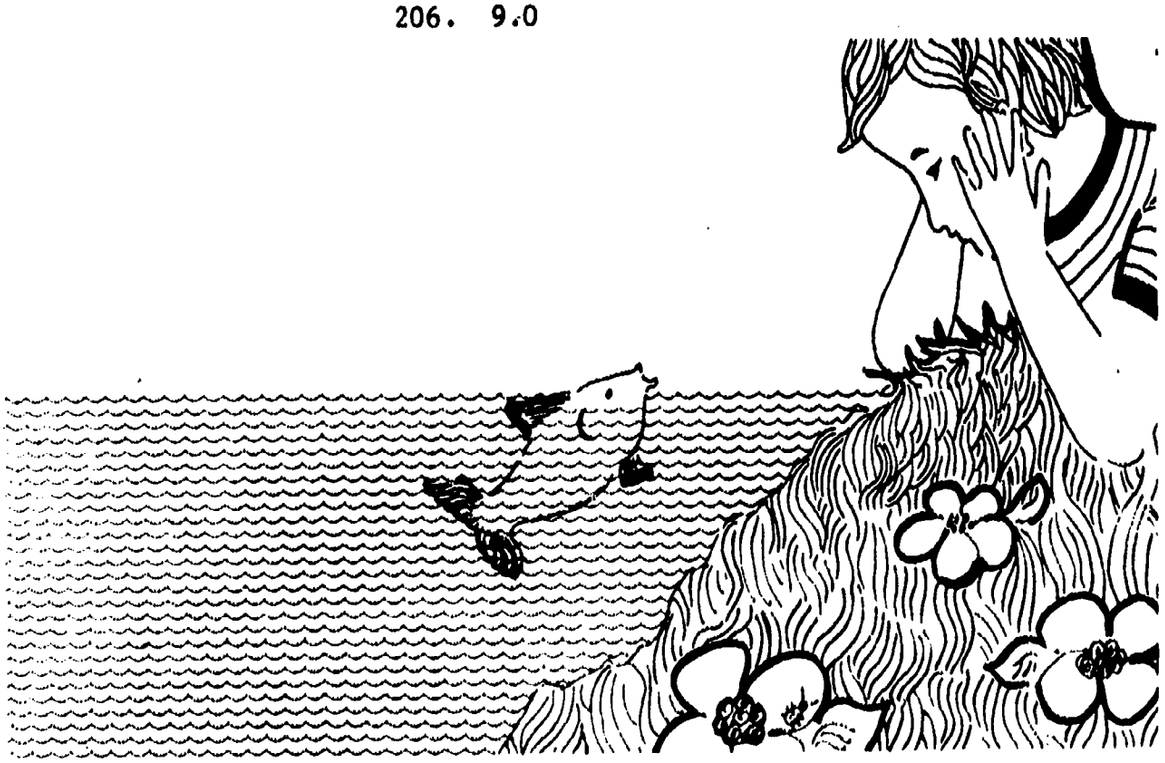
1. Air/Atmosphere
2. Animals/Zoology
3. Plants/Botany
4. Everyday Experiences
5. Earth Science/Geology
6. Creating and Construction
7. Reading
8. Music
9. Recreation/Games
10. Creative Writing
11. Adventure
12. Social Studies/History
13. Mathematics
14. Language
15. Water

Reading Level (Relative to grade level, not age level - select one)

105. Primer
106. 1
107. 1.5
108. 2
109. 2.5
110. 3

Mental Age (Select one)

202. 5.0
203. 6.0
204. 7.0
205. 8.0
206. 9.0



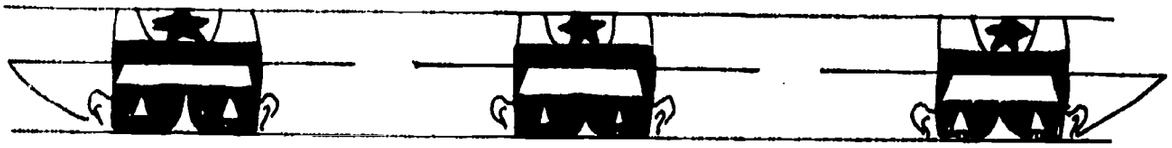
ENVIRONMENTAL LAW

Unit Code Number 148

Grades 6-12
(M.A. Range Limits - 11.0-18.0)

This unit on Environmental Legislation is designed for use with grades 6-12. It covers the history, formulation and rationale for laws in general, and environmental laws in particular. The legal aspects of pollution control in America are discussed, particularly with regard to the legislative process and enforcement proceedings. The unit examines strategies for the resolution of environmental problems at all levels of government and stresses the importance of citizen involvement.

