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ABSTRACT

Presented in these teacher's guides for grades two through four are lesson plans and ideas for integrating mathematics and environmental education. Each lesson originates with a fundamental concept pertaining to the environment and states, in addition, its discipline area, subject area, and problem orientation. Following this, behavioral objectives and suggested learning experiences are outlined. Behavioral objectives include cognitive and affective objectives and skills to be learned, while learning experiences list student-centered in-class activities and outside resource and community activities. Space is provided for teachers to note resource and reference materials--publications, audio-visual aids, and community resources. The guides are supplementary in nature and the lessons or episodes are designed to be placed in existing course content at appropriate times. This work was prepared under an ESEA Title III contract for Project I-C-E (Instruction-Curriculum-Environment). (BL)

Project I - C - E INSTRUCTION - CURRICULUM - ENVIRONMENT

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 2

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
1927 Main Street
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(after Dec. 1, 1972 - 468-7464)

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Robert Kellner, Asst
George Howlett, EE S

E INSTRUCTION - CURRICULUM - ENVIRONMENT

PROGRAM FOR ENVIRONMENTAL EDUCATION

Mathematics GRADE 2

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Robert Warpinski, Director
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PREFACE

"Oikus" for house is the Greek origin of the term "ecology". studies our house--whatever or wherever it may be. Like an un expand or contract to fit many ranges--natural and man-made. environments--our many "houses" if we omit rancor and cite lon complexities. Our "oikus" uses the insights of all subjects. multidisciplinary program like ours necessarily results. Also a long time, our program ranges K thru 12. The environment mi values. These values have their origin in the "oikus" of our minds. Let us become masters of our house by replacing the G with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your stud to adapt or adopt. Limitless chances are here for your exp Many episodes are self contained, some open-minded, still o developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no and no curriculum will work unless viewed in the context of
4. React to this guide with scratch ideas and notes on the epi
5. After using an episode, fill out the attached evaluation fo duplicate, or request more of these forms. Send them singl We sincerely want your reactions or suggestions--negative a evaluations are the key in telling us "what works" and in a the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all school districts in CESA 3, 8, and 9. Check the Project ICE B resources. Our address and phone number is on this guide's co or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or proce

Affective refers to student attitudes, values, and feelings.

PREFACE

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"houses" if we omit rancor and cite long range gains, costs, and
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your reactions or suggestions--negative and positive. Your
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NS

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udio Visual Instruction, 1327 University Avenue, P. O. Box 2093,
701 (Phone: 608-262-1644).
easurable mental skill, ability, or process based on factual data.
student attitudes, values, and feelings.

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CONCEPT 1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.

Discipline Area Mathemati

Subject Measureme

Problem Orientation Sun En

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPER	
Cognitive: Each student will make graphs to show the difference of growth in 5 different plants. Affective: The student will support the need of adequate sunlight for all plant life. Skills to Be Learned Observation Discussion Making Graphs Comparison	I. Student-Centered in class activity A. Plant Growth Comparison Graph 1. Plant 4 seeds in same size pots and soil. a. First pot place in sunlight b. Second in shady place c. Third in dark place. d. Plant a small bean seed in one pot e. Plant a larger bean seed in - other. 2. Watch growth of all pots As soon as a plant appears, record date, height, or girth, or number of leaves. Continue for 2 weeks recording each day. 3. Make a graph for each plant showing the growth over number of days 4. Compare the graphs of all the plants. Discuss the difference of each plant and why. *Use one of these ideas or divide class into groups.	II. Out Com A. Ta school tation Compar the be

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Discipline Area Mathematics

Subject Measurement - Graphs

Problem Orientation Sun Energy Grade 2

ES	SUGGESTED LEARNING EXPERIENCES	
	I. Student-Centered in class activity A. Plant Growth Comparison Graph 1. Plant 4 seeds in same size pots and soil. a. First pot place in sunlight b. Second in shady place c. Third in dark place. d. Plant a small bean seed in one pot e. Plant a larger bean seed in another. 2. Watch growth of all pots As soon as a plant appears, record date, height, or girth, or number of leaves. Continue for 2 weeks recording each day. 3. Make a graph for each plant showing the growth over number of days 4. Compare the graphs of all the plants. Discuss the difference of each plant and why. *Use one of these ideas or divide class into groups.	II. Outside Resource ar Community Activities A. Take a field trip around school ground to look at vegetation on each side of building. Compare the sides as to where the best growth occurs.

Resource and Reference Materials	Continued and Additional Suggested Learning Experi
Publications:	
Audio-Visual: movie - Plants and Their Importance (color) 11 min. BAVI	
Community: County Agricultural Agent	

ng	rials	Continued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject	Problem Orientation
2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.	Mathematics	Sets	Ecosystem

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
Cognitive: The child will observe 3 animals for 5 minutes each, listing all the objects the animal comes in contact with during that time. Affective: The child will have awareness of how different systems interact Skills to be Learned 1. Observation 2. Listing 3. Counting 4. Discussion	I. Student-Centered in class activity A. have each child observe 3 animals, for 5 minutes each. Number and list all the things the animal touches during the given time. Child draws a picture of each animal and the items it interacts with. Write the number of all the objects in that set B. Using the pictures from part A. what would happen if one or more of the objects was removed from the set. Ex: Bird-set of tree, ground warm air. Number 5 objects in set , take away the worm 4 objects left. What would happen if worm taken away? C. Observe other sets besides animals, such as schools, homes, etc.	II. Outsi Commu A. Visi unit to acts.

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unit

Discipline Area Mathematics

Subject Sets

Problem Orientation Ecosystems Grade 2

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Have each child observe 3 animals, for 5 minutes each. Number and list all the things the animal touches during the given time. Child draws a picture of each animal and the items it interacts with. Write the number of all the objects in that set

B. Using the pictures from part A. what would happen if one or more of the objects was removed from the set.

Ex: Bird-set of tree, ground warm air. Number 5 objects in set , take away the worm 4 objects left. What would happen if worm taken away?

C. Observe other sets besides animals, such as schools, homes, etc.

II. Outside Resource and Community Activities

A. Visit the local government unit to see how each part interacts.

Resource and Reference Materials	Continued and Additional Suggested
Publications: Community Planning Handbook Ginn & Co. I-C-E # 100 G RMC Audio-Visual: film Community (color) 11 min. $4.00 BAVI no 5245 Sea (color) 28 min. $9.00 BAVI no. 5286 Community: Farm	

ted	terials	Continued and Additional Suggested Learning Experience
	ook	
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ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject -	Problem Orientation
3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.	Mathe	Measu	Car

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	II.
Cognitive: The children will, through experimenting find out which container holds the most popcorn. Affective: The child will be able to choose which area can hold the larger amount. Skills to be Learned Listening Experimenting Discussion Comparing	I. Student-Centered in class activity A. Tell the children Pete's Popcorn Problem 1. Supplies for class a. Two containers of different volumes with deceptive shapes so that children cannot tell at a glance which is larger. b. Popcorn or some similar material in 1 large container. c. For each group of 3 or 4 children 1 tray with 2 small containers of different volumes and shapes. Children can bring this from home. 1 plastic container (12 oz) 2. After story ask these questions: What did Pete want to find out? (which container would hold the most popcorn). How could he find out? Ask the children for suggestions. (Continued on reverse side)	A c m b

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ntal factors are limiting
rs of organisms living
influence, thus, each
has a carrying capacity.

Discipline Area Mathematics

Subject - Measurement

Problem Orientation Carrying Capacity Grade 2

G E	BJECTIVES	SUGGESTED LEARNING EXPERIENCES	
II.	children xperimenting ontainer opcorn.	I. Student-Centered in class activity A. Tell the children Pete's Popcorn Problem 1. Supplies for class a. Two containers of different volumes with deceptive shapes so that children cannot tell at a glance which is larger. b. Popcorn or some similar material in 1 large container. c. For each group of 3 or 4 children 1 tray with 2 small containers of different volumes and shapes. Children can bring this from home. 1 plastic container (12 oz) 2. After story ask these questions: What did Pete want to find out? (which container would hold the most popcorn). How could he find out? Ask the children for suggestions. (Continued on reverse side)	II. Outside Resource and Community Activities A. Take a quart of sand, gravel, clay, and rich soil. (You may use any other kinds available) 1. Put water into the containers until the soil will absorb no more. 2. Compare the measurements to see the different capacities of soil to hold water.
A.	child choose old the		
	rned		

Resource and Reference Materials	Continued and Additional Sugge
Publications: Introducing Measurement Minnemast-Minnesota Mathematics and Science Teaching Project Corona, Philip, Things that Measure New York, Prentice Hall 1962 I-C-E 110 UN 5 RMC Audio-Visual: Community: County agent on kinds of soil	I. (cont) 3. Divide class into small two small unfilled contain container filled with popc a. Ask the children to f they would use if they w popcorn. b. Watch children to see Pete's Popcorn Pete liked popcorn very much! buttered . He liked popcorn bal ate popcorn while he watched T he went to bed. He liked going could buy an especially big bo would even eat popcorn for bre would let him. One day Pete's father told hin for him. "What is it, Daddy? What is it "You will find out on Saturday surprise very much!" Pete woke up early on Saturday "Today's Saturday, Dad. Tell n please," Pete asked. "We will drive to the surprise Soon they came to a big, big b didn't know many of the words one! POPCORN! "A friend of mine owns this po "I told him how much you like workers here getting all kinds to buy." Pete and his father met the ma (continued on next page)

Materials	Continued and Additional Suggested Learning Experiences
	I. (cont) 3. Divide class into small groups and give each group two small unfilled containers and the large plastic container filled with popcorn. a. Ask the children to find out which container they would use if they were going to take home some popcorn. b. Watch children to see how they decide. Pete's Popcorn Problem Pete liked popcorn very much! He ate popcorn plain and buttered . He liked popcorn balls and caramel popcorn. He ate popcorn while he watched TV and as a snack just before he went to bed. He liked going to the movies because he could buy an especially big box of popcorn there! Pete would even eat popcorn for breakfast -- if only his mother would let him. One day Pete's father told him he had a special surprise for him. "What is it, Daddy? What is it? Pete asked. "You will find out on Saturday. I know you will like this surprise very much!" Pete woke up early on Saturday. So did Daddy. "Today's Saturday, Dad. Tell me what my surprise is -- please," Pete asked. "We will drive to the surprise. Come On! Let's get started" Soon they came to a big, big building, Pete saw a sign . He didn't know many of the words on the sign but he did know one! POPCORN! "A friend of mine owns this popcorn factory," Daddy said, "I told him how much you like popcorn. He said we could see workers here getting all kinds of popcorn ready for people to buy." Pete and his father met the man who owned the factory and (continued on next page)

he showed them the popping machines. Then Pete saw how the
the popcorn and how they made popcorn balls.

When they had seen all these things the man said, "Would y
to take some popcorn home?"

"Oh yes!" Pete answered.

"You must decide one thing. Here are some different contai
(Point out the two containers you have set out.) "You may f
of them with popcorn."

Pete looked at the containers. They were different shapes.
to be sure he took as much popcorn as he could. He knew he

Pete's Popcorn Problem (continued)

e popping machines. Then Pete saw how they packaged
ow they made popcorn balls.

h all these things the man said, "Would you like
orn home?"

swered.

one thing. Here are some different containers."
o containers you have set out.) "You may fill one
orn."

containers. They were different shapes. He wanted
as much popcorn as he could. He knew he had a problem!

CONCEPT: 4. An adequate supply of pure water is essential for life.

Discipline Area: Mathema

Subject: Measure

Problem Orientation: Water

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	
Cognirive: The student will measure the speed, depth, width, and temperature of a small stream. Affective: A student will question the differences between a clean and polluted stream. Skills to be Learned 1. Comparing 2. Measuring	I. Student-Centered in class activity A. If a small stream is near Rural Studies - Stream 1.a. Find the spot there the stream is the widest. b. Find the spot where the stream is the narrowest. c. How are the spots the same? d. How are the spots different? 2.a. Find the deepest spot. b. find the shallow spots c. Where is deep water found? 3. Find speed of river (float a block of wood and time its flow) 4. Find temperature of water. B. More ideas on water in the ecolab. C. Compare a few of the stream properties with a river. D. Compare a clean stream with a polluted one of about the same size. (Continued on reverse side)	II. A. B.

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Discipline Area Mathematics

Subject Measurement - length

Problem Orientation Water Quality Grade 2

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SUGGESTED LEARNING EXPERIENCES

. Student-Centered in class activity

A. If a small stream is near Rural Studies - Stream

1.a. Find the spot there the stream is the widest.
b. Find the spot where the stream is the narrowest.
c. How are the spots the same?
d. How are the spots different?

2.a. Find the deepest spot.
b. find the shallow spots
c. Where is deep water found?

3. Find speed of river (float a block of wood and time its flow)

4. Find temperature of water.

B. More ideas on water in the ecolab.

C. Compare a few of the stream properties with a river.

D. Compare a clean stream with a polluted one of about the same size.

(Continued on reverse side)

II. Outside Resource and Community Activities

A. While at the stream sketch and count kinds of plants found in it.

B. Have a trout fisherman tell the effect of pollution on his trout fishing creek.

Resource and Refernece Materials	Continued and Additional Suggest
Publications: Kit # 21 at I-C-E RMC Ecolab- a study of the rural and urban environment Johnson and Mann Running Waters I-C-E 120 MA 5 Fresh water and Man I-C-E 130 Mc6 Audio-Visual: Life Along the Waterways (color) 11 min. BAVI $ 3.50 Water (9 min.) $2.00 BAVI Community: DNR representative - someone who trout fishes	I. (Continued) E. Use the film The Stream fr 1. Compare the stream the s measured with the stream in 2. Which could support life

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n in
life

Continued and Additional Suggested Learning Experiences

I. (Continued)

E. Use the film The Stream from I-C-E RMC
1. Compare the stream the students visited and measured with the stream in the film.
2. Which could support life more easily?

