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#### **ABSTRACT**

To some educators, infusing environmental education into different subject areas at different levels may seem like an insurmountable task. This handbook was developed to take the guesswork out of this process and alleviate the fear and confusion that may result. It was designed to essist with infusing knowledge, skill and attitude activities into the classroom, correlate widely used curriculum supplements with the objectives and principles in the Wisconsin Department of Public Instruction's environmental education guide, and simplify the infusion process using proven and effective activities. Activities are categorized by subject areas, grade levels, environmental education objectives, and ecological principles. Major resources coordinated in this volume include: (1) "Project Learning Tree"; (2) "Project WILD"; (3) "Living Lightly on the Planet"; (4) "Investigating and Evaluating Environmental Isques and Action Skill Development Mudules"; and (5) "CLASS Project." The \*Fundamental Environmental Principles\* are enumerated. Appendices include a "Grades 7-9 Appendix" and environmental education resources. (CW)

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- \* Reproductions supplied by EDRS are the best that can be made
  - from the original document.



# Avoiding Infusion Confusion

A Practical Handbook for Infusing Environmental Activities into your Classroom

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Additional copies of <u>Avoiding Infusion Confusion</u> are available for grades K-3, 4-6, 7-9, and 10-12. Write or call:

Central Wisconsin Environmental Station 7290 County MM Amherst Junction, WI 54407 (715) 824-2428

(See order form at the end of this handbook.)



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Thanks also to Barb Jenson and Sue Cox for their assistance in typing this handbook.

Special thanks to Jane Dumke, Kathy Mehne, and Jennifer Schoch of the Computing Information Center, University of Wisconsin-Stevens Point, for their tremendous effort in helping us complete this handbook. Their cheerfulness and willingness to help was very much appreciated.



#### INTRODUCTION

"Environmental education should permeate the entire curriculum with every subject area at every grade level dealing with the environment in some way," according to the Wisconsin Department of Public Instruction's A Guide to Curriculum Planning in Environmental Education. To some educators this may seem like an insurmountable task, especially to those unfamiliar with what environmental education has to offer. To help simplify the process of infusing environmental education activities into your present curriculum, we have developed a handbook that takes the guesswork out of this process and alleviates the fear and confusion that may result.

#### What is "Avoiding Infusion Confusion"?

It is a handbook designed to...

... assist educators with infusing environmental education activities into the classroom.

...correlate widely used curriculum supplements with the objectives and principles in the DPI's A Guide to Curriculum Planning in Environmental Education

...simplify the infusion process utilizing proven and effective activities.

#### How is it used?

The format is designed for quick reference. Activities are categorized by subject area. They are also coordinated with grade level, environmental education objective and ecological principles.

#### Why was this handbook written?

It was written to assist...

...school districts in developing a program for the infusion of environmental education into Wisconsin Public School curricula as required by state mandate.

...individual teachers in selecting appropriate activities best suited for their classroom situation.

...educators in developing a systematic approach to infusion that will help reduce preparation time.

By infusing environmental education activities into every subject area in our school systems and in our student's everyday lives, we are increasing their knowledge, and appreciation of the natural environment. We are also insuring that students will be better equipped to make responsible decisions when faced with environmental issues. The task of infusing environmental education may seem like a tall order, but we're sure you'll agree that it's well worth the effort. Good luck!



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## **Objective Categories**

## Grade-Level Emphases on Environmental Education Objective Categories

Level	Major Emphasis	Minor Emphasis
	Awareness	Knowledge
K-3	Attitudes	Skills
į		Participation
	Knowledge	Awareness
3-6	Attitudes	, Skills
	,	Participation
	Knowledge	Awareness
6-9	Skills Attitudes	Participation
	Skills	Awareness
9-12	Participation	Knowledge
	Attitudes	

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We have divided our handbook into four separate parts, according to grade levels. The four are: K-3, 4-6, 7-9, and 10-12. Piaget's levels of intellectual development illustrate the importance of teaching basic skills and concepts to young children, and moving towards more challenging activities. This is reflected in a changing degree of emphasis on each objective category for each of the four grade-level groups. As an administrator or teacher, you will want to know what to emphasize with your students and what will be emphasized in other grades, as well as your own. This will insure that each program has sequence, and each student has consistency from year to year.



#### How to use this Handbook

This handbook combines activities contained in selected, widely used environmental education programs, and the principles developed by the Department of Public Instruction (DPI) in its Guide to Curriculum Planning in Environmental Education. The activities are organized by: principle number, the environmental education resource, (i.e. Project WILD) and the appropriate content areas (i.e. Language Arts).

As you use this handbook, you will notice that the distribution of activities among the principles and the content areas, is not always equal. The environmental education programs chosen, did not always contain activities that could be used to teach every one of the principles developed by the DPI. In addition, activities were not always appropriate for use in every one of the five content areas. By filling in the blank boxes with activities you are familiar with and know to be suitable for that principle, content area, and grade level, the handbook becomes a personalized, timesaving device for infusing environmental education into your lesson plans and curriculum. A list of additional resources has been provided at the end of this handbook.