The unique provisions of the National Environmental Policy Act are outlined and its implications for future environmental quality are assessed.



OBJECTIVES

Grades 6-9

1. To identify simple laws that help the community to function.
2. To analyze the "intent" of laws.
3. To identify jobs in which people manage or protect the environment.
4. To delineate the role of citizens in a democratic society.
5. To identify laws that seek to insure high environmental quality.
6. To trade the development of environmental regulations through modern history.
7. To analyze the biographies of people notable in the field of environmental protection and management.
8. To identify the functions of the Environmental Protection Agency in managing the environment.
9. To identify citizen action groups, other than those with governmental responsibility who publicly demonstrate concern for environmental protection.
10. To formulate procedures for the study of local environmental problems.
11. To analyze the legislative process relative to the development of environmental laws.
12. To identify the compromises necessary in setting standards and passing laws.
13. To discriminate between laws that protect environments, but limit personal freedom and laws that allow wide latitude of freedom, but require self-regulation.
14. To analyze the ways that selected environmental cases have been resolved through legal decisions.

Objectives (Cont.)

Grades 9-12

15. To determine the concepts of law and justice.
16. To formulate procedures for developing laws to attain higher environmental quality.
17. To analyze the political implications of strong environmental laws.
18. To analyze the criteria for environmental conflict resolution in various political systems.
19. To determine environmental conflicts that can be resolved by international law.
20. To develop criteria for setting priorities with respect to socio-economic-political pressures.
21. To determine constraints within which environmental protection must function.
22. To analyze how the structure of the federal government effects environmental legislation.
23. To trace the development of constraints to the free enterprise system in American history.
24. To analyze the current demand for ever-expanding technology (despite the warnings of the necessity of limits).
25. To analyze how different levels of government solve environmental problems.
26. To analyze the components of the National Environmental Policy Act.
27. To describe the role of governmental and civil agencies in carrying out the components for the National Environmental Policy Act.
28. To evaluate the effectiveness of the National Environmental Policy Act in achieving its purposes.
29. To propose a utopian model for environmental quality that includes concepts of law and justice.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1.	Agriculture	9.	Arts/Crafts
2.	Anthropology	10.	History
3.	Biography/Autobiography	11.	Philosophy/Ethics
4.	Biology	12.	Psychology
5.	Business	13.	Economics
6.	Chemistry	14.	Engineering/Technology
7.	Communications	15.	Sociology/Family Living
8.	Earth Science/Geography	16.	Creative Writing

Reading Level (Relative to grade level, not age level - select one)

113.	6	115.	8	117.	10	119.	12
114.	7	116.	9	118.	11		

Mental Age (Select one)

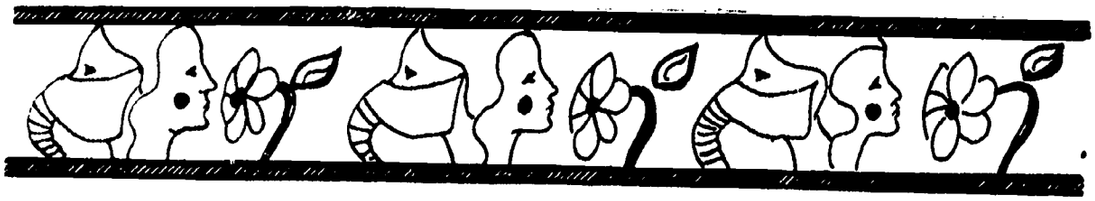
208.	11.0	210.	13.0	212.	15.0	214.	17.0
209.	12.0	211.	14.0	213.	16.0	215.	18.0

ENVIRONMENT AND PUBLIC HEALTH

Unit Code Number 065

Grades K-12
(M.A. Range Limits - 5.0-18.0)

Man has the ability to destroy or preserve the earth's beauty and goodness, or he can thoughtlessly devastate the surface, pollute the water and despoil the atmosphere. As Pogo said, "I have met the enemy and he is us." Hopefully, man's mind and energy are capable of making him do a flip-flop and look at the environment with new awareness, effectively planning to make his habitat a healthy one. Potentially hazardous elements are identified in this unit, and ways in which individuals, families, agencies and communities can work to preserve the environment are analyzed. The work of public health agencies is particularly stressed.