CONCEPT	Discipline Area	Subject	Problem Orientation
5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.	Mathema	Order o	Air q

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	
Cognitive: The student will collect different samples of air pollution and place the samples in order of smallest to greatest. Affective: The student ~~will propose~~ different ways to cut down on air pollution. Skills to be Learned Collecting Comparing Discussion	I. Student-Centered in class activity A. Air filter activity 1. Make a device to collect air pollution samples. Get a vacuum cleaner and some filter paper a little bigger than the end of the hose. Fold it down and put a rubber band over the filter to hold it down. 2. Collect pollutants in different places. (New filter for each) a. Inside house b. Outside house c. In school d. In industrial area e. In one place at different times of day. f. Exhaust from car. (stand at side of auto so you don't breathe CO g. Use different cars, trucks, motorcycles etc. 3. Compare all filter and place in order from very (continued on reverse side)	II. A. ve en B. ai pl th

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air Discipline Area Mathematics

isms Subject Order of Numbers

ra- Problem Orientation Air quality control Grade 2

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SUGGESTED LEARNING EXPERIENCES

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Air filter activity
. Make a device to collect air pollution
amples. Get a vacuum
leaner and some filter
aper a little bigger
han the end of the hose.
old it down and put a
ubber band over the filter
o hold it down.
. Collect pollutants in
ifferent places. (New
ilter for each)
a. Inside house
b. Outside house
c. In school
d. In industrial area
e. In one place at different times of day.
f. Exhaust from car.
(stand at side of auto
o you don't breathe CO
g. Use different cars,
rucks, motorcycles etc.
Compare all filter and
ace in order from very
ontinued on reverse side)

II. Outside Resource and Community Activities

A. Cars, trucks, and other motor vehicles of the children's parents.
B. Industrial area - collect air samples from different places within the area and run the test as before.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Air Pollution Lavaroni and O'Donnel Addison-Wesley Pub. Co. at I-C-E Clean Air for Your Community Environmental Health Services I-C-E Vertical File Shuttlesworth, D.E. Clean Air, Sparkling Water the fight against Pollution, Doubleday 1968 $ 3.95 Audio-Visual: Filmstrips I-C-E Ward's Natural Science Establishment Environmental Pollution Our World in Crisis at I-C-E FS Stl Community: Auto mechanic to talk on how to cut down air pollution from cars.	I. Continued 3. light to very dark. Number i 4. Discuss filters. Teacher ask Which is the worse pollutor How can air pollution be cu

este tinued and Additional Suggested Learning Experiences

ontinued

er i . light to very dark. Number from 1 to 7.
ask . Discuss filters. Teacher ask question such as:
tor Which is the worse pollutor one or two? Why?
cu How can air pollution be cut down in some areas?

CONCEPT	Discipline Area	Subject	Problem Orientation
6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.	Math	Coun	C

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING	II
Cognitive: The student will count the number of seeds that develop on a dandelion flower. Affective: The student will recommend ways to prevent the rapid growth of dandelions. Skills to be Learned Counting Comparing	I. Student-Centered in class activity A. Dandelion Seed Count 1. Collect a number of dandelions that have gone to seed. Collect several by putting a small bag over the flower and grasping the bag around the flower stem. Count the seed of at least 10 flowers. Teacher find the average number of seeds on a flower. Estimate the number of seed in the lawn area. *2. Germination test of dandelions. Count some seeds and plant them in pots. It will take several weeks for them to germinate. How many of them germinate? 3. Make a list of why some seeds do not grow. (birds, paved areas etc.) 4. Find out where dandelions grow. * list numbers planted compared to numbers that grew.	

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Discipline Area Mathematics

Subject Counting

Problem Orientation Green Areas Grade 2

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Dandelion Seed Count

1. Collect a number of dandelions that have gone to seed. Collect several by putting a small bag over the flower and grasping the bag around the flower stem. Count the seed of at least 10 flowers. Teacher find the average number of seeds on a flower. Estimate the number of seed in the lawn area.

*2. Germination test of dandelions. Count some seeds and plant them in pots. It will take several weeks for them to germinate. How many of them germinate?

3. Make a list of why some seeds do not grow. (birds, paved areas etc.)

4. Find out where dandelions grow.

* list numbers planted compared to numbers that grew.

II. Outside Resource and Community Activities

A. Lawn or grassy area.

B. Compare the dandelions in lawn with those in a weedlot.

Resource and Reference Materials	Continued and Additional Sugg
Publications: Kit: Investigations in Ecology Schultz and Marcuccio. Project I-C-E RMC Audio-Visual: Film Nature's Half Acre (33 min) color Project I-C-E RMC Film 210 Community: Gardener - speak on how he fights a dandelion problem.	

Sugg nued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject	Problem Orientation
7. Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.	Mathem	Area a	Land

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPE	
Cognitive: The student will count the number of people in area and compare the number of people to the number of houses. Affective: The children will attempt to find new and better use of land space Skills to be Learned Census - Counting Research	I. Student-Centered in class activity A. Take a given area in classroom and mark off. In this area place a box shaped for a small house. Tell children that only two people live in the house and there is only that much room. Each day the teacher add a new item that will require more area on the given lot. (car-garage) (more money bigger house) (children - more rooms) (recreation room) children should see that the same area supports more buildings and people. B. Each child should ask parents how big a lot they live on. C. Take a census on each home finding these things: 1. number of rooms 2. number of people. 3. size of garage (1 or 2 car.) D. Have children count the number of houses and people in their block or area.	II. C C A. to num men

ing Discipline Area Mathematics

ditions, Subject Area and Counting

ased Problem Orientation Land Use Grade 2

fluence on

ers of population density.

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Take a given area in classroom and mark off. In this area place a box shaped for a small house. Tell children that only two people live in the house and there is only that much room. Each day the teacher add a new item that will require more area on the given lot. (car-garage) (more money bigger house) (children - more rooms) (recreation room) children should see that the same area supports more buildings and people.

B. Each child should ask parents how big a lot they live on.

C. Take a census on each home finding these things:
1. number of rooms
2. number of people.
3. size of garage (1 or 2 car.)

D. Have children count the number of houses and people in their block or area.

II. Outside Resource and Community Activities

A. Visit an apartment building to see how space is used and number of people in the apartment.

Resource and Reference Materials	Continued and Additional Su al
Publications: Ecology; The City at I-C-E RMC 130 Mc 10 Community Planning at I-C-E 110 GI Ecolab at I-C-E Kit 21 Audio-Visual: Cities are Different and Alike BAVI The City BAVI Community: Real Estate Agency	

I Su als	Continued and Additional Suggested Learning Experiences
ic	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipl	Subject	Problem
8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.			

BEHAVIORAL OBJECTIVES	SUGGI
Cognitive: The learner will add and subtract as he plays the ecology game. Affective: The learner will suggest ways of achieving a clean world Skills to be Learned 1. Number line 2. Forward movement 3. Backward movement	I. Student-Centered activity A. Use a number lin 10. 1. Make sure the are familiar wit line. 2. Use the chart the idea of move ber line. 3. You can impro chart according 4. A forward dir could be a resul itive ecological Reverse directio be a result of n ecological actio B. Use the game on page. 1. Make a game b every 4 students 2. You will need place markers fo 3. You will need and negative car points for ecolo tions. (continued on rev

ipli .c, social,
ect :s determine
lem ies and atti-
vironment.

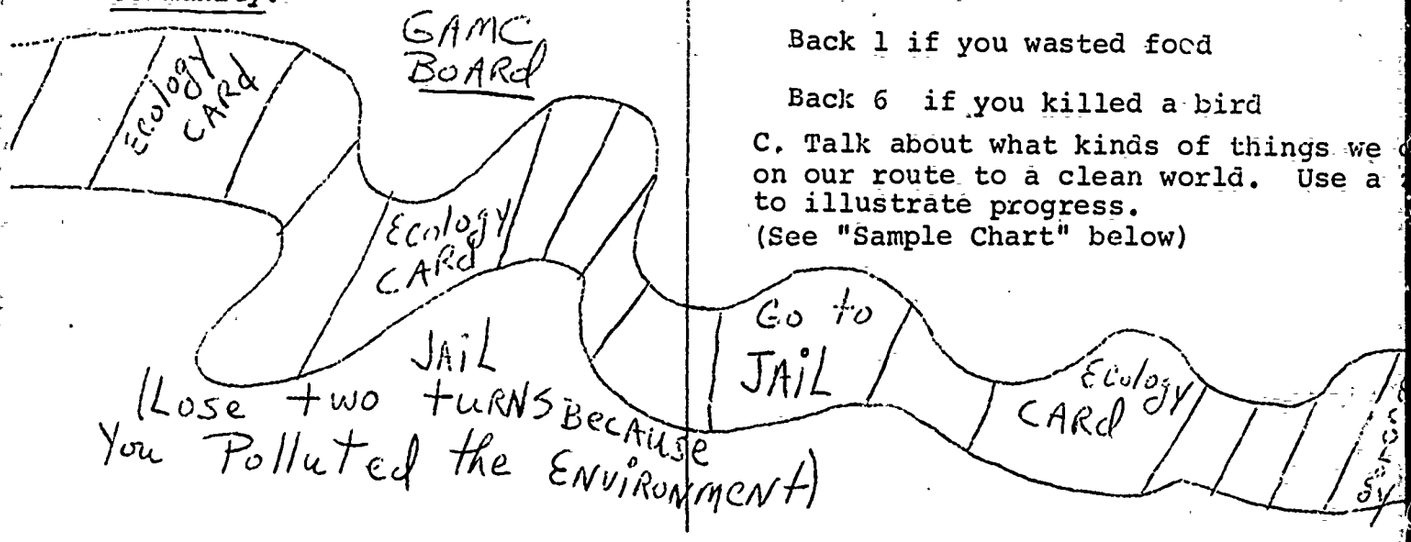
Discipline Area Mathematics

Subject Addition and Subtraction

Problem Orientation Quality of Life Grade 2

UGGI :VES	SUGGESTED LEARNING EXPERIENCES	
red lin ne. the wit hart move mpro ng dir esul cal tio f n tio on e b nts eed for ed p card olog rev	I. Student-Centered in class activity A. Use a number line from 1 - 10. 1. Make sure the students are familiar with a number line. 2. Use the chart to get the idea of movement number line. 3. You can improvise on the chart according to need. 4. A forward direction could be a result of positive ecological action. Reverse direction could be a result of negative ecological action. B. Use the game on the next page. 1. Make a game board for every 4 students. 2. You will need dice and place markers for each team. 3. You will need positive and negative cards with points for ecological actions. (continued on reverse side)	II. Outside Resource and Community Activities A. Ask a street cleaner to keep track of the amounts he cleans off the street for about a week in terms of increase or decrease of amounts. Use the information and apply to the numberline.

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Ecology the City 130 Mc10 I-C-E The Environmental School I-C-E 120 Me CB **Audio-Visual:** Our Land Needs your help BAVI Nature is for People BAVI Lakes BAVI **Community:**	I(continued) 4. Roll the dice and go the number o roll. Do what the square tells you. 5. The winner is the person who gets first. 6. Discuss how many people fluctuate and attitudes toward environment. Sample Cards: Forward 2 if you pick up paper in th Forward 4 if you walked to school Forward 1 if you turned off a light Back 3 if you burned garbage this we Back 2 if you have books on the floo Back 1 if you wasted food Back 6 if you killed a bird C. Talk about what kinds of things we on our route to a clean world. Use a to illustrate progress. (See "Sample Chart" below)



Continued and Additional Suggested Learning Experiences

I(continued)

4. Roll the dice and go the number of spaces you roll. Do what the square tells you.
5. The winner is the person who gets to Clean World first.
6. Discuss how many people fluctuate on their values and attitudes toward environment.

Sample Cards:

Forward 2 if you pick up paper in the room.

Forward 4 if you walked to school.

Forward 1 if you turned off a light

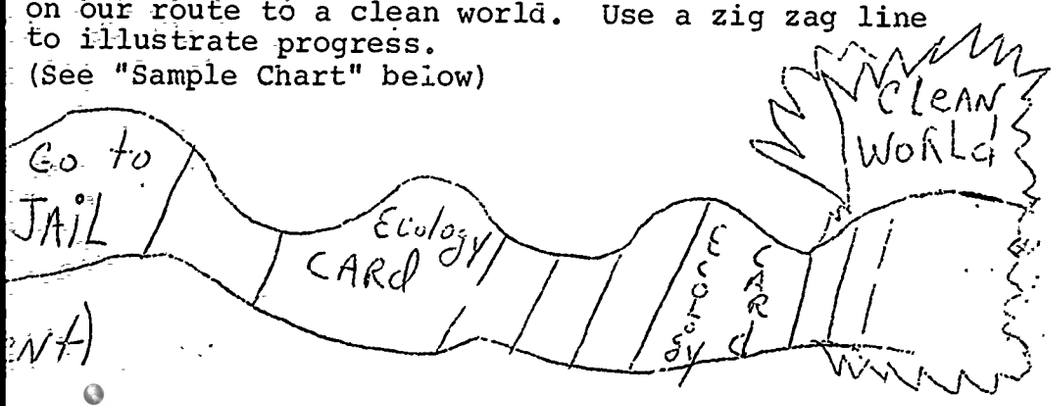
Back 3 if you burned garbage this week

Back 2 if you have books on the floor

Back 1 if you wasted food

Back 6 if you killed a bird

C. Talk about what kinds of things we do back and forth on our route to a clean world. Use a zig zag line to illustrate progress.
(See "Sample Chart" below)



ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipli
9. Man has the ability to manage, manipulate, and change his environment	Subject
	Problem C

BEHAVIORAL OBJECTIVES	SUGGESTE
Cognitive: The student will make a picture of a city's skyline using the basic geometric shapes. Affective: The student will investigate the shapes that make all buildings. Skills to be Learned Observation Making squares, triangles, circles, and rectangles Discussion	I. Student-Centered in Activity A. Discuss basic geom shapes- squares, tria Circles, and rectangl B. Field trip of city skyline. Note and rec basic shapes that mak buildings of a city. C. In school each stu make a picture of the using the basic geome shapes. D. Discuss one buildi it lends itself to t all view of the city.

ity to manage,

nge his

Discipline Area Mathematics

Subject Geometry - shapes

Problem Orientation Urban Environment Grade 2

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class Activity

A. Discuss basic geometric shapes- squares, triangles, Circles, and rectangles.
B. Field trip of city to see skyline. Note and record the basic shapes that make up the buildings of a city.
C. In school each student make a picture of the city using the basic geometric shapes.
D. Discuss one building as it lends itself to the over all view of the city.

II. Outside Resource and Community Activities

A. Field trip to see the sky-line of the city, or a nearby village.
B. Construct from boxes heights, sizes, and shapes of buildings.