## **Organization of the Materials**

Each principle taken from the DPL Guide to Curriculum Planning in Environmental Education is listed by number at the top of the left-hand page. Each of these numbers corresponds to an abridged version of the DPI's principles found on pages 5-8 of this handbook. The complete unabridged list of principles may be found in the DPI guide on pages 13-22.

At the top of each right-hand page you will also find a list of concepts. These concepts summarize the principles and are designed as a quick reference to the major points of the corresponding principle.

Environmental education resources are listed in the left hand column. Activities from each of these resources are organized according to the content area they relate to. This handbook is limited to the five content areas of Art, Health, Language Arts, Science, and Social Studies. The DPI has singled out these content areas because they most readily lend themselves to the process of infusion.

Activities were analyzed and placed in a particular box or series of boxes based on how well they teach a principle or concept. This is a subjective process to some degree. You may find that by actually conducting an activity in the classroom or outdoors that you feel it belongs with another principle or content area. One of the strengths of this handbook is its adaptability to your needs and situation.

A maximum of five activities are listed in each box. An asterisk inside a box indicates that there are additional activities listed in the appendix beginning on page 83. To find these overflow activities, turn to the appendix and locate the number of the principle you are working with (far left column). Once you have found the correct principle number, nork from left to right and locate the content area, the environmental education resource you are using, and finally, the list of activities in the right column. The activities are arranged by the page number where they are found in the environmental education resource.

In addition to the appendix and resource section, a concept index is located at the back of this handbook. The concepts are arranged individually and in alphabetical order. If you wish to teach a particular concept and need a good activity, simply turn to the concept index and it will list the page in the handbook where this concept can be located. Please note: not all of the activities teach each of the concepts listed. You will need to look at the individual activity to determine if it teaches the concept, principle or idea you had in mind.



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## Finding an activity in this handbook: An Example

Imagine that you are a seventh grade Language Arts teacher planning a lesson that incorporates the ecological concept of interdependence. You would like to use an activity that would help illustrate this concept and would be appropriate for the grade level and subject area that you are teaching. You have a number of environmental education resources (i.e. Project Learning Tree) but you have not had a chance to use them extensively in the classroom. Along with your other materials you have this exciting new handbook that is designed to simplify the process of infusing environmental education into your lesson plans.

- Step 1. Turn to the "Concept Index" in the back of this handbook under "Interdependence" listed alphabetically. Next to the concept is the principle number and the page number it is located on. You may use either the principle number or the page number to locate this concept.
- Step 2. After finding the page number and/or principle number, turn to the Environmental Activities Section and locate the appropriate page. You will find the concept (possibly along with others) at the top of the right page.
- Step 3. Locate the environmental education resource you would like to use from those listed in the left column.
- Step 4. Move across the row of boxes until you are beneath the correct content area. This box may contain a list of activity titles and page numbers. An empty box means that there was not an appropriate activity in the environmental education resource for this subject area and concept. If one or more activities are listed, turn to the environmental education resource that you are using and check to see if the activity teaches the concept you are interested in. Remember that an asterisk in the box indicates additional activities for these concepts and this environmental education resource are located in the appendix of this handbook.



## Fundamental Environmental Principles\*

Concept	<b>Principle</b>	I.			
Course			A.	Eart cart	th's environment operates as a system supported by conditions that are functions of h's structure and place in the solar system.
Solar Energy	(1)			1.	Solar energy is the primary source of energy for all biogeochemical cycles and other processes occurring on earth.
Secondary Energy Sources	(2)			2.	Nuclear processes, geothermal sources, tidal movements, and gravity are secondary sources.
Earth's Energy Balance	(3)			3.	The earth is in a state of overall energy balance, absorbing energy from the sun and radiating it into space.
Weather & Climate, Water Cycle, Biosphere	(4)			4.	Absorption and distribution of solar energy results in the movement of global air masses, the hydrologic (water) cycle, and ocean currents, giving rise to earth's prevailing weather and climates and providing conditions essential to life on earth.
Oceanography			В.	Ea:	th's environment is a complex, interrelated, interactive, dynamic, constantly changing crosystem called the ecosphere.
Decomposition, Erosion Habitat, Interaction, Interdependence, & Niche	(5)			1.	The ecosphere is composed of a mosaic of intereacting systems called ecosystems.
Adaptations, Change, Camouflag Continental Drift, Diversity, Evolution, & Succession	e, (6)			2.	The ecosphere has and is undergoing continuous change.
Biogeochemical Cycles, Energy Transfer, Food Webs, Photosynthesis, Renewable Resources, & Respiration	(7)			3.	Energy and materials required for life pass into or are found in the ecosphere, and are components of each ecosystem.
Birth-Death Rate, Carrying Capacity, Homeostasis, Human Population Growth, Limiting Factors, & Population	(8)			4.	the size and stability of which vary, depending on biotic and abiotic changes in the system.
માં ની				•	Reprinted and revised with permission from the Wisconsin D.P.I.  Outline based on 1976 Federal Interagency Committee on Education Report.