OBJECTIVES

1. To define the basic concepts relating to the environment.
2. To analyze how the senses contribute to our awareness of environmental conditions.
3. To identify the elements within the natural environment that have the potential for being harmful.
4. To identify the potentially hazardous elements in our environment that are consequences of human influence.
5. To describe how man can protect against the various harmful effects of the environment.
6. To illustrate the physical limitations of our natural resources.
7. To define the need for being able to work with others to maintain a healthful environment.
8. To cite examples of actions that demonstrate the responsibility of the individual for preserving and enhancing the quality of his environment.
9. To analyze the role of the people in the family, school, community, and nation that cooperate to protect the environment.
10. To analyze the role of private and public agencies in promoting higher levels of health.
11. To demonstrate an understanding of the concept of ecological balance.
12. To analyze the relationship between man and his environment.
13. To explain how man has the ability to destroy or preserve the earth's beauty and benefits through thoughtless exploitation or effective planning and constructive action.
14. To describe how the contamination of the environment through abuse is a genuine threat to man's health and future existence.

ENVIRONMENT AND PUBLIC HEALTH

Unit Code Number 065

Objectives (Cont.)

15. To explain the effects of man's increasing consumption of an environment of finite natural resources.
16. To identify the potentially dangerous chemical and physical elements in our environment.
17. To identify the disease-causing organisms and pests which are dangerous to man.
18. To identify the health agencies, health services and programs intended to maintain and improve the environment.
19. To contribute to the enhancement of a healthful environment through positive actions.
20. To participate in responsible social action related to a healthful environment.
21. To delineate the nature of public health practice.
22. To trace the influence of history in establishing foundations for the extensive public health practices which exist today.
23. To analyze the kinds of public health problems which exist today and why they have become major problems.
24. To explain the changes which have occurred in the nature of health problems and the need to deal effectively with them on a group basis.
25. To differentiate between health problems which are more personal in nature and others which are the concern of the whole community.
26. To become involved in ways of making the future a more healthful time to live.
27. To explain the attitudes and actions of governments relative to our major environmental and public health problems.
28. To analyze the essential principles of epidemiology and ecology which are relevant to public health affairs.
29. To describe the complexities involved in the improvement of the environment and in the control of sanitation practices.
30. To analyze the complex health problems related to community health practices.
31. To explore possible solutions to present and future environmental and public health problems.
32. To become involved in improving the environment.
33. To develop an appreciation of the necessity for each individual to conserve and utilize our resources (including human) most effectively.
34. To analyze the methods used in public health research.
35. To analyze the complexities that exist in the concept of the biosphere.

ENVIRONMENT AND PUBLIC HEALTH

Unit Code Number 065

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1.	Philosophy	16.	Earth Science	35.	Geography
2.	Psychology	17.	Mathematics	36.	History
3.	Logic	18.	Physics	37.	Sports/Leisure
4.	Morals	20.	Biological Science	38.	Social Science
6.	Political Science	21.	Engineering	39.	Physical Science
7.	Economics	22.	Agriculture	40.	Natural Science
8.	Law	23.	Domestic Science	43.	Art
9.	Education	24.	Other Places	44.	Creative Writing
10.	Commerce	25.	Animals	47.	Early Days
11.	Everyday Experiences	27.	Natural Phenomenon	48.	Modern Wonders
13.	Language	28.	Creating/Construction	51.	Automobiles
15.	Chemistry	30.	Photography	52.	Transportation

Developmental Tasks for Middle Childhood (Select 1 or 2)

75. Building wholesome attitudes toward oneself as a growing organism.
76. Learning to get along with age-mates.
78. Developing fundamental skills in reading, writing and calculating.
79. Developing concepts necessary for everyday living.
80. Developing conscience, morality, and a system of values.
81. Achieving personal independence.
82. Developing attitudes toward social groups and institutions.