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Ecology - The City I-C-E RMC 130 M40 Ecolab Kit 21 I-C-E RMC	
Audio-Visual: Pictures of Buildings "Cities are different and alike" BAVI "The City" BAVI	
Community: Carpenter	

d Lea tinued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject	Problem Orientation
10. Short-term economic gains may produce long-term environmental losses.	Mathema	Subtrac	Wa

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	
Cognitive: The child will, through actual measurement, determine the amount of water wasted by one dripping faucet in a given period and compare water wasted in different faucets. Affective: The child will attempt to correct leaking faucets in his home through pressuring parents. Skills to be Learned 1. Observation 2. Comparison 3. Subtraction	I. Student-Centered in class activity A. Dripping faucets send clean, usable water into the sewers. 1. If you have a leaky faucet at home or in school find out the volume of water wasted in 24 hours. 2. Find the total number of leaky faucets in school and in all the homes of the students and the teacher. Together find the total waste of water if each wasted the same volume. B. Problems to be worked 1. Mary's leaky faucets wasted 15 cups of water a day. John's leaky faucets wasted only 6 cups a day. How much less water was wasted in John's home? 2. After Tom fixed the leaky faucet, it only dripped 1 cup a day. Before it was fixed it dripped 11 cups a day. How much did he save? (continued on reverse side)	II. A. ex co an wa B. to th wa th

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Discipline Area Mathematics

Subject Subtraction

Problem Orientation Water Quality control Grade 2

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SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Dripping faucets send clean, usable water into the sewers.

1. If you have a leaky faucet at home or in school find out the volume of water wasted in 24 hours.

2. Find the total number of leaky faucets in school and in all the homes of the students and the teacher. Together find the total waste of water if each wasted the same volume.

B. Problems to be worked

1. Mary's leaky faucets wasted 15 cups of water a day. John's leaky faucets wasted only 6 cups a day. How much less water was wasted in John's home?

2. After Tom fixed the leaky faucet, it only dripped 1 cup a day. Before it was fixed it dripped 11 cups a day. How much did he save?

(continued on reverse side)

II. Outside Resource and Community Activities

A. Municipal water worker to explain the importance of conserving water supply and the effects of wasted water.

B. Fire department employee to talk to pupils about the importance of a sufficient water supply for fire needs of the community.

Resource and Reference Materials	Continued and Additional Suggested Le s
Publications: Kit Investigations in Ecology card number 10 , Leaky Faucets Project I-C-E RMC The Magic of Water Charles Scribner and Sons The First Book of Water Audio-Visual: How Water Helps Us IMC BAVI F 181-D Community: City Water Department City Fire Department The Homes	3. During one day Bob used water five he wasted 4 cups, the next two times the 4th time he wasted 6 cups, the la 8 cups. How many cups of water did he 4. If Mary uses 30 gallons of water i Barb uses 42 gallons in one day. Who How much more? 5. If John forgot to shut off the wat getting a drink. How much water would if 8 gallons of water came out of th

Continued and Additional Suggested Learning Experiences

3. During one day Bob used water five times. The 1st time he wasted 4 cups, the next two times he wasted 5 cups, the 4th time he wasted 6 cups, the last time he wasted 8 cups. How many cups of water did he waste?
4. If Mary uses 30 gallons of water in one day and Barb uses 42 gallons in one day. Who uses more water? How much more?
5. If John forgot to shut off the water tap after getting a drink. How much water would he waste in 3 hours if 8 gallons of water came out of the tap every hour?

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Mathematics
11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.	Subject	Computation
	Problem Orientation	Litte

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIEN	
Cognitive: The learner will add weights of litter. Affective: The learner will support a campaign for individual responsibility to cut litter accumulation. Skills to be Learned Computation Weighing Observing Keeping records	I. Student-Centered in class activity A. You will try to determine the number of returnable or recyclable containers used at home. 1. Discuss re-usable containers and containers that must be thrown out. 2. Count homes who use milk bottles, juice bottles, pop bottles, and plastic containers. 3. Have a campaign to return and make money with the returnable bottles. 4. Tally the returnable and non-returnable containers. B. Ask students to pick up cans and litter. 1. Add these 1 by 1 to determine effects. 2. Calculate total weight. C. Clean the desk and find the height of a pile of waste paper. 1. Individual piles 2. group pile. (continued on reverse side)	II. Outsi Commu A. take area to piling u B. Each at home and bott and disc and mont school. C. Locat area and litter. Keep rec for a pe

, duplicated

uce signifi-

alterations

Discipline Area Mathematics

Subject Computation

Problem Orientation Litter Grade 2

VES	SUGGESTED LEARNING EXPERIENCES	
	I. Student-Centered in class activity A. You will try to determine the number of returnable or recyclable containers used at home. 1. Discuss re-usable containers and containers that must be thrown out. 2. Count homes who use milk bottles, juice bottles, pop bottles, and plastic containers. 3. Have a campaign to return and make money with the returnable bottles. 4. Tally the returnable and non-returnable containers. B. Ask students to pick up cans and litter. 1. Add these 1 by 1 to determine effects. 2. Calculate total weight. C. Clean the desk and find the height of a pile of waste paper. 1. Individual piles 2. group pile. (continued on reverse side)	II. Outside Resource and Community Activities A. take a field trip to a dump area to see how much garbage is piling up. B. Each child should observe at home how much paper, cans, and bottles the family uses and discards in a day, week, and month. Bring figures to school. C. Locate a vacant lot or some area and note the amount of litter. Clean up and weigh. Keep record of litter amounts for a period of time.

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Kit Looking into Life Systems and Man's Impact on Environment Card 13 Project I-C-E RMC Audio-Visual: Garbage at I-C-E 260 RMC 1370 Wealth of the Wasteland color 30 min. $2.00 BAVI 6366 What's Happening to our Landscape 20 min. BAVI Paper and I, 14 min. Southern Pulpwood Conservation Film Service Labs Jefferson Road Athens, Ga. 30601 Film: Litter -ly Speaking 14 min. New York State Dept. of Transportation 1220 Washington Avenue Albany, New York 12226 Film: The Litterbug color - 8 min. Walt Disney Productions Educational Film Div. 500 S. Buena Vista Avenue Burbank, Ca. 91503 Community: Vacant Lot Dump	D. Discuss what happens when 1 person pared to 100 person. 1. Plan a campaign to make people mor responsibility to the environment.

Lea	ils	Continued and Additional Suggested Learning Experiences
son		D. Discuss what happens when 1 person litters as compared to 100 person.
mor	nt	1. Plan a campaign to make people more conscious of their responsibility to the environment.

n

ESEA Title III 59-70-0135-2 Project I-C-E

CONCEPT 12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.

Discipline Area Mathematics

Subject- Subtraction

Problem Orientation Forests

BEHAVIORAL OBJECITVES	SUGGESTED LEARNING EXPERI	
Cognitive: The learner will compute the effects of his behavior on a forest. Affective: The learner will offer suggestions as to how a forest can be cared for so that animal life is preserved Skills to be Learned 1. Even and odd numbers 2. Counting by 5 3. Subtracting 2 digit numbers. 4. One to one Correspondence 5. Interpretation	I. Student-Centered in class activity A. You will simulate a forest. 1. Each student will need 99 toothpicks for trees and 99 dots for birds and clay or styrofoam for ground. Put birds into the trees and the trees into the ground. 2. You sell 31 trees - how many trees are left? 3. What happens to the birds? 4. You plant 10 seedlings (broken toothpicks) Can birds live in seedlings? 5. The next year you sell 50 trees. How many big trees are left standing? 6. What happens to the birds? 7. You don't plant any more trees, but sell the rest of the big ones left. 8. What happens to the birds? 9. Discuss what resulted with your decision not to replant trees, but to continue selling (Continued on reverse side)	II. Outs Comm A. DNR of for of ani B. Men Societ vironm life. C. Iden birds a tree

nership must be re-
ewardship and should
pon or violate the
ht of others.

Discipline Area Mathematics

Subject- Subtraction

Problem Orientation Forests Grade 2

BJECITVES	SUGGESTED LEARNING EXPERIENCES	
earner will ts of his est. earner tions as an be animal ned umbers digit respondence	I. Student-Centered in class activity A. You will simulate a forest. 1. Each student will need 99 toothpicks for trees and 99 dots for b. rds and clay or styrofoam for ground. Put birds into the trees and the trees into the ground. 2. You sell 31 trees - how many trees are left? 3. What happens to the birds? 4. You plant 10 seedlings (broken toothpicks) Can birds live in seedlings? 5. The next year you sell 50 trees. How many big trees are left standing? 6. What happens to the birds? 7. You don't plant any more trees, but sell the rest of the big ones left. 8. What happens to the birds? 9. Discuss what resulted with your decision not to replant trees, but to continue selling (Continued on reverse side)	II. Outside Resource and Community Activities A. DNR to speak on the effect of forest use and destruction of animals. B. Member of the Audobon Society to speak on the environment conducive to bird life. C. Identify and count the birds that interact with a tree in the school yard.

Resource and Reference Materials	Continued and Additional Suggested I
Publications: Birds - Holt, Winston-Rinehart at I-C-E RMC Ecology - The Forest at I-C-E RMC Benziger 130 Mc Multiple - Use - Management at I-C-E 170 No. Audio-Visual: "Nature's Half Acre" Film 210 at I-C-E RMC "Our Natural Resources" BAVI Community: DNR Audobon Speaker	I. (continued) B. Using the forest again 1. Make a sheet with numbers from 1 2. Put this over the clay base and d est again. 3. Count by 5. Sell each tree that i Example: Tree number 5,10,15 etc. Ho 4. What should you do with the birds 5. Now sell off all odd numbered tre 6. What happens to the birds? 7. The remainder of the trees are in your campfire you left burning. 8. What happened to the birds? 9. Discuss the effects of your care What did you do to the birds.

Continued and Additional Suggested Learning Experiences

(continued)

B. Using the forest again

1. Make a sheet with numbers from 1 to 100
2. Put this over the clay base and discuss your new forest again.
3. Count by 5. Sell each tree that is on the number. Example: Tree number 5,10,15 etc. How many are left?
4. What should you do with the birds?
5. Now sell off all odd numbered trees. How many are left?
6. What happens to the birds?
7. The remainder of the trees are in a fire caused by your campfire you left burning.
8. What happened to the birds?
9. Discuss the effects of your care of the forest. What did you do to the birds.

PROJECT I-C-E Episode Evaluation Form (Reproduce or

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode used
form. Feel free to adapt it and add
your critiques and comments - negati
hand column, please rate (poor, good
make specific comments or suggestions
vided to help us make this a more us

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

or

:T I-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

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us

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

I. Behavioral Objectives
A. Cognitive:

B. Affective:

I. Skills Developed

I. Suggested Learning Experiences
A. In Class:

B. Outside & Community Activities:

V. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, WI 54301

Project I - C - E INSTRUCTION - CURRICULUM - EN

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 3

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
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(after Dec. 1, 1972 - 468-7464)

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Robert
George

INSTRUCTION - CURRICULUM - ENVIRONMENT

M FOR ENVIRONMENTAL EDUCATION

matics GRADE 3

II E.S.E.A.

A's 3-8-9

54301

468-7464)

Robert Warpinski, Director
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PREFACE

"Oikus" for house is the Greek origin of the term "ecology". En studies our house--whatever or wherever it may be. Like an umbrel expand or contract to fit many ranges--natural and man-made. We c environments, our many "houses" if we omit rancor and cite long ra complexities. Our "oikus" uses the insights of all subjects. Thu multidisciplinary program like ours necessarily results. Also, si a long time, our program ranges K thru 12. The environment mirror values. These values have their origin in the "oikus" of our coll minds. Let us become masters of our house by replacing the Greek with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is sup to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your students to adapt or adopt. Limitless chances are here for your experim Many episodes are self contained, some open-minded, still other developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no guid and no curriculum will work unless viewed in the context of you
4. React to this guide with scratch ideas and notes on the episode
5. After using an episode, fill out the attached evaluation form i duplicate, or request more of these forms. Send them singly or We sincerely want your reactions or suggestions--negative and p evaluations are the key in telling us "what works" and in aidin the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all pub school districts in CESA 3, 8, and 9. Check the Project ICE Bibli resources. Our address and phone number is on this guide's cover. or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Aven Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or process b

Affective refers to student attitudes, values, and feelings.

PREFACE

e is the Greek origin of the term "ecology". Environmental education -whatever or wherever it may be. Like an umbrella, our house can to fit many ranges--natural and man-made. We can add quality to our nany "houses" if we omit rancor and cite long range gains, costs, and "oikus" uses the insights of all subjects. Thus, a rational, positive, program like ours necessarily results. Also, since attitudes grow over rogram ranges K thru 12. The environment mirrors our attitudes or ues have their origin in the "oikus" of our collective and individual ome masters of our house by replacing the Greek adage of "Know thyself" and thine house."

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ATIONS

ct ICE Resource Materials Center serving all public and non-public n CESA 3, 8, and 9. Check the Project ICE Bibliography of available dress and phone number is on this guide's cover. Feel free to write materials or help.
f Audio Visual Instruction, 1327 University Avenue, P. O. Box 2093, 53701 (Phone: 608-262-1644).
a measurable mental skill, ability, or process based on factual data. to student attitudes, values, and feelings.