<u>Concept</u>	. <u>Principle</u>	II. Funda	amental Principles Dealing with Humans as Ecosystem Components
		<b>A.</b> 1	Humans use ecosystems to satisfy basic needs and desires.
Biological Needs of Humans	(9)	1	<ol> <li>Basic biological needs that must be met for humans to live and grow include habitable climate, energy, materials, rest and exercise, other humans for reproduction, and protection against environmental stress.</li> </ol>
Psychological Needs of Humans	(10)	2	2. Humans cannot grow and completely develop mentally unless essential psychological and social needs and desires are met. These include security, love, esteem, self-fulfillment, social interaction, health, comfort, material goods, and religious experiences.
Use of Materials and Energy, Cultural Attitudes, Values, & Pollution	(11)	3	B. Each human culture has its own perceived needs and desires that make different demands and impacts on ecosystems. In times of stress many of these needs and desires can be adjusted.
			Humans are an all-pervasive species in the ecosphere and thus exert a special ecological dominance.
Human's Ecological Domination of Earth	(12)	:	Human domination results from various factors which includelarge intellectual capacity, adaptation to a wide range of environmental conditions, large population size, specialization in diversity of labor.
Effects of Humans on Ecosystems Social Interaction	(13)	:	2. Human tendencies to form and function in social and corporate groups and institutions promote development of human habitats that create unique concentrated demands on ecosystems and further increase human effects on ecosystems.
Human Population Growth and Technology and its Effects on Ecosystems	(14)	:	3. Recent rapid increases in human populations and technological capabilities have accelerated ecosystem changes until some are potentially irreversible.
Effects of Values on Human Behavior-Impacts on Ecosystems	(15)	4	4. Human aesthetic, ethical, moral, and spiritual values may reinforce or conflict with harmonious relationships within ecosystems.
		<b>C.</b> 1	Ecosystems affect humans
Built Environments are Influenced by Ecosystems	(16)	;	1. Humans and all their products function in an ecosystem framework.

Concept	<u>Principle</u>		
Ecosphere Changes Due to Human Population and Technology Nonrenewable Resources	n (17)	2	Ecosphere changes due to increasing human population and technology have both short and long term effects.
Physical and Chemical Components of Ecosystems: Effects on Humans	(18)	3	The built environment and its psychological miliea have a powerful effect on humans. Information transfer by verbal comunication and learned behavior operates on humans in a parallel and synergistic manner in much the same way as do physical and chemical components of ecosystems.
		<b>D.</b> C	Complex interactions among humans and other ecosystem components occur continuously.
Human Needs and Values: Effects on Ecosystems	(19)	1	Humans' perceptions of their needs, their impacts on ecosystems, and ecosystem impacts on them, reflect the cultural and individual values, goals, skills, insights, and capabilities of the individuals, groups, institutions, and nations involved.
Interrelationships	(20)	2	Relationships among components of ecosystems are reciprocal, ranging from mutually beneficial to unidirectionally destructive:
Feedback Mechanisms of Ecosystems	(21)	3	Feedback mechanisms of different kinds, for xample physical, chemical, social, behavioral, ranging from rudimentary to highly sophisticated, govern relationships among and within components of ecosystems.
Synergistic Effects	(22)	4	Human activities often have synergistic effects on ecosystems and visa versa.
Appreciating Ecosystems and their Components, Appreciating the Environment, Human Impacts on Ecosystems	(23)	.5	Human activities affect ecosystem maintenance and management.
	III.		ods for Harmonizing Human Activities with Ecosystem Processes to Achieve onmental Quality
		A. !	Methods by which human activities, local through global, are harmonized with ecosystem processes are complex, and outcomes are not always predictable.
Barriers to Ecosystem Harmony	(24)	1	Barriers to harmony includeeffects of ecosystem changes, lack of knowledge needed to make environmental predictions, and lack of uniformly dependable social-political cooperation.

Concept	<u>Principle</u>				
Methods to Attain Harmony	(25)		2.	Harmony can be pursued througheducation, environmental art, citizen action voluntary and formal policies, economic and social incentives, and enforceme policies.	
Methods to Promote Harmony	(26)		3.	Institutions, processes, and attitudes for promoting harmony includeeducati communication, ethical, moral and other influences, science and technology, social institutions, government and political processes, industry and commerce	civic and
		В.		sic procedure for harmonizing human activities with ecosystem processes can cribed as a series of steps.	be
Investigation of Ecosystems	(27)		1.	Investigate ecosystem processes and components, including the effects of hun activities on ecosystems and the inflluences of ecosystems on human function	
Importance of Ecosystem Processes and Changes	(28)		2.	Recognize the importance of ecosystem processes and the significance of ecochanges.	system
Causes of Ecosystem Changes and their Consequences	(29)		3.	Identify the causes of ecosystem changes and their consequences.	
Action Strategies	·(30)·		4.	Develop alternative action strategies to maintain and enhance beneficial ecos changes and to reduce detrimental changes, with special attention to irreversi changes and to long range versus short range commitments of resources.	
Analyzing and Evaluating Alternative Action Strategies	(31)		5.	Analyze and evaluate alternative action strategies within a broad array of environmental, social, and economic criteria, recognizing that criteria will diff according to circumstances of politics, geography, scale, time and society.	fer
Adopting Action	(32)		6.	Select among alternative action strategies, and adopt a policy which can be implemented at all levels, individual through global.	
Implementing Action Strategies	(33)		7.	Decide on and complete actions to implement the policy.	
Monitoring and Evaluating Policies	(34)		8.	Monitor and evaluate affects of the implemented policy.	
Monitoring Feedback and Adjusting Actions as Necessary	(35)		9.	Feeding information gained in Principle 34 back through Principle 27 to adjust to changing data bases, requirements, conditions, and perceptions.	st actions
Adjacims without as recessary				to changing data bases, joquitements, conditions, and perceptions.	18

## Where to Obtain the Environmental Education Resources used in this Handbook:

#### The CLASS Project

Margaret Rosenberry and NWF staff. Published by and available from National Wildlife Federation, 1412 Sixteenth Street, Washington, D.C. 20036, 1982.