Developmental Tasks for Adolescents (Select 1 or 2)

83. Achieving new and more mature relations with age-mates of both sexes.
85. Achieving emotional independence from parents and other adults.
87. Selecting and preparing for an occupation.
88. Developing intellectual skills and concepts necessary for civic competence.
89. Desiring and achieving socially responsible behavior.
90. Preparing for marriage and family life.
91. Acquiring a set of values and ethical system as a guide to behavior.

Reading Level (Relative to grade level, not age level - select one)

103.	Non-reader	110.	3	114.	7	118.	11
104.	1.5	111.	4	115.	8	119.	12
108.	2	112.	5	116.	9		
109.	2.5	113.	6	117.	10		

ENVIRONMENT AND PUBLIC HEALTH

Unit Code Number 065

Instructional Variables (Cont.)

Mental Age (Select one)

202.	5.0	206.	9.0	210.	13.0	213.	16.0
203.	6.0	207.	10.0	211.	14.0	214.	17.0
204.	7.0	208.	11.0	212.	15.0	215.	18.0
205.	8.0	209.	12.0				

Chronological Age (Select one)

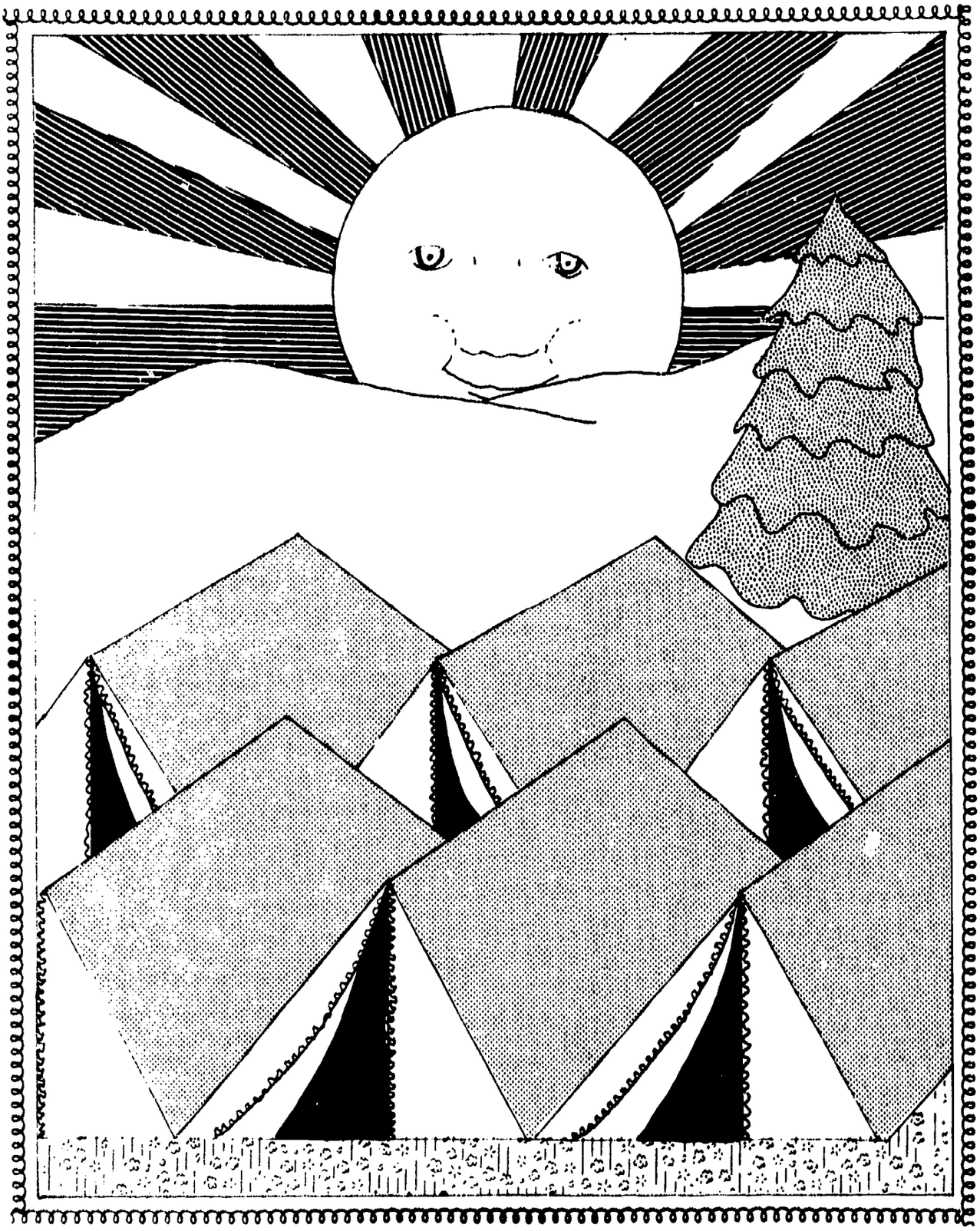
226.	5.0	229.	8.0	232.	11.0	235.	14.0	238.	17.0
227.	6.0	230.	9.0	233.	12.0	236.	15.0	239.	18.0
228.	7.0	231.	10.0	234.	13.0	237.	16.0		