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	CESA #9
neconne	Peter Biolo, West DePere
ox Valley (L)	Lee Clasen, Lux.-Casco
tonville	Kathryn Colburn, Algoma
n, Winneconne	Merle Colburn, Algoma
d, Hortonville	Sara Curtis, Green Bay
Hortonville	Duane DeLorme, Green Bay
Winneconne	Roberta Dix, St. Joseph Acad.
nasha	Janet Elinger, Ashwaubenon
neconne	Phyllis Ellefson, Wash. Isle.
dom	Keith Fawcett, West DePere
t, Holy Angels	Jack Giachino, Seymour
St. Aloysius	Mike Gleffe, St. Matthews
Appleton	Herbert Hardt, Gibraltar
, New London	Gary Heil, Denmark
hkosh	Nannette Hoppe, How.-Suam.
neconne	Joseph Hucek, Pulaski
nte, St. John High	Catherine Huppert, DePere
Hortonville	DeAnna Johnson, Denmark
ah	Kris Karpinen, West DePere
, St. Martin (L)	Mel Kasen, Gibraltar
tle Wolf	Jack Koivisto, Green Bay
enah	Sister Mary Alyce, Cathedral
hiocton	Ellen Lotz, West DePere
ourdes	Judilyn McGowan, Green Bay
St. Martin (L)	Priscilla Mereness, Wrightstown
Clintonville	C. L. Paquet, Denmark
Martin (L)	William Roberts, Sturgeon Bay
ittle Wolf	Roger Roznowski, Southern Door
pleton	Jan Serrahn, Sevastopol
uer, Menasha	Calvin Siegrist, How.-Suam.
Kaukauna	Mary Smith, Green Bay
e Chute	Carol Trimberger, Kewaunee
Calvary (L)	Mary Wadzinski, How.-Suam.
, Oshkosh	
Little Chute	
, Holy Name	
. Margaret Mary	
berly	
nasha	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Mathematic
1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.	Subject	Numeratio
	Problem Orientation	Ecologica

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIE	
Cognitive: The child will measure the number of days a plant can live without sunlight. Affective: The child will demonstrate that plants need sunlight in order to live and grow. Skills to be Learned Observation Problem Solving Recording Investigating Experimentation Measuring - inches and meters	I. Student-Centered in class activity A. The class will find the answer to the following questions. 1. How long can a plant live without sunlight? Compute the number of days. 2. What happens to a plant that receives no energy from the sun. B. The class will demonstrate how long it takes a plant to die when it is deprived of sunlight, compute days and hours. 1. Place plant in dark place without sunlight. 2. Water plant regularly. 3. See that there is sufficient oxygen. 4. Class count the number of days until change takes place in the plant. 5. Record change in color, texture and vitality of plant. (continued on reverse side)	II. Outsi Commu A. Invi to class on plan 1. He many p per sq B. Visi to see live in light. C. In s greenho to dete the mos much mo D. They the gre light o How many E. Flor the eff sunligh

ati e Discipline Area Mathematics

tio ed Subject Numeration

ica o Problem Orientation Ecological Cycles Grade 3

for life processes.

RIE SUGGESTED LEARNING EXPERIENCES

tsi udent-Centered in class
mmu tivity

nvi The class will find the
las wer to the following ques-
lan ns.
He w How long can a plant
y p ve without sunlight?
sq mpute the number of days.
isi What happens to a
ee ant that receives no en-
in gy from the sun.
t. The class will demonstrate
n s long it takes a plant
nho die when it is deprived of
ete light, compute days and
mos rs.
mo Place plant in dark place
hey thout sunlight.
gre Water plant regularly.
t o See that there is suf-
man cient oxygen.
lor Class count the number of
eff ys until change takes place
igh the plant.
Record change in color,
xture and vitality of plant.
ontinued on reverse side)

II. Outside Resource and Community Activities

A. Invite florist to speak to class on effect of sunlight on plants in a greenhouse.
1. He will tell class how many plants can be served per square foot of sunlight.

B. Visit to a greenhouse to see how many plants can live in a given area of sunlight.

C. In small groups at the greenhouse students will try to determine which plants need the most sunlight and how much more.

D. They will find out how the greenhouse supplies sunlight on cloudy days. How many hours per year?

E. Florist will demonstrate the effect of too little sunlight on plants.

Resource and Reference Materials	Continued and Additional Sugge
Publications: McDonald, Char and Earnest Study in Plant Succession from VF at Project I-C-E RMC 110 SA Living Things in Field and Classroom - I-C-E RMC "People and their Environment" Teachers' Curriculum Guide to Conservation Education I-C-E 170 Lr. RMC	I. Continued C. Children will show actual growth that has been deprived with one that receives an ade measurement in inches or mete D. Children will find out thr some plants need more sunligh more do they need? Subtract r
Audio-Visual: 6743 Green Plants and Sun- light BAVI 5732 Sun: Friend or Foe? 11 min. $4.50 BAVI 1969	
Community: Greenhouse Florist Gardens	

Continued and Additional Suggested Learning Experiences

I. Continued

C. Children will show actual difference in a plant's growth that has been deprived of sunlight. Compared with one that receives an adequate supply by daily measurement in inches or meters.

D. Children will find out through experimentation that some plants need more sunlight than others. How much more do they need? Subtract number of days needed.

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CONCEPT	Discipline Area Mat
2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.	Subject Mu
	Problem Orientation i

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The learner will calculate the increase or decrease of population within an ecosystem. Affective: The learner will propose ways to preserve different ecosystems. Skills to be Learned 1. digit multiplication 2. addition 3. subtraction 4. interpretation	I. Student-Centered in class activity A. The student is given an ecosystem to work with. 1. Give a detailed list and numbers of the items in the ecosystem. In a pond: cattails 10 crayfish 32 bullheads 24 frogs 16 algae 1,750,652 water bugs 127 2. Create problems which indicate either multiplication of the plant and anima population or decrease of the population. a. On a warm day the algae multiplied and 2,220,443 new algae were m le. How many do you ha ow? What will this d to the pond? b. Twelve frogs laid eggs. Of all the eggs laid 7 from each frog grew into tadpoles and young frogs. How many frogs are in the pond (continued on reverse side)

Mat act | Discipline Area Mathematics

Mu n- | Subject Multiplication

on i ate | Problem Orientation Life Cycles | Grade 3

ARNIN

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

. The student is given an cosystem to work with.

.. Give a detailed list and numbers of the items in the cosystem. In a pond:

cattails	10
crayfish	22
bullheads	24
frogs	16
algae	1,750,652
water bugs	127

.. Create problems which indicate either multiplication of the plant and animal population or decrease of the population.

a. On a warm day the algae multiplied and 2,220,443 new algae were made. How many do you have now? What will this do to the pond?

b. Twelve frogs laid eggs. Of all the eggs laid 7 from each frog grew into tadpoles and young frogs. How many frogs are in the pond

(continued on reverse side)

II. Outside Resource and Community Activities

A. Have a DNR representative speak on the establishment of a pond.

B. Visit a pond in the area Do actual counting of members in the pond.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Ecology - Fresh Waters and Man at I-C-E RMC Ecolab Kit 21 SCIS Organisms 110 CA SCIS Environments 110 LA SCIS Life Cycles 110 BU Audio-Visual: "Nature's Half Acre" FM 210 at I I-C-E RMC "Life in a Pond" BAVI "Life in an Aquarium" BAVI Community: DNR representative	I. continued b. now? What does this do to t c. The farmer sprayed his fiel bugs died. How many bugs were do to the pond. B. Play Web Game 1. Put the names of members of paper. You will need yarn. 2. Give the students each an id (frog, water bug, etc) Then sta The yarn gets passed to somethi first member. 3. Continue passing until the w 4. One member drops out, What h 5. Discuss interpendence in an

		Continued and Additional Suggested Learning Experiences
este	rials	I. continued
to t fiel ere	Man	b. now? What does this do to the pond? c. The farmer sprayed his field with DDT. 96% of the bugs died. How many bugs were left? What does this do to the pond. B. Play Web Game 1. Put the names of members of the ecosystem onto paper. You will need yarn. 2. Give the students each an identification card. (frog, water bug, etc) Then start the yarn at one member The yarn gets passed to something that affects the first member. 3. Continue passing until the web develops. 4. One member drops out, What happens? 5. Discuss interpendence in an ecosystem.
of		
n id sta ethi		
ne w at h an	at I	

CONCEPT

3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.

Discipline Area

Subject

Problem Orientation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The student will show, by multiplication, the total number of mice in three equal litters. Affective: By applying the principle of food control to three other living things the students will demonstrate an understanding that each environment has a carrying capacity. Skills to be Learned 1. Locating information in an encyclopedia. 2. Basic multiplication facts 3. Drawing inferences.	I. Student-Centered in class activity A. Students use an encyclopedia to find the average number of baby mice per litter. B. Using the above information work the following problems 1. How many babies will one mother mouse have in two different births? 2. How many babies will two mother mice have in two different births? C. Discuss. What would happen if the mice population would increase in this manner without anything stopping them? 1. Would this be true of any living thing? 2. What would prevent the mice from multiplying so rapidly? 3. What would happen to the mice if they multiplied so fast that they wouldn't have enough food?

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ors are limit-

organisms

nfluence, thus,

a carrying capacity.

Discipline Area Mathematics

Subject Multiplication

Problem Orientation Population Growth Grade 3

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Students use an encyclopedia to find the average number of baby mice per litter.

B. Using the above information work the following problems

1. How many babies will one mother mouse have in two different births?

2. How many babies will two mother mice have in two different births?

C. Discuss. What would happen if the mice population would increase in this manner without anything stopping them?

1. Would this be true of any living thing?

2. What would prevent the mice from multiplying so rapidly?

3. What would happen to the mice if they multiplied so fast that they wouldn't have enough food?

II. Outside Resource and Community Activities

A. Local fields (the habitat of field mice)

B. Local farms (barns for rats and mice)

C. Relate to Science class where they raise mice, gerbals etc.

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: 190 Kit Kimball, Richard, 1971 Too Many People, I-C-E RMC Ecology - Research in Science I-C-E RMC 1969 Ecology - McCue, George 130 Mc I-C-E Audio-Visual: Pet Gerbals McGraw Hill Study Pictures a. "Animal Disguises" b. "Pond Life" c. "Animal Babies" I-C-E RMC No. K-19 Community: 1. Have farmer come in to discuss the damage done on farms by rats and mice. 2. Have science student show live mice and rats to pupils so they recognize them.	

ning	ls	Continued and Additional Suggested Learning Experiences

CONCEPT 4. An adequate supply of pure water is essential for life.

Discipline Area Mathemati

Subject Numeratio

Problem Orientation Water Con

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
Cognitive: The student will tabulate numbers and record the amount of water needed for daily living. Affective: The student will demonstrate a consciousness that water needs to be conserved for the future by showing how water is used. Skills to be Learned Observation Counting Discussion Listing Tabulating	I. Student-Centered in class activity A. The student will count and record the number of times he uses water in a day by measuring it in standard measurement. 1. Water used for drinking. 2. Water used for washing and bathing, tooth brushing, etc. 3. Water used in laundering 4. Water used in washing dishes and cleaning home. 5. Amount used in other ways by child. B. He will make a chart showing amount of water used daily, weekly and monthly by an individual in cups. C. Make chart showing where water comes from. D. After discussing how water could be saved, have child record and compare the amount of water used in brushing teeth at the beginning of the activity with amount used after (continued	II. Outsi Commu A. Trip ment to is used B. Have conserva and demo water.

ESEA Title III - 59-70-0135-2 Project I-C-E

mati uate supply of pure

atio s essential for life.

Con

Discipline Area Mathematics

Subject Numeration

Problem Orientation Water Consumption Grade 3

PERI ORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
itsi The student bmmu te numbers and rip amount of water to daily living. sed ave erva lemo The student . crate a con- that water conserved for by show how ed. e Learned	I. Student-Centered in class activity A. The student will count and record the number of times he uses water in a day by measuring it in standard measurement. 1. Water used for drinking. 2. Water used for washing and bathing, tooth brushing, etc. 3. Water used in laundering 4. Water used in washing dishes and cleaning home. 5. Amount used in other ways by child. B. He will make a chart showing amount of water used daily, weekly and monthly by an individual in cups. C. Make chart showing where water comes from. D. After discussing how water could be saved, have child record and compare the amount of water used in brushing teeth at the beginning of the activity with amount used after	II. Outside Resource and Community Activities A. Trip to local water department to learn about how water is used by the community. B. Have representative of conservation department talk and demonstrate ways to save water.

ued

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested L
Publications: Running Water at I-C-E RMC 120 MA 5 Story of Water Supply (Free in quantities of 35) (comic book type) Menasha Electric and Water Utilities P.O. Box 340 Menasha, Wisconsin Audio-Visual: City Water Supply $2.00 BAVI Water $2.00 BAVI Water Pollution $2.00 BAVI Community: City Water Department Conservation Department	I. continued D. Class discussion on conserving

ed	erence Materials	Continued and Additional Suggested Learning Experiences
ving	I-C-E RMC upply (Free in) (comic book and Water in $2.00 $2.00 ment artment	I. continued D. Class discussion on conserving water.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area Mai
5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.	Subject Ver
	Problem Orientation A

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The student will construct a simple vertical bar graph and through comparison be able to select the greatest offender in producing suspended particles. Affective: In a discussion the student will voluntarily suggest that something must be done about the problem of suspended particles. Skills to be Learned 1. Vertical bar graphs 2. Comparison 3. Drawing inferences	I. Student-Centered in class activity A. Suspended Particles 1. Teacher construct a set of six simple vertical bar graphs, numbering each from 0-50, on a master ditto and run off one for each student. 2. Have students fill in with color and label each of the graphs using the following title, terms and numbers. Suspended Particles a. Industrial 45% b. Power Plants 28% c. Refuse disposal 9 % d. Residential 6 % e Industrial process 5% f Transportation 7% The percentage symbols are given for teacher benefit only. Not to be used on graphs. 3. Teacher may have to explain the above terms. (continued on reverse side)

n adequate supply of clean
is essential because most
nisms depend on oxygen, through
iration, to release the energy
heir food.

Discipline Area Mathematics

Subject Vertical bar graphs and comparison

Problem Orientation Air pollution Grade 3

AVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
e: The student will t a simple verti- graph and through on be able to he greatest offen- roducing suspended s. e: In a dis- he student ntarily sug- t something must bout the prob- uspended parti- / be Learned cal bar graphs rison ng inferences/	I. Student-Centered in class activity A. Suspended Particles 1. Teacher construct a set of six simple vertical bar graphs, numbering each from 0-50, on a master ditto and run off one for each student. 2. Have students fill in with color and label each of the graphs using the following title, terms and numbers. Suspended Particles a. Industrial 45% b. Power Plants 28% c. Refuse disposal 9 % d. Residential 6 % e Industrial process 5% f Transportation 7% The percentage symbols are given for teacher benefit only. Not to be used on graphs. 3. Teacher may have to explain the above terms. (continued on reverse side)	II. Outside Resource and Community Activities A. Observation of vehicles on streets and highways B. Invite city engineer to explain what is being done to control suspended particles. Have students check filters in air conditioners or furnaces in their own homes to see the amount of suspended particle accumulation that is filtered in their own homes.