#### Investigating and Evaluating Environmental Issues and Actions Skill Development Modules.

Harold R. Hungerford, Ralph A. Litherland, R. Ben Peyton, John M. Ramsey, Audrey N. Tomera, and Trudi L. Volk. Champaign, IL. Stipes Publishing Company, 1985

#### Living Lightly in the City for Grades K-3 and 4-6.

Maura O'Conner, 1985

#### Living Lightly on the Planet for Grades 7-9 and 10-12

Maura O'Conner and Kathy McGlauflin, 1982, 1984. Published and available from the Schiltz Audubon Center, 1111 East Brown Deer Road Milwaukee, WI, 53217

#### Nature with Children of All Ages

Edith Sisson. Published by Englewood Cliffs of NJ in 1982. Available through bookstores.

#### Project Learning Tree: Supplemental Activity Guide for Grades K-6 and 7-12.

Western Regional Environmental Education Council and the American Forest Institute. Published by the American Forest Institute, Washington D.C. in 1975. Available only through a six hour workshop offered throughout the state. Contact Project Learning Tree, Wisconsin DNR, P.O. Box 7921, Madison, WI 53707.

#### Project WILD: Elementary and Secondary Guides.

Western Regional Environmental Education Council. Published in 1985. Available only through cosponsoring states at six hour teacher workshops. Contact Project WILD, Wisconsin DNR, P.O. Box 7921, Madison, WI 53707.

#### Sharing Nature With Children

Joseph Bharat Cornell. Published by Ananda Publications of Nevada City, CA in 1979. Available through bookstores.

#### A Guide to Curriculum Planning in Environmental Education

Wisconsin Department of Public Instruction. Published by and available from the Wisconsin Department of Public Instruction, 125 South Webster Street, P.O. Box 7841, Madison, WI 53707



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## **Environmental Activities Section**

## **Environmental Activities Section**

Environmental	Content Areas				
Education	• • •	w# 1.1			
- Resources		Health			
CLASS Project	Energy Mternatives p.15				
Project Learning Tree (Secondary)					
Project WILD (Secondary)					
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)					
Living Lightly on the Planet					



Concept: Solar Energy

#### Content Areas

Language Arts	Science	Social Studies
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	Food Mobile p. 129 A Treasure Huntfor Energy p. 135	A Treasure Huntfor Energy p. 135
The Day the Cycles Stood Still p. 88	Outer Limits p. 15 Building a Mini-Ecosystem p.81 The Day the Cycles Stood Still p. 88	Outer Limits p. 15
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Environmental	Content Areas		
Education Resources	Art	Health	
CLASS Project	Energy Alternatives p.15		
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Project Learning Tree (Secondary)			
Project WILD (Secondary)			
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)			
Living Lightly on the Planet	•		



Environmental Education	Content	Areas
- Resources	Art	Health
ı CLASS'Project		
Project Learning Tree (Secondary)		
Project WILD (Secondary)		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		
Living Lightly on the Planet		



Environmental Education	Content	Areas
- Resources	Art	Health
ı CLASS'Project		
Project Learning Tree (Secondary)		
Project WILD (Secondary)		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		
Living Lightly on the Planet		



#### Content Areas

Language Arts	Science	Social Studies
<del>-</del>		
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,	Outer Limits p. 15	Outer Limits p. 15
	Outer Dilling p. 13	Outor minito p. 10



Environmental:	Gòn	Göntent Areas		
Education: Resources:	Arti	Hèalth		
CLASS Project				
Project Learning Tree (Secondary)	How Paper is Made: p. 24			
Project WILD (Secondary)				
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI);				
Living Lightly on the Planet				



Concept:

Weather & Climate Water Cycle Biosphere Oceanography

#### **Content Areas**

<u>.</u>	Concent Areas	
Language Arts	Science	Social Studies
	The Gentle Rain p. 29 The Earth's Sponge p. 51 Are There Any Clearcut Answers? p. 53 Locating Wetlands p. 79 Wildlife Where You Live p. 97	The Gentle Rain p. 29
	Nature's Air Conditioner p. 17 Snow Use p. 92 Water We Doing? p. 94 Why do Trees Grow There? p. 115	Snow Usc p. 92 Water We Doing? p. 94 Why Do Trees Grow There? p. 115
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Education		4.4	
Resources	Art	Health	
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Project Learning Tree (Secondary)	How Paper is Made p. 24 The Continuing Adventures of the Truffle Tree Company p. 165		
Project WILD- (Secondary)	Improving Wildlife Habitat in the Community p. 131		
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Living Lightly on the Planet	A Self-Supporting Super Species p. 89		