Physical Handicaps (Select as many as appropriate)

244.	Partially Sighted	246.	Hard of Hearing
245.	Deaf	247.	Gross Motor Disability
		248.	Fine Motor Disability

Learning Environment (Select 1 or 2)

258.	Classroom	259.	Outdoors



IT'S IN TO BE OUT

Unit Code No. 120

Grades 2-12
(M.A. Range Limits - 7.0-Above 20)

It is important to remember that the freedom to swing my arm ends where your nose begins. Here is a unit that helps explain basic facts like that in the context of the child's real world. The whole focus is on the growth of self as the child discovers his physical and personal capacities, growth of social skills as he learns to interact with others, and growth of academic skills as he learns to meet the challenges of new problems. Even if the class does not go on an actual camping trip, there is much here that is exciting and helpful in areas where children and teachers are reaching out.

OBJECTIVES

Basic Camping Skills

1. To demonstrate the use of outdoor ethic.
2. To demonstrate the necessary safety aspects of outdoor activity.
3. To determine necessary equipment for varying outdoor experiences.
4. To organize appropriate menus for the time spent out-of-doors.
5. To plan basic food lists necessary for varying outdoor experiences.
6. To determine necessary equipment for cooking according to environmental conditions.
7. To determine necessary clothing for particular activities and season.
9. To set up shelter according to climatic and geographic conditions.
10. To build shelters from basic items attainable in out-of-doors.
11. To build a fire under various environmental conditions.
12. To demonstrate understanding of rope work.
14. To identify edible plants and food in environment.
15. To create tools using materials found in the out-of-doors.
16. To utilize the basic orientation skills.
18. To demonstrate responsible care of property - his own and others.
33. To construct craft items from materials found in the out-of-doors.

Social Skills

19. To utilize cooperative techniques in solving common problems related to living in the out-of-doors.
20. To discriminate between socially acceptable and unacceptable behavior in varying environments.
21. To identify basic human needs in a primitive situation.
22. To analyze elements of a social community.
23. To utilize time effectively when engaged in outdoor activities.

Objectives (Cont.)

Academic Skills

24. To apply science skills in interpreting natural phenomena.
25. To describe the consequences of man's effect on his environment.
26. To apply math skills in solution of problems encountered in outdoor experience.
27. To define communication skills within the context of outdoor experience.

Personal Skills

28. To demonstrate self-reliance by utilizing one's abilities.
29. To demonstrate ability to cope with unique situations.
30. To differentiate between real and imaginary fears.
31. To respond to emergencies in a rational way.
32. To complete tasks out-of-doors.