Resource and Reference Materials	Continued and Additional Suggested Learning E
Publications: Pollution - Problems Projects Wisconsin Dept. of public instruction I-C-E RMC Carr, Donald E. The Breath of Life Norton 1965 "Minnesota air quality Regulation" Metro Clean Air Committee 1829 Portland Avenue Minneapolis, Minnesota I-C-E RMC Audio-Visual: Teacher prepare a number of graphs on transparencies to show and use for discussion about the use of graphs. Community: City Engineer Sites of Local industry Streets and highways (vehicle observation) DNR official to discuss effects of pesticides on bird and animal life	I. continued 4. After graphs have been filled in have s comparisons. Examples follow: a. Which produces the most amount of sus cles. b. Which produces the least amount of su particles. c. Use questions involving greater than 5. Discuss briefly the harm to life caused ed particles. 6. Discuss what might be done to reduce th suspended particles and explain what is be

		Continued and Additional Suggested Learning Experiences
ng E	als	I. continued 4. After graphs have been filled in have students make comparisons. Examples follow: a. Which produces the most amount of suspended particles. b. Which produces the least amount of suspended particles. c. Use questions involving greater than and less than. 5. Discuss briefly the harm to life caused by suspended particles. 6. Discuss what might be done to reduce the amount of suspended particles and explain what is being done.
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han	ion"	
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CONCEPT

6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area: Mathematics

Subject: Problem Solv

Problem Orientation: Resource U

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIEN	
Cognitive: Given a section of land with the amount of natural resources it contains the students will calculate the amount of time before resources are consumed. Affective: The student will become aware, through computating that our resources do not come from an endless supply. Skills to be Learned Basic Computations Problem Solving	I. Student-Centered in class activity A. Find out if every person uses five gallons of oil in one day, in a town of 100 people. 1. How long would it take to use the oil in a well that contains 4,000 gallons of oil. 2. 5,000 gallons. 3. 6,000 gallons. B. If the people in the town of 100 people each use 30 gallons of water per day. 1. How long will 6,000 gallons last? 2. 9,000 gallons? 3. 12,000 gallons? C. If a lake contains 1400lbs. of fish and each of 100 persons eats 2 lbs. of fish a week. How long will the fish supply last?	II. Outsid Commun A. Speake explain a program. 1. What things we a. fish b. pheas c. deer

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ics ...ural resources are not ...y distributed over the earth ...c time and greatly affect the ...phic conditions and quality of

Discipline Area Mathematics

Subject Problem Solving

Problem Orientation Resource Use Grade 3

RIEN	...IORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
csid... amun... ake... n a ...m. at ... s we... ish ...heas... eer	Given a sec- ...d with the amount resources it con- ...udents will cal- ...mount of time ...rces are con-	I. Student-Centered in class activity A. Find out if every person uses five gallons of oil in one day, in a town of 100 people. 1. How long would take to use the oil in a well that contains 4,000 gallons of oil. 2. 5,000 gallons. 3. 6,000 gallons. B. If the people in the town of 100 people each use 30 gallons of water per day. 1. How long will 6,000 gallons last? 2. 9,000 gallons? 3. 12,000 gallons? C. If a lake contains 1400lbs. of fish and each of 100 persons eats 2 lbs. of fish a week. How long will the fish supply last?	II. Outside Resource and Community Activities A. Speaker from the DNR to explain a resource stocking program. 1. What would happen if some things were not restored. a. fish b. pheasants c. deer (re-routed)
	The student aware, through that our re- ...ot come from ...upply.		
	...e Learned ...ations ...ing		

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: 170 American Petroleum Institute 1968 PC Conserving our Waters and Cleaning the Air. I-C-E RMC Audio-Visual: K1 "American Petroleum Institute" 1965 8"Conservation: A picture discus .on Kit" I-C-E RMC Community: DNR representative	

ing	e Materials	Continued and Additional Suggested Learning Experiences
	m Institute	
	ers and -E RMC	
	m	
	cture	

C O N C E P T 7. Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.

Discipline Area Mathemat

Subject Arithmet

Problem Orientation Popula bution

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPE	
Cognitive: After being given a class sheet pertaining to population, the students compute the population gain for each state from the years 1960-1975. Affective: By observing and discussing the results of the worksheet the students will realize some of the factors leading to and problems with population growth. Skills to be Learned Arithmetic computation skills: addition and subtraction involving borrowing Comparing size of numbers Analyzing data	I. Student-Centered in class activity A. Population sheet Teacher hand out sheet to students. Students compute the population gain for each state. A few problems could be done on board as examples. B. Other questions the teacher could have the students answer are as follows: 1. Which state had the most population in 1960? the least? 2. Most in 1975? least in 1975? 3. Which state's population increased the most? the least? 4. Did any state's population drop? Which one? 5. How much population gain did we have in Wisconsin? 6. List in order from largest to amallest the 10 states that had the biggest population increase. (continued on reverse side)	II. O Co A. Th given diffe maps calcu creas certa B. Ha or sc a tal tory as: p schoo shopp C. Ha discu schoo popul

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ch as facilitating

n, economic conditions,

owth, and increased

have a great influence

land use and centers of population density.

Discipline Area Mathematics

Subject Arithmetic Computation

Problem Orientation Population distribution and growth

Grade 3

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
being et per- tion, the the pop- each state 60-1975. serving e results the stu- e some of ng to and ulation ned ation nd ving num-	I. Student-Centered in class activity A. Population sheet Teacher hand out sheet to students. Students compute the population gain for each state. A few problems could be done on board as examples. B. Other questions the teacher could have the students answer are as follows: 1. Which state had the most population in 1960? the least? 2. Most in 1975? least in 1975? 3. Which state's population increased the most? the least? 4. Did any state's population drop? Which one? 5. How much population gain did we have in Wisconsin? 6. List in order from largest to amallest the 10 states that had the biggest population increase. (continued on reverse side)	II. Outside Resource and Community Activities A. The students could be given two state maps for different years. From the maps they could be asked to calculate population increases or decreases for certain cities. B. Have the city's mayor, or some city official, give a talk on the city's history concerning such points as: population, land use, schools, parking lots, shopping centers, etc. C. Have the school principal discuss the origin of the school as pertaining to population growth.

Resource and Reference Materials

Publications:

"Population Growth and America's Future" U.S. Government Printing Office

Audio-Visual:

1581 "Population Patterns in the U.S." (11 min); 1961 BAVI
6937 "Population Problem U.S.A. Seeds of Change" (30 min) 1967 BAVI

Community:

Talk by city official

Continued and Additional Suggested L

I. continued

7. Name some reasons why a states have increased.

POPULATION SHEET

State	1960 Population	1 Popula
Alabama	3,267,000	3,922,0
Alaska	226,000	328,0
Arizona	1,302,000	2,126,0
Arkansas	1,786,000	2,184,0
California	15,717,000	24,129,0
Colorado	1,754,000	2,340,0
Connecticut	2,535,000	3,397,0
Delaware	446,000	617,0
Florida	4,952,000	7,720,0
Georgia	3,943,000	5,142,0
Hawaii	633,000	812,0
Idaho	667,000	760,0
Illinois	10,081,000	11,840,0
Indiana	4,662,000	5,417,0
Iowa	2,758,000	2,807,0
Kansas	2,179,000	2,397,0
Kentucky	3,038,000	3,400,0
Louisiana	3,257,000	4,162,0
Maine	969,000	1,031,0
Maryland	3,101,000	4,359,0
Massachusetts	5,149,000	5,842,0
Michigan	7,823,000	9,259,0
Minnesota	3,414,000	3,905,0
Mississippi	2,178,000	2,560,0
Missouri	4,320,000	4,870,0
Montana	675,000	764,0
Nebraska	1,411,000	1,538,0

(continued on next page)

Reference Materials	Continued and Additional Suggested Learning Experiences
Growth and America's Government Printing Lion Patterns in the); 1961 BAVI ion Problem U.S.A. ge" (30 min) official	I. continued 7. Name some reasons why a states population could have increased.

POPULATION SHEET

State	1960 Population	1975 Population	Population Gain 1960-1975
Alabama	3,267,000	3,922,000	
Alaska	226,000	328,000	
Arizona	1,302,000	2,126,000	
Arkansas	1,786,000	2,184,000	
California	15,717,000	24,129,000	
Colorado	1,754,000	2,340,000	
Connecticut	2,535,000	3,397,000	
Delaware	446,000	617,000	
Florida	4,952,000	7,720,000	
Georgia	3,943,000	5,142,000	
Hawaii	633,000	812,000	
Idaho	667,000	760,000	
Illinois	10,081,000	11,840,000	
Indiana	4,662,000	5,417,000	
Iowa	2,758,000	2,807,000	
Kansas	2,179,000	2,397,000	
Kentucky	3,038,000	3,400,000	
Louisiana	3,257,000	4,162,000	
Maine	969,000	1,031,000	
Maryland	3,101,000	4,359,000	
Massachusetts	5,149,000	5,842,000	
Michigan	7,823,000	9,259,000	
Minnesota	3,414,000	3,905,000	
Mississippi	2,178,000	2,560,000	
Missouri	4,320,000	4,870,000	
Montana	675,000	764,000	
Nebraska	1,411,000	1,538,000	

(continued on next page)

POPULATION SHEET (Continued)

State	1960 Population	1975 Population	Popul 1960
Nevada	285,000	632,000	
New Hampshire	607,000	800,000	
New Jersey	6,067,000	8,156,000	
New Mexico	951,000	1,215,000	
New York	16,782,000	20,450,000	
North Carolina	4,556,000	5,596,000	
North Dakota	632,000	677,000	
Ohio	9,706,000	11,461,000	
Oklahoma	2,328,000	2,655,000	
Oregon	1,769,000	2,239,000	
Pennsylvania	11,319,000	12,141,000	
Rhode Island	859,000	959,000	
South Carolina	2,383,000	2,865,000	
South Dakota	681,000	702,000	
Tennessee	3,567,000	4,345,000	
Texas	9,580,000	12,482,000	
Utah	891,000	1,207,000	
Vermont	390,000	441,000	
Virginia	3,967,000	5,243,000	
Washington	2,853,000	3,304,000	
West Virginia	1,860,000	1,755,000	
Wisconsin	3,952,000	4,557,000	
Wyoming	330,000	354,000	

POPULATION SHEET (Continued)

opul 1960	1960 Population	1975 Population	Population Gain 1960-1975
	285,000	632,000	
re	607,000	800,000	
	6,067,000	8,156,000	
	951,000	1,215,000	
	16,782,000	20,450,000	
ina	4,556,000	5,596,000	
a	632,000	677,000	
	9,706,000	11,461,000	
	2,328,000	2,655,000	
	1,769,000	2,239,000	
a	11,319,000	12,141,000	
u	859,000	959,000	
na	2,383,000	2,865,000	
:	681,000	702,000	
	3,567,000	4,345,000	
	9,580,000	12,482,000	
	891,000	1,207,000	
	390,000	441,000	
	3,967,000	5,243,000	
	2,853,000	3,304,000	
a	1,860,000	1,755,000	
	3,952,000	4,557,000	
	330,000	354,000	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject	Problem Orientation
8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.	Mathematics	Charts and Tabul	Noise Polluti

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCE	
Cognitive: The student will detect man's monetary values and attitudes toward his environment by tabulating a poll chart. Affective: The student will actively participate in composing a letter to a manufacturer offering some concrete suggestions based upon conclusions drawn from the poll chart. Skills to be Learned 1. Charts 2. Tabulations 3. Drawing influences 4. Drawing conclusions 5. Polling	I. Student-Centered in class activity A. Make plans to poll two mothers per pupil and plan so there will be no duplication of households. Use these questions or a set of your own that would be relevant to your community. 1. Would you be willing to pay $99.00 for a less noisy vacuum cleaner if the same model, but noiser was available for $90.00? 2. Would you be willing to pay $1.25 more for a less noisy hair dryer? 3. Would you be willing to pay $5.00 more for a less noisy lawn mower? B. Tabulate your results on a chart recording yes, no, and undecided responses. C. If you can come to any conclusions that might influence a manufacturer, have pupils compose a letter explaining what you have done and offer some concrete suggestions to him for future	II. Outside Community A. Poll loca electric app for the kind purchased li appliances t ed in the ch B. Make tape various nois cluding thos 1. Compare using great than, and e tions.

(continued on reve

economic, social,	Discipline Area Mathematics
l factors determine	Subject Charts and Tabulation
n's values and atti-	Problem Orientation Noise Pollution Grade 3
his environment.	

OBJECTIVES	SUGGE TED LEARNING EXPERIENCES	
student 's monetary tudes toward by tabula- rt. e student articipate etter to offering ggestions usions oll chart. rned ences usions	I. Student-Centered in class activity A. Make plans to poll two mothers per pupil and plan so there will be no duplication of households. Use these questions or a set of your own that would be relevant to your community. 1. Would you be willing to pay $99.00 for a less noisy vacuum cleaner if the same model, but noiser was available for $90.00? 2. Would you be willing to pay $1.25 more for a less noisy hair dryer? 3. Would you be willing to pay $5.00 more for a less noisy lawn mower? B. Tabulate your results on a chart recording yes, no, and undecided responses. C. If you can come to any conclusions that might influence a manufacturer, have pupils compose a letter explaining what you have done and offer some concrete suggestions to him for future	II. Outside resource and Community Activities A. Poll local hardware or electric appliance dealers for the kinds of appliances purchased limiting the appliances to the 3 mentioned in the chart. B. Make tape recordings of various noise producers including those in the chart. 1. Compare noise output using greater than, less than, and equal to, questions.

(continued on reverse side)

Resource and Reference Materials

Publicaitons:

Sound and Silence VF I-C-E RMC
Noise Pollution O'Donnell and Lavaroni, Addison and Wesley

Audio-Visual:

1 7550 Noise (film) color 10 min. $4.75 BAVI 1970
3973 Noise is Pollution, Too (film) 12 min. $5.75 BAVI
Magazine pictures of noise producers.

Community:

Local library for other publications on noise pollution.

County or city nurse to discuss effects of noise pollution on hearing.

Continued and Additional Suggested

I. Continued
C. production plans.
D. Have city or county nurse talk of noise pollution on hearing.

Sounds in our Environment (R

Keep a record and compare (

Indoors

What produced the sound	Sound Description	No of scund heard

Outdoors

1. Using this same outline, go out night and listen for 15 minutes. and compare to sounds heard in the
2. Do further research to learn ho body's functioning.
3. Do some research on the topic o and how it affects human beings. I sources of noise pollution in your suggestions for the elimination of be harmful.