Concept: Interaction
Interdependance
Habitat
Niche

Decomposition Erosion

#### **Content Areas**

Language Arts	Science	Social Studies
AS·Pen Pals p. 49 A Place Endangered p. 101	Who Planted the Maple on Elm Street? p. 47 The Earth's Sponge p. 51 Exploring Wetlands p. 81 Making a Place for Wildlife p. 93 Fowl Play p. 101	Exploring Wetlands p. 81 Key Mangrove: A System in Conflict p. 83 A Place Endangered p. 101
A Letter From Archy p. 44 For Better or For Worse p. 99 The Continuing Adventures of the Truffle Tree Company p. 165	A Letter From Archy p. 44 Soil Compaction p. 83 Wildlife Habitat p. 117 Succession of the School Grounds p. 130 How Do You Bury a Pile of Dirt? p. 131 *	How Clean is Clean? p. 101 Mining & Renewable Resources p. 103 Hard Choices p. 106 Endangered Species p. 124 How Do You Bury a Pile of Dirt? p. 131
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<sup>\*-</sup>See Appendix for Additional Activities

Environmental	Content Areas		
Education Resources	Art	Health	
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Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)			
Living Lightly on the Planet	A Self-Supporting Super Species p. 89		
te set i			

Concept: Continental Drift

Change Succession **Evolution** Diversity Adaptations Camouflage

\*-See Appendix for Additional Activities

**Content Areas** 

Language Arts	Science	Social Studies
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	Water We Doing? p. 94 Climax Forest p. 121 Succession on the School Grounds p. 130	Water Wc Doing? p. 94
Time Lapse p. 93 Who Fits in Here? p. 87 Interview with a Spider p. 7 Adaptation Artistry p. 91	Succession Transect p. 94 Interview with a Spider p. 7 Who Fits in Here? p. 87 Pond Succession p. 95 Adaptation Artistry p. 91	Pond Succession p. 95
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Énvironmental	Content Afras		
Education Resources	Årt	Health	
CLASS Project	Taking Á Clošer Look p. 43 Making á Place for Wildlife p. 93		
Project Learning Tree (Secondary)			
Project WILD (Secondary)		What's For Dinner? p. 63 Löbster in Your Lünchbox p. 233	
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)			
Living Lightly on the Planet	A Self-Supporting Super Species p. 89 A Plactic Mountain p. 100	The to we a set things on the sequence in the sec	



Concept:

Energy Transfer
Photosynthesis
Respiration
Biogeochemical cycles
Food Webs
Renewable resources

\*-See Appendix for Additional Activities

#### **Content Areas**

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Environmental Education	Content Areas		
Resources	Art	Health	
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Project Learning Tree (Secondary)			
Project WILD (Secondary)			
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)			
Living Lightly on the Planet			



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Concept:

Population
Birth/Death rate
Human population growth
Carrying capacity
Homeostasis Limiting factors

<sup>\*-</sup>Scc Appendix for Additional Activities

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Language Arts	Science	Social Studies
AS'Pen Pals p.49 A Place Endangered p. 101	Are There Any Clearcut Answers? p. 53 Fowl Play p. 101 For the Enjoyment of Future Generations p. 107 A Place Endangered p. 111 Class/Research Projects (Wildlife Habitat Mgmt) p. 112	Exploring Wetlands p. 81 A Place Endangered p. 111
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Doubling Time p. 20 From Steam Engines to Suburbs p. 38 Down on the Farm p. 46	Beyond Carrying Capacity p 10 Outer Limits p. 15 Millions and Billions p. 17 Doubling Time p. 20 Food For Thought p. 24	Beyond Carrying Capacity p. 10 Outer Limits p. 15 Millions and Billions p. 17 Doubling Time p. 20 Food For Thought p. 24 *



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Education Resources	Art	Health
CLASS Project		
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Project WILD (Secondary)	My Kingdom For a Shelter p. 65 Wild Edible Plants p. 171	
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Living Lightly on the Planet		



Concept: Biological Needs of humans

### \*-See Appendix for Additional Activities

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Language Arts	• Science	Social Studies
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Edvironmental Edlication	Content Areas	
Resources	A'nt'	Health
CLASS Project		
Project Learning Tree (Secondary)	Sylvan Serenade p. 4	
Project WILD (Secondary)		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		
Living Lightly on the Planet		



### \*-See Appendix for Additional Activities

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•		
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Principle #11.