INSTRUCTIONAL VARIABLES

Student Interests (Select 4-6)

1. Agriculture
5. Biology
6. Botany/Zoology
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts
15. Home Economics
16. Mathematics
23. Education
24. Engineering/Technology
26. Sociology/Family Living
27. Sports/Recreation
30. Medicine/Health
31. Adventure

Developmental Tasks for Middle Childhood (Select 2 or 3)

74. Learning physical skills necessary for ordinary games.
75. Building wholesome attitudes toward oneself as a growing organism.
76. Learning to get along with age-mates.
78. Developing fundamental skills in reading, writing, and calculating.
79. Developing concepts necessary for everyday living.
81. Achieving personal independence.

Developmental Tasks for Adolescents (Select 1 or 2)

85. Achieving emotional independence from parents and other adults.
88. Developing intellectual skills and concepts necessary for civic competence.

IT'S IN TO BE OUT

Unit Code No. 120

Instructional Variables (Cont.)

Reading Level (Relative to grade level, not age level - Select one)

103.	Non-Reader	112.	5
104.	Pre-Primer	113.	6
105.	Primer	114.	7
106.	1	115.	8
107.	1.5	116.	9
108.	2	117.	10
109.	2.5	118.	11
110.	3	119.	12
111.	4	120.	Above 12

Mental Age (Select one)

204.	7.0	212.	15.0
205.	8.0	213.	16.0
206.	9.0	214.	17.0
207.	10.0	215.	18.0
208.	11.0	216.	19.0
209.	12.0	217.	20.0
210.	13.0	218.	Above 20
211.	14.0		

Chronological Age (Select one)

228.	7.0	236.	15.0
229.	8.0	237.	16.0
230.	9.0	238.	17.0
231.	10.0	239.	18.0
232.	11.0	240.	19.0
233.	12.0	241.	20.0
234.	13.0	242.	21.0
235.	14.0		

Physical Handicaps (Select as many as appropriate)

243.	Blind	246.	Hard of Hearing
244.	Partially sighted	247.	Gross motor disability
245.	Deaf	248.	Fine motor disability

Learning Environment

258. Classroom
259. Outdoors

MEMORANDUM

To: The Teacher

From: The New Jersey State Council for Environmental Education

Subject: Use of Your Computer Based Resource Guide

The resource guide which you receive is designed to serve you as a planning guide for developing an environmental education teaching unit at the elementary or secondary level. The information and format have been organized to enable you to apply the guide in many different ways to achieve the educational goals of your students.

There are five basic components within the Computer Based Resource Guide; learner objectives, content, activities, measuring devices and an annotated list of supplementary references. The objectives in your guide will be those which you and your students selected, based on individual interests and concern for environmental issues. The student variables, such as Mental Age, Reading Level, and Student Interests, which you enter on the request form, provide the basic information for the computer to tailor the guide to the needs of your specific class and/or individuals for whom it was requested. Most teachers have found that planning is more interesting and greatly expedited when students assist in the selection of the objectives and indicate their own interests.

The content component provides background material, information and knowledge related to the objectives which you have selected, and is summarized for your use. You may, of course, share it with the class, if you wish. The purpose of the content component is to furnish you with the basic facts and thus conserve your time and energy in gathering the essential unit content materials.

Activities are the heart of your Computer Based Resource Guide. They vary in kind, from games, simulations and role playing, to essays, book reports, drawing diagrams or making models, but are always related to the environmental topic being considered. They are designed for use with large and small groups and for individualized instruction. Activities are adaptable to pupils with a wide degree of individual differences and can be used in a wide variety of situations. They can be modified, expanded or contracted, as you and your students desire.

Measuring devices are very much like activities, but emphasize evaluation. Although there are some paper and pencil tests, most measuring devices require the student to do something which reflects his new knowledge or changed attitude. They are used to evaluate pupils at their own level of intellectual development, rather than comparing them to class norms.

Reference materials comprise the last component of the Computer Based Resource Guide. This is an annotated list of supplementary materials, such as films, filmstrips, books, records, pamphlets, etc., relevant to the environmental subject being covered. The Computer Based Resource Guide is not dependent on the reference list. You may teach without it, but if you want to expand the unit or introduce new elements, the list provides for this flexibility.

At the end of the Computer Based Resource Guide there is a Teacher Evaluation Form. We urge you to complete this form and return it to The New Jersey State Council for Environmental Education. Only with your help can the Computer Based Resource program be improved.