Materials	Continued and Additional Suggested Learning Experiences
-C-E RMC ell and sley or Too VI se pub- tion. discuss on on	I. Continued C. production plans. D. Have city or county nurse talk about the effects of noise pollution on hearing. Sounds in our Environment (Resource Sheet) Keep a record and compare (15 min.) Indoors What produced the sound / Sound Description / No of times sound was heard / Was it loud or soft? / Pleasant or unpleasant Outdoors 1. Using this same outline, go outside your home at night and listen for 15 minutes. Record your findings and compare to sounds heard in the daytime. 2. Do further research to learn how sounds affect the body's functioning. 3. Do some research on the topic of "Noise pollution" and how it affects human beings. Identify the main sources of noise pollution in your community. Make suggestions for the elimination of noises which may be harmful.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT		
9. Man has the ability to manage, manipulate, and change his environment.	Discipline Area	n h
	Subject	ula
	Problem Orienta	men

BEHAVIORAL OBJECTIVES	SUGGESTED L
Cognitive: The student will be able to compare the amount of litter in different environments by counting the number of pieces of litter in each environment. Affective: The students will realize that by littering he adversely affects and changes his environment. Skills to be Learned Counting Tabulation with fractions Compiling data	I. Student-Centered in class activity A. Each student will count the pieces of litter in the classroom, school yard, and school halls. 1. With the above information the student will make list of the different type of litter, the number of pieces of each. The studen will make a circle and div the circle into sections. section will represent a type of litter the student found. The sections should vary in size according to the number of pieces of ea type of litter the student found. B. The students will tabula by rooms the amount of litt in waste baskets. Then they will indicate the amount of litter for each grade. C. Work out these problems. 1. Most Americans throw away about 5 pounds of trash a day. How many poun (continued on reverse side

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n has the ability to manage,
ulate, and change his en-
ment.

Discipline Area Mathematics

Subject Fractions

Problem Orientation Litter Grade 3

HAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
e: The student able to compare the f litter in differ- ronments by counting er of pieces of lit- ach environment. e: The students lize that by lit- e adversely affects ges his environment. o be Learned on with fractions g data	I. Student-Centered in class activity A. Each student will count the pieces of litter in their classroom, school yard, and school halls. 1. With the above information the student will make a list of the different types of litter, the number of pieces of each. The student will make a circle and divide the circle into sections. Each section will represent a type of litter the students found. The sections should vary in size according to the number of pieces of each type of litter the students found. B. The students will tabulate by rooms the amount of litter in waste baskets. Then they will indicate the amount of litter for each grade. C. Work out these problems. 1. Most Americans throw away about 5 pounds of trash a day. How many pounds (continued on reverse side)	II. Outside Resource and Community Activities A. The students will take a litter count in their own yard and report to the teacher on their findings. B. Visit the school incinerator. C. Have a school custodian describe work and problems caused by litter. D. Have the city's director of Public Works give a talk on the problems caused by litter in the city. E. Also the teacher might have the school's principal stop in and give a quick "anti-litter" plug.

Resource and Reference Materials	Continued and Additional Sugge
Publications: 100 MA Congressional Quarterly 1970 Man's Control of the Environment - to determine his survival so that he doesn't lay waste to his planet. Audio-Visual: film "Garbage" I-C-E RMC 5263 "Biology: Population Ecology" (color) (EBF) 1963 6878 "Land Betrayed" (color) (10 min) BAVI Communtiy: Director of Public Works Department of Natural Resources	I. (Continued) C. 1. is this in 5 days? In 7 d 2. How many pounds of trash away a day? 3. Most Americans use about cans is this in 4 weeks? In 4. How many cans does a fami 5. Most Americans use about many bottles is this in 4 we 6. One 1965 car pollutes the 1970 cars. How many 1965 car much as 45 1970 cars? 7. In 1970 a family of 6 per 40 bottles and cans a week. Keep track of the number o family throws away in one we

Materials	Continued and Additional Suggested Learning Experiences
arterly vironment ival so that his rbage" on 1963 olor)	I. (Continued) C. 1. is this in 5 days? In 7 days? 2. How many pounds of trash does a family of 6 throw away a day? 3. Most Americans use about 4 cans a week. How many cans is this in 4 weeks? In 8 weeks? 4. How many cans does a family of 6 use in a week? 5. Most Americans use about 3 bottles a week. How many bottles is this in 4 weeks? In 8 weeks? 6. One 1965 car pollutes the air as much as five 1970 cars. How many 1965 cars pollute the air as much as 45 1970 cars? 7. In 1970 a family of 6 persons threw away about 40 bottles and cans a week. Keep track of the number of bottles and cans your family throws away in one week.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area
10. Short-term economic gains may produce long-term environmental losses.	Subject
	Problem Orienta

BEHAVIORAL OBJECTIVES	SUGGESTED L
Cognitive: The pupil will construct a graph on a flannelgraph showing the "villains" of water pollution. Affective: The pupil will suggest to his parents some ways of preventing waste from entering the water streams. Skills to be Learned 1. Construction of flannelgraph. 2. Basic multiplication. 3. Grouping by fives.	I. Student-Centered in clas activity A. The Villains of Water Pollution 1. Use flannelgraph to he students to visualize fol lowing numbers. Use squar or rectangles of the same size. a. Industry - 65% b. Municipal - 20% c. Agriculture - 15% Note: Instead of percen symbols use one hundred a being the whole and one square or rectangle to re present five parts of the whole. B. Have students work the following problems culmina ting with students placing the correct number of squa or rectangles on the flanne graph. 1. How many squares will needed to represent indus try's part in water pol- lution. (continued on reverse side

Short-term economic gains may
uce long-term environmental
es.

Discipline Area Mathematics

Subject Addition and/or Multiplication and/or grouping.

Problem Orientation Waste and water control

Grade 3

HAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
ve: The pupil nstruct a graph on elgraph showing llains" of water on. ve: The pupil ggest to his some ways of ing waste from g the water . to be Learned truction of graph. c multiplication. ping by fives.	I. Student-Centered in class activity A. The Villains of Water Pollution 1. Use flannelgraph to help students to visualize following numbers. Use squares or rectangles of the same size. a. Industry - 65% b. Municipal - 20% c. Agriculture - 15% Note: Instead of percent symbols use one hundred as being the whole and one square or rectangle to represent five parts of the whole. B. Have students work the following problems culminating with students placing the correct number of squares or rectangles on the flannelgraph. 1. How many squares will be needed to represent industry's part in water pollution. (continued on reverse side)	II. Outside Resource and Community Activities A. Visit a nearby stream and search for signs of water pollution. B. Invite city health inspector to speak to the class about local water pollution.

Resource and Reference Materials	Continued and Additional Suggested
Publications: Running Water I-C-E 120 MA 5 RMC The Fresh Water I-C-E RMC 130 MC 6 Pollution: A Handbook for Teachers inexpensive paperback from Scholastic Book Services Air and Water Pollution, Gerald Leinwald, Washington Square Press, 1969 Death of Sweet Water, Don Carr, Norton, 1966 The Water Lords, Ralph Nader's Study Group, Grossman Publish, 1971 Audio-Visual: 2903 Water Around Us (22 min) Movielct 1952 Water Famine 54 min. Association Films, 600 Grand Avenue., Ridgefield, New Jersey 07657 Problem with Water is People (30 min) McGraw Hill Contemporary films, 330 West 42nd Street, New York, New York 10018 Community: DNR official Water Disposal plant official Paper Mill official (Pollution expert) Factory Pollution expert County Ag. Extension agent	I. continued 2. How many squares represent Mu term to students) part in water 3. How many squares will be need culture's part in water pollutio 4. What is the total number of p C. Teacher note - make certain tha made to appear as the "bad buy". I what we want and will buy. Some de used for washing add pollutants to fertilizers that farmers use drain and add wastes to water. These fig those wastes that take oxygen out D. Teacher should mention some of people are trying to eliminate wat not leave the children with a comp E. Discuss effects of farming on p to point out that cattle pollute l control over both the cattle and h

ference Materials	Continued and Additional Suggested Learning Experiences
I-C-E 120 MA 5 I-C-E RMC ndbook for Teach- e paperback from Services ollution, Gerald ngton Square Press, Water, Don Carr, , Ralph Nader's ossman Publish, nd Us (22 min) min. Association d Avenue., Jersey 07657 ter is People Hill Contempor- West 42nd Street, ork 10018 plant official cial (Pollution on expert nsion agent	I. continued 2. How many squares represent Municipal's (explain term to students) part in water pollution? 3. How many squares will be needed to represent agriculture's part in water pollution? 4. What is the total number of parts? C. Teacher note - make certain that industry is not made to appear as the "bad buy". Industry only makes what we want and will buy. Some detergents, that are used for washing add pollutants to water. Also certain fertilizers that farmers use drain off the fields and add wastes to water. These figures represent only those wastes that take oxygen out of the water. D. Teacher should mention some of the ways in which people are trying to eliminate water pollution. (Do not leave the children with a complete negative attitude. E. Discuss effects of farming on pollution. Be sure to point out that cattle pollute less than man. Man has control over both the cattle and himself.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject	Problem Orientation
11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.	Mathem	Ordere	Qua

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXP	
Cognitive: The learner will graph the increased land use caused by duplication of individual actions. Affective: The learner will propose ways of decreasing land use. Skills to be Learned 1. Coordinate points 2. Graphing 3. Subtraction 4. Interpretation ⋮	I. Student-Centered in class activity A. You will work on the land used when a home is built. 1. The homes in a wooded area are sold in lots of 2 acres each. 2. Set up a table. 3. Introduce a graph and co-ordinate points 4. Graph the increase on the co-ordinate graph 5. Discuss what happens to the forest as the land is gradually used up. B. Simulating an environmental change. 1. Give each student a shoe box or similar box - stand up triangles from a rig-a-jig to act as trees 2. Put a block into the box. This is a building. How many trees go? 3. Now introduce 3 or 4 blocks, How many trees go? C. Car Census 1. Count the cars that pass (continued on reverse side)	II. O C A. V deve are B. Re on

acts, duplicated

produce significant

alterations over

Discipline Area Mathematics

Subject Ordered Pairs

Problem Orientation Quality of Life Grade 3

JECTIVES	SUGGESTED LEARNING EXPERIENCES	
arner reased duplica- actions. arner of de- ed ts	I. Student-Centered in class activity A. You will work on the land used when a home is built. 1. The homes in a wooded area are sold in lots of 2 acres each. 2. Set up a table. 3. Introduce a graph and co-ordinate points 4. Graph the increase on the co-ordinate graph 5. Discuss what happens to the forest as the land is gradually used up. B. Simulating an environmental change. 1. Give each student a shoe box or similar box - stand up triangles from a rig-a-jig to act as trees 2. Put a block into the box. This is a building. How many trees go? 3. Now introduce 3 or 4 blocks, How many trees go? C. Car Census 1. Count the cars that pass (continued on reverse side)	II. Outside Resource and Community Activities A. Visit the site of a housing development to see how forests are being eaten up. B. Real Estate Person to speak on land development.

Resource and Reference Materials	Continued and Addition
Publications: Ecology the City Project I-C-E RMC 130 Mc Communtiy Planning Project I-C-E RMC 110GI Audio-Visual: FS St e Urban Ecology - Six Micro-organisms "A Construction Site" Kt 4 Man in His Environment-ICE-RMC "Cities are Different and Alike" BAVI Planning our Cities filmstrip rent from: Current Affairs Films Division of Key Productions 527 Madison Avenue New York, New York 10022 Community: Real Estate man City Planner	I. (continued) C. 1. by the building what would happen? 2. Graph results. 3. Discuss what hap there a way this co natural areas could D. Use "Man in His E

ials	Continued and Additional Suggested Learning Experiences
-E tion ICE-RMC ike" p rent	I. (continued) C. 1. by the building in 10 minutes. If the number doubled what would happen? If it tripled. 2. Graph results. 3. Discuss what happens when an act is duplicated. Is there a way this could be stopped or changed so that natural areas could be preserved. D. Use "Man in His Environment" Game

CONCEPT	Discipline Area	Subject	Problem Orientation
12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.	Mathe	Volum	Qual

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	II.
Cognitive: The learner will measure and record the volume of various areas. Affective: The learner will recommend better use of different spaces. Skills to be Learned 1. Volume 2. Measuring 3. Interpretation 4. Generalization	I. Student-Centered in class activity A. You will be working with volume and space 1. Use blocks and count blocks and volume needed. 2. Discuss the idea of space and using space. 3. Try to find out the space each person has at home. Discuss the needs that others have for space. Discuss rules to allow for personnel space. B. Use "Rescue in Space" Simulation Game Kt 4. 1. Use only the section on Space. Manual is very clear. 2. You may try measurement if possible . C. Use of space 1. Measure off an area in the room and have a student attempt to exercise in it. 2. Introduce more persons into the area or introduce objects into the area. Discuss what happens. 3. Discuss how putting things into an area or on your prop- (continued on reverse side)	A. in me B. re C. the

ESEA Title III - 59-70-0135-2 Project I-C-E

ownership must be re-
stewardship and should
upon or violate the
right of others.

Discipline Area Mathematics

Subject Volume

Problem Orientation Quality of Life Grade 3

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
learner will ord the us areas. learner better t spaces. arned on on	I. Student-Centered in class activity A. You will be working with volume and space 1. Use blocks and count blocks and volume needed. 2. Discuss the idea of space and using space. 3. Try to find out the space each person has at home. Discuss the needs that others have for space. Discuss rules to allow for personnel space. B. Use "Rescue in Space" Simulation Game Kt 4. 1. Use only the section on Space. Manual is very clear. 2. You may try measurement if possible . C. Use of space 1. Measure off an area in the room and have a student attempt to exercise in it. 2. Introduce more persons into the area or introduce objects into the area. Discuss what happens. 3. Discuss how putting things into an area or on your prop- (continued on reverse side)	II. Outside Resource and Community Activities A. Have a person who has lived in both city and rural environments discuss the space used. B. FHA person speak on housing requirements. C. Go to a city street and see the space allowed each person.

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications: Dr. Wang, Man and His Environment 160 Wa Proceedings of conference 1 I-C-E RMC Our Man Made Environment Book 7 I-C-E RMC 120 0 Kimball, Richard; Too Many People I-C-E RMC 190 Ki Audio-Visual: Communtiy: FHA Administrator City planner	I. (continued) C. 3. erty changes the way you can use things others can do on it. 4. Where have you seen your rights e by another's use of space?

rence Materials	Continued and Additional Suggested Learning Experiences
His Environment s of conference conment Book 7 Too Many 190 Ki	I. (continued) C. 3. erty changes the way you can use it or changes the things others can do on it. 4. Where have you seen your rights encroached upon by another's use of space?