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Resources:	Art.	Health			
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Living; Lightly, on, the, Planet	A.Plastic Mountain. p. 100				



Use of materials & energy Pollution Concept:

Cultural attitudes Values

\*-See Appendix for Additional Activities

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Artisans in Wood p. 36 The Power of Literature p. 48 Superstitions, Symbols & Similies p.50 The Continuing Adventures of the Truffle Tree Company p. 165 Wasted Words p. 54	A Day in the Life p. 43 The Value of Wildlife p. 90 Water We Doing? p. 94 Pollution Search: A "Sense" of Knowing p. 133 A Treasure HuntFor Energy p. 135 *	Native American Web of Life p. 39 The Influence of Forests on Your Region's History p. 34 Pioneers in the Wilderness p. 41 Economic Web of Life p. 46 How Clean is Clean? p. 101 *		
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Environmental Education	Content Areas			Content Areas	
Resources	Art	Health			
CLASS Project	A Place Endangered p. 111				
Project Learning Tree (Secondary)	The Continuing Adventures of the Truffle Tree Company p. 165				
Project WILD (Secondary)					
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		Environmental Problems p. 11			
Living Lightly on the Planet					



Environmental	Content Areas			
Education Resources	Art	Health		
CLASS Project	Rubbish Research p. 33 Using Topographic Maps p. 77			
Project Learning Tree (Secondary)	The Continuing Adventures of the Truffle Tree Company p. 165			
Project WILD (Secondary)	Improving Wildlife Habitat in the Community p. 131	Noisy Neighbors p. 137		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)				
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Concept: Effects of humans on ecosystems Social interactions

## \*-See Appendix for Additional Activities

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Concept: Effects of humans on ecosystems Social interactions

## \*-See Appendix for Additional Activities

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Education Resources	Art	Health		
·	Rubbish Research p. 33			
CLASS Project				
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Living Lightly on the Planet				



Concept: Human population growth & technology: its effects on ecosystem

\*-See Appendix for Additional Activities

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Resources	Art Health			
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Environmental	Content Areas			
Education Resources	Art	Health		
•				
CLASS Project				
Project Learning Tree				
(Secondary)				
Project WILD (Secondary)	Photos Keep It Happening! p. 139			
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)				
Living Lightly on the Planet	A F'astic Mountain p. 100			
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Environmental	Content Areas			
Education Resources	Art	Health		
•				
CLASS Project				
Project Learning Tree				
(Secondary)				
Project WILD (Secondary)	Photos Keep It Happening! p. 139			
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)				
Living Lightly on the Planet	A F'astic Mountain p. 100			
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Concept: Built environments are influenced by ecosystems

# \*-See Appendix for Additional Activities

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Less is More? p. 106	Outer Limits p. 15 What's Happening in Our Town? p. 44 City Lifelines: An Urban Ecosystem p. 92 A Plastic Mountain p. 100 Raters of the Planet Eco p. 103	Outer Limits p. 15 What's Happening in Our Town? p. 44 City Lifelines: An Urban Ecosystem p. 92 Raters of the Planet Eco p. 103 Recycling "Bits" p. 114
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Education

Education Resources	Art	Health
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Living Lightly on the Planet	A Plastic Mountain p. 100	

Concept: Ecosphere changes due to human population & technology Nonrenewable resources

### \*-See Appendix for Additional Activities

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Environmental  Education	Content Areas	
Resources	Äit	Health
:CLASS Project		And the state of t
Project Learning Tree		and the second s
Project'WILD (Secondary)		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		·
Living Lightly on the Planet		
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Concept: Physical & chemical components of ecosystems: their effect on humans

## \*-See Appendix for Additional Activities

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Environmental	Content Areas	
Education Resources	Art	Health
, CLASS Project	Rubbish Research p. 33	
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Project WILD (Secondary)	Photos Keep It Happening! p. 139	
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Concept: Interrelationships

# \*-See Appendix for Additional Activities

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Environmental	Content Areas	
Education	Art .	Health
Resources	Alt .	· · · · · · · · · · · · · · · · · · ·
CLASS Project	Taking a Closer Look p. 43 Exploring Wetlands p. 81 Making Place for Wildlife p. 93 A Place Endangered p. 111	3
Project Learning Tree (Secondary)		
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Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		
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!anguage Arts	Science	Social Studies
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Environmental	Content Areas	
Education Resources	Art	Health
Resources	All	
CLASS Project		
Project Learning Tree (Secondary)		
Project WILD (Secondary)		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		
Living Lightly on the Planet		



Concept: Synergistic effects

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Language Arts	Science	Social Studies
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•	Sinkholes! p. 65	
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Environmental	Content Areas	
Education Resources	Art	Health
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Concept.

Human impacts on ecosystems
Appreciation of the environment
Appreciating Ecosystems and their
Components

### \*-Sce Appendix for Additional Activities

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Environmental Education	Content Areas	
Resources	Art	Health
CLASS Project	•	
Project Learning Tree (Secondary)		
Project WILD (Secondary)		
Investigating & Evaluating Environmental Issues & Actions Development Module Skill (Modules I-VI)		Environmental Issues p. 14
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Concept: Monitoring feedback & adjusting action as necessary

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## Additional E.E. Curriculum Resources

Acclimatizing. 1972. Acclimatization. 1974.

Sunship Earth. 1979.

Steve Van Matre. Published by the American Camping Association in Martinsville, IN 46151 and the Institute for Earth Education, P.O. Box 288, Warrenville, IL 60555.

Van Matre first popularized the sensory approach to environmental study--immersing people in a swamp, blindfolding them through the forest, and digging their har Is into soil. By experiencing the environment with all of our senses, we will come to know, and appreciate it better. Acclimatizing and Acclimatization describes short activities and adventures to discover the outdoors. Sunship Earth is a carefully structured five-day residential outdoor program. The magic and discovery is still there, but with an emphasis on the larger picture of ecology and human interaction.