PROJECT I-C-E Episode Evaluation Form (Reproduce or du

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode used i
form. Feel free to adapt it and add m
your critiques and comments - negative
hand column, please rate (poor, good,
make specific comments or suggestions
vided to help us make this a more usab

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

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In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

I. Behavioral Objectives
A. Cognitive:

B. Affective:

II. Skills Developed

III. Suggested Learning Experiences
A. In Class:

B. Outside & Community Activities:

IV. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, WI 54301

Project I - C - E INSTRUCTION - CURRICULUM - ENVI

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 4

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
1927 Main Street
Green Bay, Wisconsin 54301
(414) 432-4338
(after Dec. 1, 1972 - 468-7464)

INSTRUCTION - CURRICULUM - ENVIRONMENT

ROGRAM FOR ENVIRONMENTAL EDUCATION

Mathematics GRADE 4

tle III E.S.E.A.

n CESA's 3-8-9

sin 54301

72 - 468-7464)

Robert Warpinski, Director
Robert Kellner, Asst. Director
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PREFACE

"Oikus" for house is the Greek origin of the term "ecology" studies our house--whatever or wherever it may be. Like an u expand or contract to fit many ranges--natural and man-made. environments, our many "houses" if we omit rancor and cite lo complexities. Our "oikus" uses the insights of all subjects. multidisciplinary program like ours necessarily results. Als a long time, our program ranges K thru 12. The environment m values. These values have their origin in the "oikus" of our minds. Let us become masters of our house by replacing the G with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide i to fit appropriately into existing, logical course content
2. Each page or episode offers suggestions. Knowing your stu to adapt or adopt. Limitless chances are here for your ex Many episodes are self contained, some open-minded, still developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no and no curriculum will work unless viewed in the context o
4. React to this guide with scratch ideas and notes on the ep
5. After using an episode, fill out the attached evaluation f duplicate, or request more of these forms. Send them sing We sincerely want your reactions or suggestions--negative evaluations are the key in telling us "what works" and in the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving al school districts in CESA 3, 8, and 9. Check the Project ICE resources. Our address and phone number is on this guide's c or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or proc

Affective refers to student attitudes, values, and feelings

PREFACE

is the Greek origin of the term "ecology". Environmental education whatever or wherever it may be. Like an umbrella, our house can to fit many ranges--natural and man-made. We can add quality to our any "houses" if we omit rancor and cite long range gains, costs, and "oikus" uses the insights of all subjects. Thus, a rational, positive, program like ours necessarily results. Also, since attitudes grow over ogram ranges K thru 12. The environment mirrors our attitudes or ies have their origin in the "oikus" of our collective and individual ome masters of our house by replacing the Greek adage of "Know thyself" and thine house."

igned by your fellow teachers, this guide is supplementary in nature-- ately into existing, logical course content.
isode offers suggestions. Knowing your students best, you decide what pt. Limitless chances are here for your experimentation and usage. re self contained, some open-minded, still others can be changed or a few days.
des, but please pre-plan. Why? Simply, no guide has all the answers, um will work unless viewed in the context of your students.
uide with scratch ideas and notes on the episode pages.
episode, fill out the attached evaluation form in the back. Use, request more of these forms. Send them singly or collectively to us. nt your reactions or suggestions--negative and positive. Your the key in telling us "what works" and in aiding our revisions of

LATIONS

ect ICE Resource Materials Center serving all public and non-public in CESA 3, 8, and 9. Check the Project ICE Bibliography of available ddress and phone number is on this guide's cover. Feel free to write y materials or help.
of Audio Visual Instruction, 1327 University Avenue, P. O. Box 2093, n 53701 (Phone: 608-262-1644).
a measurable mental skill, ability, or process based on factual data. s to student attitudes, values, and feelings.

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Robert Meyer, Neenah
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mentary Environmental Education Guides:

CESA #8

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liff Christensen, Winneconne
enneth Couillard, Hortonville
aymond Emerich, Hortonville
ike Ercegovac, Winneconne
ona Geeding, Menasha
onald Hale, Winneconne
ames Huss, Freedom
ister Lois Jonet, Holy Angels
enneth Kappell, St. Aloysius
enneth Keliher, Appleton
verett Klinzing, New London
red Krueger, Oshkosh
im Krueger, Winneconne
ae Rose LaPointe, St. John High
osemarie Lauer, Hortonville
obert Lee, Neenah
arold Lindhorst, St. Martin (L)
ennis Lord, Little Wolf
obert Meyer, Neenah
rnold Neuzil, Shiocton
ames Nuthals, Lourdes
onnie Peterson, St. Martin (L)
osemary Rafath, Clintonville
ark Reddel, St. Martin (L)
ladys Roland, Little Wolf
athryn Rowe, Appleton
ary Margaret Sauer, Menasha
dwin Schaefer, Kaukauna
ee Smoll, Little Chute
oris Stehr, Mt. Calvary (L)
inger Stuvetraa, Oshkosh
ichard Switzer, Little Chute
im Van Susteren, Holy Name
ila Wertsch, St. Margaret Mary
arren Wolf, Kimberly
ery Farrell, Menasha

CESA #9

Peter Biolo, West DePere
Lee Clasen, Lux.-Casco
Kathryn Colburn, Algoma
Merle Colburn, Algoma
Sara Curtis, Green Bay
Duane DeLorme, Green Bay
Roberta Dix, St. Joseph Acad.
Janet Elinger, Ashwaubenon
Phyllis Ellefson, Wash. Isle.
Keith Fawcett, West DePere
Jack Giachino, Seymour
Mike Gleffe, St. Matthews
Herbert Hardt, Gibraltar
Gary Heil, Denmark
Nannette Hoppe, How.-Suam.
Joseph Hucek, Pulaski
Catherine Huppert, DePere
DeAnna Johnson, Denmark
Kris Karpinen, West DePere
Mel Kasen, Gibraltar
Jack Koivisto, Green Bay
Sister Mary Alyce, Cathedral
Ellen Lotz, West DePere
Judilyn McGowan, Green Bay
Priscilla Mereness, Wrightstown
C. L. Paquet, Denmark
William Roberts, Sturgeon Bay
Roger Roznowski, Southern Door
Jan Serrahn, Sevastopol
Calvin Siegrist, How.-Suam.
Mary Smith, Green Bay
Carol Trimberger, Kewaunee
Mary Wadzinski, How.-Suam.

CONCEPT	Discipline Area	M su
1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes	Subject	Cha gy,
	Problem Orientation	osy
		ing

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN TIV
Cognitive: After collecting data on the highest daytime temperatures for given days from December through May and observing leaf growth of a tree, the student will write a paragraph explaining the sun's energy on plant growth. Affective: The student will orally defend the planting season of the area. Skills to be Learned 1. Thermometer reading 2. Observation and recording	I. Student-Centered in class activity A. The class will record temperatures at regular intervals to observe their effect on leaf growth of broadleaf tree. 1. Measure outside temperature and record daily on a chart from December to May. 2. Another team will write a monthly observation of the leaf growth of a broadleaf tree. 3. In May record the highest temperature for each month onto a chart. Compare this chart with the observation of leaf growth. 4. With group discussion make generalizations or the relationship between temperature and leaf growth. B. Extend the graph interpretations to cover the summer months. What does this indicate about the sun's energy on plant growth.

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sun, the basic

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osynthesis into a

ings can use for life processes

Discipline Area Mathematics

Subject Charts and Reading Charts

Problem Orientation Sun's Energy Grade 4

TIVES	SUGGESTED LEARNING EXPERIENCES	
ecting aytime n rough f para- sun's h. nt e e g cording	I. Student-Centered in class activity A. The class will record temperatures at regular intervals to observe their effect on leaf growth of broadleaf tree. 1. Measure outside temperature and record daily on a chart from December to May. 2. Another team will write a monthly observation of the leaf growth of a broadleaf tree. 3. In May record the highest temperature for each month onto a chart. Compare this chart witn the observation of leaf growth. 4. With group discussion make generalizations on the relationship between temperature and leaf growth. B. Extend the graph interpretations to cover the summer months. What does this indicate about the sun's energy on plant growth.	II. Outside Resource and Community Activities A. Record the atmospheric temperature for a week in early May. Go into a wooded area and record the temperature during the same week. At the end of May repeat the process. Is there a significant difference? What would this mean for the under growth in a forest?

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Condition Affecting Life Minnemast Unit 23 I-C-E RMC Mini-Climates Holt, Rinehart, Winston I-C-E RMC 120 Ma Ecology American Book Co. 300 Pike Street Cincinnati, Ohio Audio-Visual: Ecology and Man Series No. 1 McGraw Hill Energy Relationships St9 Set 1 I-C-E RMC Community: Astronomer or Planetarium guide to talk on the sun.	

ce Materials	Continued and Additional Suggested Learning Experiences
r Life -C-E RMC t, Rinehart, 0 Ma ok Co.	
es ergy t 1	

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CONCEPT	Discipline Area
2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.	Subject
	Problem Orientatio

BEHAVIORAL OBJECTIVES	SUGGESTED LEAR
Cognitive: The student will record the interaction of factors necessary to support the life of two animals Affective: The student will recognize that all living organisms are interrelated to each other. Skills to be Learned 1. Listing of Members of a set 2. Construction of Venn Diagrams to find intersection 3. Discerning an intersection of a set 4. Listing an intersection	I. Student-Centered in class activity A. Have either actual animals or A.V. materials presenting animal habitats available. Students are to take two animals and list the factors necessary for the life of each. 1. Construct Venn Diagrams and place the information for each animal into the circles 2. List a. Union of the sets b. Intersection of the sets c. Subsets B. The students may repeat the process using different animals. C. Compare the intersections and find how animals relate and how the interrelation forms ecosystems.

anisms interact	Discipline Area	Mathematics	
and their environ-	Subject	Sets	
ntricate unit	Problem Orientation	Ecosystem	Grade 4
em.			

CTIVES	SUGGESTED LEARNING EXPERIENCES	
nt r- ces- life	I. Student-Centered in class activity A. Have either actual animals or A.V. materials presenting animal habitats available. Students are to take two animals and list the factors necessary for the life of each. 1. Construct Venn Diagrams and place the information for each animal into the circles 2. List a. Union of the sets b. Intersection of the sets c. Subsets B. The students may repeat the process using different animals. C. Compare the intersections and find how animals relate and how the interrelation forms ecosystems.	II. Outside Resource and Community Activities A. Take a field trip and construct Venn Diagrams to illustrate actual ecosystem interrelations B. Catch an actual insect or small animal and create an ecosystem that will support him. C. Invite a park or recreational facility planner who can share with the students ideas and factors which go into the planning of a park or recreational area. D. Simulate the planning of a zoo facility.
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Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: Ecology: Web of Life Series: Benziger, 866 Third Avenue New York, New York, I-C-E RMC 130 Mc10 Ecology American Book at I-C-E Subarsky, Zachariah Living Things in Field and Classroom, Minnesota Mathematics and Science Teaching Project Ecolab Johnson and Mann Benefic Press Available at I-C-E K: 21 RMC Audio-Visual: Ecological Systems : Imperial Film Co. 4 filmstrips World of Animals available at I-C-E RMC Interrelationships of Plants and Animals SVE ROA Films, Milwaukee Urban Ecology: Six Microsystems (Filmstrip) I-C-E RMC Ecology and Man Series No. 2 McGraw Hill available at I-C-E RMC Nature's Half Acre Film N-210 I-C-E RMC Pond Life BAVI $2.25 Community:	

ind	terials	Continued and Additional Suggested Learning Experiences
	es: e E d	
	Items 2 -C-E 210	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT		
3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.	Discipline Area Mathematics Subject 2,3,4 Digit Mul Problem Orientation Limitation	tors gani ce, ryi

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENC	ES
Cognitive: The students will be able to calculate by multiplication the number of organisms destroyed by the construction of housing or industrial projects. Affective: The student will contribute to sustaining the life of a living organism. Skills to be Learned 1. Measuring off square yards 2. Plant Identification 3. Multiplication of 2,3,4 digit numbrals 4. Recording Data	I. Student-Centered in class activity A. You will count organisms in an open field. 1. Measure off a square foot in an open field. Count the number of each kind of organism within the square yard. 2. Record on a chart. B. Consult an industrial planner or construction worker to find the size of a given housing project industrial plant. 1. Then multiply the size by the number of organisms per square foot. 2. Record these results on the chart. C. Discuss the effects of the plant and animal loss on the total environment. D. Propose a plan to replace the lost plants and animals.	II. Outsid Communi A. Compar of organi field and industrial factors. B. If the project i to illust

:ors are limiting
ganisms living
:e, thus, each
:rying capacity.

Discipline Area Mathematics

Subject 2,3,4 Digit Multiplication

Problem Orientation Limitation of organisms Grade 4

VES	SUGGESTED LEARNING EXPERIENCES	
:e im- ed ous- :ts.	I. Student-Centered in class activity A. You will count organisms in an open field. 1. Measure off a square foot in an open field. Count the number of each kind of organism within the square yard. 2. Record on a chart. B. Consult an industrial planner or construction worker to find the size of a given housing project industrial plant. 1. Then multiply the size by the number of organisms per square foot. 2. Record these results on the chart. C. Discuss the effects of the plant and animal loss on the total environment. D. Propose a plan to replace the lost plants and animals.	II. Outside Resource and Community Activities A. Compare and classify the kinds of organisms found within an open field and in a residential and/or industrial area. List limiting factors. B. If there is a development project in the area - take pictures to illustrate before and after.