#### Biological Science: An Ecological Approach. Fourth ed. 1978.

Biological Sciences Curriculum Study (BSCS), Rand McNally, P.O. Box 930, Boulder, CO. An excellent secondary biology text that emphasizes ecology throughout. Picked as one of the best biology textbooks used in the nation's high schools. Eighteen books were studied by a group commissioned by People for the American Way. This was one of the three excellent textbooks which they described as "doing an excellent job of covering evolutionary theory and the field of biology.

## Central Wisconsin Environmental Resource Manual. 1981

Central Wisconsin Environmental Station (CWES), University of Wisconsin, Stevens Point, National Science Foundation Special Training Project in Ecology and Environmental Education.

Provides listings of community resources that can be used as field trips or speakers. Three volumes cover resources in the following counties: Adams, Wood, Columbia, Kewaunee, Green Lake, Sauk, Waushara, Portage, Marathon, Langlade, Lincoln, Waupaca, Clark, Oneida, Shawano, Taylor, and Winnebago. Resources have been located and analyzed and are presented in an organized format in order to provide a practical, relevant, and ready reference that can facilitate resource use by teachers at all grade levels. Focuses specifically on resource use for environmental education.

## Connections: A Curriculum in Appropriate Technology for Fifth and Sixth Grades. 1980.

Written by and available from the National Center for Appropriate Technology. Box 3838, Butte, Montana 59701.

This activity guide for elementary teachers provides exciting ideas and information in solar energy, water conservation, transportation, recycling, nutrition, and gardening--a good beginning for understanding many current issues.

#### Conserving Soil,

U.S.D.A. Soil Conservation Service. Published and distributed in 19... Currently available from the National Association of Conservation Districts Service Dept., P.O. Box 855, League City, TX 77573-9989.

Color transparencies, ditto masters, activities, and background information help teachers convey information about soil and its wise use.

#### The Cousteau Almanac: An Inventory of Life On Our Water Planet.

Jaques Ives Cousteau and Cousteau Staff. Published by Doubleday Company in New York, 1981. Available through bookstores.



The Almanac is a treasure of information on environmental issues around the world in the 1980's. Articles are well written, well documented, and arranged in a unique order. Scattered throughout are vignettes of people and organizations who work toward the solutions to environmental problems, usually on a local level, and usually successfully. The last section provides information on organizing around an issue and taking action.

Environmental Science: An Introduction. Second edition.

Living in the Environment. Fourth edition.

G. Tyler Miller. Published by Wadsworth Publishing Company in Belmont, CA. 1986. Available as text.

Both texts fairly represent the variety of perspectives that color environmental issues. <u>Environmental Science</u> covers the issues in less depth than <u>Living in the Environment</u>. Written for college students.

Environmental Science: Managing the Environment. Second edition.

P. Walton Purdom and Stanley H. Anderson. Merrill Publishing Co. 1983.

Textbook designed to create a threefold understanding of: (1) all facets of the environment that affect ecosystems and human life; (2) the impacts of human activities on various aspects of environmental quality; and (3) the environmental, economic, and cultural factors that shape urban development.

Humanizing Environmental Education: A Guide for Leading Nature and Human Nature Activities.

Clifford Knapp and Joel Goodman. Published by the American Camping Association in Martinsville, IN, 1981. Available from the American Camping Association, Martinsville, IN, 46151-7902.

## Introduction to Environmental Studies.

Jonathan Turk and W.B. Saunders. 1980.

This secondary-college text is divided into the following study units:

- I. Introduction and Social Background
- II. The Biological Background
- III. Human Population
- IV. Resources and Energy
- V. Rural Land Use
- VI. Pollution

This book was written to provide environmental education to a wide variety of people. It gives an overview of various social, economic, technical, and political issues. The problems of ecological disruptions, growth of human population, land use, energy, nuclear power, food supplies, pesticides, air and water pollution, solid waste, and noise are covered. Specific features of this text include: case histories, take-home experiments, problems and questions for class discussions, chapter summaries, glossary, and use of the metric system.

## Investigating Your Environment. June, 1980.

U.S. Forest Service-U.S. Dept. of Agriculture, U.S. Government Printing Office.

A set of separate activities for secondary teachers designed for investigating different components of the environment. Techniques such as collecting observable data, making inferences, setting up investigations to check inferences, communicating feelings and awareness are used in these activities. Many of the investigations are wholly or partially conducted outside and all stress active participation by the learner. Some of the activities cover such topics as water, wildlife, soils, forestry, land use, and human communities.



#### Manatecs.

For information, write: Florida Department of Natural Resources, 3900 Commonwealth Blvd., Tallahassee, FL 32302.

The excellent educator's guide to the natural history, habitat, problems and conservation of the Order Sirenia (manatees) contains thorough information, excellent illustrations and innovative activities for use with students. Also included is a color poster, "Sirenians of the World," a reference sheet for further information and a manatee fact sheet. A 23 minute videotape program, "Silent Sirens: Manatees in Peril," is available.

Nature Scope.

National Wildlife Federation. Periodical. Produced 4-6 times a year by the National Wildlife Federation, 1412 Sixteenth Street, Washington D.C. 20036.

Nature Scope targets a new area of the environment each issue: wetlands, mammals, birds, descrts, weather, insects, etc. Each 64 page booklet is packed with teacher background, interdisciplinary activity ideas, resources, handout masters, and ideas to extend the theme. Back issues are available.

### Nature With Children of All Ages

Edith Sisson. Published by Englewood Cliffs of NJ in 1982. Available through bookstores.

Earthworm races, seed planting, aging a tree, winter temperature, migration reporting, and water testing are some of the many activity ideas that fill this 200 page guide to nature study. It includes good ideas for early elementary explorations.

## OBIS. Outdoor Biology Instructional Strategies.

Available at the Schlitz Audubon Center Shop, 1111 E. Brown Decr Road, Milwaukee, WI 53217.

QBIS is an outdoor program in module form that offers young people fun and challenging opportunities to investigate ecological relationships in their local environments. It consists of a series of one hundred activities that can be used together or individually. One may use them as the core for an outdoor education program or to provide some challenging biology activities that also stress language, math and problem-solving skills.

### The Ocean: Consider the Connections...

Written, published and available from the Center for Environmental Education, 6624 9th Street, Washington D.C. 20001, 1985.

Information and activities on our global waterways: waves, tides, animals, adaptations, ecosystems, and people are covered.

#### Our Great Lakes Connection: A Curriculum Guide for Grades Kindergarten Through Eight.

Lynn Entine. Wisconsin Sea Grant Program of the University of Wisconsin-Madison, Environmental Resource Center, 1450 Linden, Madison, WI 53706. 1985.

#### Preparing for Tomorrow's World.

Louis Iozzi. Written from Rutgers University, Newark, NJ and available from Sopris West Inc., 1120 Delaware Ave., Longmont, CO 80501. 1982.

Twelve curriculum modules include a Teacher's Guide and Student Guide in this interdisciplinary program for grades 7-12. Issues such as energy, communications, technology, bioethics, and transportation are presented with background readings and dilemmas--situations with no good resolution, to help students practice seeing multiple viewpoints, communicating their ideas, and making decisions on tough ethical issues.



Project Creation. Concern Regarding the Environment and Technology in our Nation/Neighborhood.

Title IV, ESEA, Developed at La Salle-Peru Township High School, District #120, La Salle, IL. 1978. Available through: The Environment and Technology Project, 1633 N. Burling, Chicago, IL 60614. Telephone: (312) 280-8163.

A series of sixteen environmental and technology units that cover the major concepts of energy, land use, urban management, and pollution. "The overall goal of CREATION is the development of students as citizens who will hold a strong environmental ethic." Five universal objectives appear in this curriculum as follows: interdependence, impact, maintenance, quality of life, and improvement.

#### Teaching Environmental Education.

Harold Hungerford and R. Ben Payton. 1976. Published by J. Weston Walch, Portland, ME 04104.

A source of information for middle and secondary school teachers who are responsible for curriculum development and/or instruction in this field. Provides components of environmental literacy, an introduction to ecological foundations, analysis of an environmental issue, suggestion for environmental action training, and a summary of selected environmental education programs for possible use. Suggested activities are provided to guide the teacher in developing and implementing environmental education strategies.

Thinking Globally and Acting Locally: Environmental Education Teaching Activities.

Lori Mann and William B. Stapp. Published by and available from ERIC/SMEAC, Ohio State University, 1200 Chambers Road, Third Floor, Columbus, OH 43212. 1982.

Environmental issues are larger than any one municipal boundary and are tightly intertwined with issues of culture, economics, politics, history, and science. This manual provides activities for upper elementary through high school students that help distill the global consequences of local issues and actions.

Understanding the Game of the Environment: An Illustrated Guide to Understanding Ecological Principles.

David R. Houston. Published by and available from the US Forest Service, US Dept. of Agriculture, Washington D.C. as the Agricultural Information Bulletin No. 426. 1979.

Here is one of the few ecological texts published for high school students. Major ecological principles are summarized and organized into a game, complete with players, rules, boundaries, etc. Detailed illustrations provide the basis for in-depth discussions.

## The Wholeschool Book: Teaching and Learning in the 20th Century.

Bob Samples, Cheryl Charles, and Dick Barnhart. Published by Addison-Wesley Publishing Company, Reading, MA. 1977. Available at bookstores.

This book offers a humanistic, people-oriented philosophy of education complete with suggestions for questions, discussions, and activities that encourage students to participate in the learning process.

#### Wildlife Habitat Conservation Teacher's PAC Series.

Environmental education teaching aids available from the National Institute for Urban Wildlife. Write: National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, MD 21044.

The PAC's were originally developed by the U.S. Fish and Wildlife Service and targeted at the fourth through seventh grade level student. The contents of each teacher's PAC component are: poster (1), teaching overview (1), lesson plans (3), student centered pages (2-6), and a folder. The following PAC's are available: Urban Areas; Freshwater Marshes: Beaches, Dunes and Barrier Islands; Wetland Conservation and Uses; Endangered Species; Migrating Birds; Hunting and Wildlife Conflicts; and Wildlife Conflicts.



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