Resource and Reference Materials	Continued and Additional Suggested Learnin
Publications: Community Planning Handbook 100 Gi at I-C-E RMC Living Things in Field and Classroom 110 Subarsky at I-C-E RMC Mini-climates Holt, Rinehart and Winston 120 Ma at I-C-E RMC	
Audio-Visual: Ecology and Man Series No. 3 McGraw Hill at I-C-E RMC St 9 No Room for Wilderness BAVI $11.00 Man Uses and Changes the Land BAVI $4.00 The Ecological Crisis Evolution and Extinction K 14 I-C-E RMC	
Community: Agricultural or County Agent.	

aterials	Continued and Additional Suggested Learning Experiences
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CONCEPT	Discipline Area	Mathematics
4. An adequate supply of pure water is essential for life.	Subject	Measurement and
	Problem Orientation	Pure Water Su

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Cognitive: The student will identify the relationship between the diameter of a hose and the quantity of water that can pass through it. Affective: The student is conscious of the limited water supply and selects a hose in accordance with the quantity needed. Skills to be Learned 1. Linear Measurement 2. Liquid Measurement 3. Collecting data and making a chart 4. Graphing data	I. Student-Centered in class activity A. You will work with various hose sizes. 1. Measure the diameter of the hoses and label. 2. Attach the hose to a tap and allow water to flow (turned on full) for 10 seconds into a pail. Use a stop watch or second hand to assure exact timing. 3. Measure the amount of water collected and record. 4. Repeat the process for each hose size. 5. Chart your information. 6. Graph the information. B. If you collect water for 20 seconds from each does the amount double? Test your answer by measurement.	II. Outside [illegible] Community A. Examine [illegible] pipes as pos[illegible] giving the [illegible] thickness o[illegible] purpose for [illegible] Discuss pipe[illegible] ber. B. Figure th[illegible] usage for th[illegible] using the ra[illegible] Or use the s[illegible] cipality gi[illegible] 1st 500 cu. [illegible] next 9,500 over 10,000 Service Charg[illegible] Minimum Mont[illegible]

upply of pure

al for life.

Discipline Area Mathematics

Subject Measurement and timing

Problem Orientation Pure Water Supply Grade 4

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SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. You will work with various hose sizes.

1. Measure the diameter of the hoses and label.
2. Attach the hose to a tap and allow water to flow (turned on full) for 10 seconds into a pail. Use a stop watch or second hand to assure exact timing.
3. Measure the amount of water collected and record.
4. Repeat the process for each hose size.
5. Chart your information.
6. Graph the information.

B. If you collect water for 20 seconds from each does the amount double? Test your answer by measurement.

II. Outside Resource and Community Activities

A. Examine and measure as many pipes as possible. Make a chart giving the inside diameter, thickness of wall, material, and purpose for each pipe.

Discuss pipe sizes with a plumber.

B. Figure the cost of water usage for the school or a home using the rates from the area. Or use the scale from a municipality given here:

	Cost per 100 cu. ft.
1st 50 cu. ft.	36¢
next 9, 0	18¢
over 10,000	12¢
Service Charge	60¢

Minimum Monthly charge $1.10

Resource and Reference Materials	Continued and Additional Suggested Learning Exp
Publications: Ecolab - Johnson and Mann Benefic Press I-C-E RMC Kit 21 Running Water Stecher, Wentworth Holt, Rinehart and Winston I-C-E RMC120 Na 5 Water Life Science Library Leopold and Davis New York Time Inc. Audio-Visual: Water for Tomorrow KDI Instructional Systems 1870 MacKenzie Drive Columbus, Ohio $29.00 K 5 Aggradation and Degradation Merrimac River I-C-E RMC City Water Supply BAVI $2.00 Water BAVI $2.00 Water Pollution BAVI FS St I Woods Educational Filmstrips (Marine Pollution Freshwater Pollution) Community: Plumber Health Inspector to speak on water quality	

e Materials	Continued and Additional Suggested Learning Experiences
ann Benefic 21 , Wentworth ston rary 1870 egra-	
nal lution eak	

CONCEPT	Discipline Area	Subject	Problem Orientation
5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.	Mathematics	Computation o of money	Air can pollute

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENC	
Cognitive: The student will compute and compare cost of air pollution for a given person in the U.S. Affective: The student will develop a consciousness of the cost of air pollution and write a letter of concern to a local polluter. skills to be Learned 1. Idea of estimation 2. Addition and subtraction of Money 3. Problem solving 4. graphs	I. Student-Centered in class activity A. Give the students the fact sheet of costs per person for air pollution. 1. Build an investigation sheet using the statistics. B. Discuss factors that might introduce variations to the cost per person.	II. Outside Communi A. Using f from an ex Then try t residue is B. Examine a furnace. filter in a Make genera dust in the filters.

:uate supply of clean air is
lecause most organisms
oxygen, through respira-
:elease the energy in their food.

Discipline Area Mathematics

Subject Computation of money and graphing of money

Problem Orientation Air can be polluted

Grade 4

AL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
e student and compare llution for in the U.S. e student conscious- st of air write a ern to a . earned imation d subtrac- ving	I. Student-Centered in class activity A. Give the students the fact sheet of costs per person for air pollution. 1. Build an investigation sheet using the statistics. B. Discuss factors that might introduce variations to the cost per person.	II. Outside Resource and Community Activities A. Using filter paper, trap air from an exhaust pipe of a car. Then try to find out what the residue is made of. B. Examine the air filter from a furnace. If possible check the filter in a week and a month. Make generalizations on the dust in the air and the need for filters.

Resource and Reference Materials	Continued and Additional Suggested Learning

Publications:

Man's Control of the Environment
100 Ma I-C-E RMC
Needed Clear Air pamphlet from
EPA 1 North Wacker Drive
Chicago, Illinois, 60606
Smog Simulation Game at I-C-E
RMC sgl
Air Pollution
National Air Pollution Control
5600 Fishers Lane
Rockville, Maryland 20852

Audio-Visual:

Ecology and Man Series no. 3
McGraw Hill at I-C-E RMC
America's Urban Crisis
(Air Pollution Menace)
K-13 at I-C-E RMC
FS St I Ward's Educational
Filmstrips (Atmospheric Control)
Air and Water Pollution
Scott Educational Division
Transparency Set 45¢
Box 391
Holyoke, Mass. 01040

Community:

Statistics from a factory
in the area on the cost
of air pollution.

Statistics to include on estimated cost of a
per person:

Farming Loss	$2.50
Human Health	2.00
Cleaning	2.00
Clothing Replacement	2.50
Soiling and Deterioration	3.00
Corrosion	2.50
Maintenance	2.00
Property Devaluation	1.00

1. What is the total cost per person?
2. How much would air pollution cost if you
for 6 years and had to keep it looking good?
3. If you were a parent of 3 children, how m
your children lose on clothing in 1 year.
4. A farmer loses how much on corrosion of a
used for 10 years.
5. Soil deterioration costs how much more th

Put this onto a simple bar graph to compare

cost	50¢	$1.00	$1.50	$2.00	$2.50	$3.
Farming						
Health						
Cleaning						

erials	Continued and Additional Suggested Learning Experiences
onment	Statistics to include on estimated cost of air pollution per person:
from	Farming Loss $2.50 Human Health 2.00 Cleaning 2.00 Clothing Replacement 2.50 Soiling and Deterioration 3.00 Corrosion 2.50 Maintenance 2.00 Property Devaluation 1.00
-E	
rol	
3	1. What is the total cost per person? 2. How much would air pollution cost if you owned a house for 6 years and had to keep it looking good? 3. If you were a parent of 3 children, how much would your children lose on clothing in 1 year. 4. A farmer loses how much on corrosion of a plow if it is used for 10 years. 5. Soil deterioration costs how much more than health?
	Put this onto a simple bar graph to compare the cost
	cost 50¢ $1.00 $1.50 $2.00 $2.50 $3.00 Farming Health Cleaning

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CONCEPT	Discipline Area	Subject	Problem Orientation
6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.	Mathematics	Sets - Unio	Mineral

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIEN	
Cognitive: Given a set of valuable mineral resources for two states, the students will list the union and intersection. Affective: The student will develop a consciousness of the distribution of mineral resources. Skills to be Learned Tabulation of union of sets Tabulation of Intersection of sets Empty sets Subsets Use of Venn Diagrams	I. Student-Centered in class activity A. Give the students the list of mineral resources on reverse side. B. After the worksheet is finished discuss the need for cooperation. C. Find the intersection and compare the area characteristics. D. You can do a similar process using rainfall statistics.	II. Outsi Commu A. Go to tural re area. 1. Find amount. 2. Comp state p

resources are not equally	Discipline Area	Mathematics
cver the earth or over	Subject	Sets - Union - Intersection
eatly affect the geographic	Problem Orientation	Mineral Resources Grade 4
and quality of life.		

RAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
n a set eral wo states, ll list the section. student conscious- tribution of es. arned nion of ntersection grams	I. Student-Centered in class activity A. Give the students the list of mineral resources on reverse side. B. After the worksheet is finished discuss the need for cooperation. C. Find the intersection and compare the area characteristics. D. You can do a similar process using rainfall statistics.	II. Outside Resource and Community Activities A. Go to the site of a natural resource processing a area. 1. Find out the production amount. 2. Compare this to other state production amounts.

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications:	List of Mineral Resources
Investigating Man's World Regional Studies Scott Foresman I-C-E RMC	Wisconsin — Sand, gravel, stone,
World Resources Ginn and Co. 940 Sa at I-C-E RMC	Illinois — Coal, Petroleum, ston
From Sea to Shining Sea Report on the American Environment Washington D.C. at I-C-E RMC	Indiana — coal, cement, stone,
	Iowa — cement, stone, sand,
	Michigan — Iron ore, cement, cop
	Kansas — Petroleum, natural ga liquids,
Audio-Visual:	Ohio — coal, stone, lime, ce
"Our Natural Resources" color 11 min. BAVI	South Dakota — gold, sand, gravel, s
"Man Uses and Changes the Land" BAVI	Use Venn Diagrams Tabulate the intersection and union.
K 28 "Saving What's Left" (Utilizing our Resources Adding to our Resources) I-C-E RMC	1. Wisconsin and Illinois 2. Wisconsin and Michigan 3. Kansas and South Dakota
	Tabulate intersection and union
Community:	1. Wisconsin and South Dakota 2. Wisconsin and Ohio 3. Wisconsin and Iowa 4. Wisconsin and Indiana 5. Wisconsin and Kansas
The owner of a gravel pit or sand pit DNR representative	

Continued and Additional Suggested Learning Experiences

List of Mineral Resources

Wisconsin	Sand, gravel, stone, cement, zinc
Illinois	Coal, Petroleum, stone, sand gravel
Indiana	coal, cement, stone, petroleum
Iowa	cement, stone, sand, gravel, gypsum
Michigan	Iron ore, cement, copper, sand, gravel
Kansas	Petroleum, natural gas, helium, natural gas liquids,
Ohio	coal, stone, lime, cement
South Dakota	gold, sand, gravel, stone cement,

Use Venn Diagrams
Tabulate the intersection and union.

1. Wisconsin and Illinois
2. Wisconsin and Michigan
3. Kansas and South Dakota

Tabulate intersection and union

1. Wisconsin and South Dakota
2. Wisconsin and Ohio
3. Wisconsin and Iowa
4. Wisconsin and Indiana
5. Wisconsin and Kansas

CONCEPT 7. Factors such as facilatating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.

Discipline Area Mathemati[illegible]

Subject Computati[illegible]

Problem Orientation Populat[illegible]

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCE	[illegible]
Cognitive: The student will construct and compare population tables showing U.S. city and rural population in census years since 1900. Affective: The student will develop and defend his position on the dangerous effects of increasing population on land use and population density. Skills to be Learned Collecting Data Organizing Constructing Tables Subtraction Graphing Making Judgements	I. Student-Centered in class activity A. Collect data from the Almanac or encyclopedia on urban and rural populations since 1900 (Use the figures from each census. 1. Make tables of the facts. 2. Find the difference between rural and urban populations for each census. Then graph the difference. B. Discuss continuing increase of population on 1. Land use 2. City growth 3. Resource usage	II. Ou[illegible] Co[illegible] A. In[illegible] planne[illegible] of res[illegible] 10 yea[illegible] B. Usi[illegible] Graph [illegible] parks. C. Usi[illegible] acreag[illegible] Popula[illegible] 1960 [illegible] 62 64 66 68 70 71 Cro[illegible] 500,00[illegible] 420,00[illegible] 250,00[illegible] 250,00[illegible] 420,00[illegible] 160,00[illegible]

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land use and centers of population density.

Discipline Area Mathematics

Subject Computation and graphing

Problem Orientation Population shift Grade 4

TIVES	SUGGESTED LEARNING EXPERIENCES	
dent d com- ables and in e 1900. udent de- on ects ula- and y. ned s	I. Student-Centered in class activity A. Collect data from the Almanac or encyclopedia on urban and rural populations since 1900 (Use the figures from each census. 1. Make tables of the facts. 2. Find the difference between rural and urban populations for each census. Then graph the difference. B. Discuss continuing increase of population on 1. Land use 2. City growth 3. Resource usage	II. Outside Resource and Communtiy Activities A. Invite an assessor or City planner who can show the expansion of residential area over the past 10 years. Map out this change. B. Using data from EQ Index. Graph the pressures on national parks. C. Using the EQ Index graph the acreage of cropland that is lost. Population data 1960 to 1970 Millions of people 62 90 64 120 66 150 68 160 70 180 71 200 Cropland 500,000 acres More Parks 420,000 " Flood control 250,000 " Wildlife refuge 250,000 " Recreational area 420,000 " Urban development 160,000 " Airport & Highways

Resource and Reference Materials	Continued and Additional Suggested Learning Exp
Publications: Mini-Climates - at I-C-E 120 Ma 1971 EQ Index - National Wild-life Magazine I-C-E RMC V.F. Ecology the City Benziger I-C-E RMC 130 Ma 10 "Man's Control of the Environ-ment" Congressional Quarterly I-C-E RMC 100 Ma Audio-Visual: The Ecological Crisis SVE K-13 at I-C-E RMC Population Explosion part 5. New York Times I-C-E RMC 3849 Expanding City 15 min. $2.00 BAVI Kit 13 America's Urban Crisis (The Housing crisis - The Transpor-tation Crisis) Community: Local Realator Assessor Sanitary Department Official	

Continued and Additional Suggested Learning Experiences

CONCEPT	Discipline Area	Subject	Problem Orientation
8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.	Mathema	Comparis	Acti env

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	IVE
Cognitive: Given a questionaire, the learner will collect and compare data on the use of environment for recreation. Affective: The student will support positive use of the environment for recreation. Skills to be Learned Recording data on a Comparison by subtraction Generalizing from data	I. Student-Centered in class activity A. You will survey use of recreational facilities 1. Prepare and distribute a questionaire on use of the environment for recreation. (sample on reverse side) 2. Put the data onto the table. 3. Find the difference between the positive and negative response for each age group. 4. Find the difference between age group responses to the questions. 5. Using the data and the figures from subtraction, write a summary statement on the change in attitude and use of environment for for recreational purposes.	II. O C A. P picn to a B. Ha and neari C. Us cost fami D. Fi being your parks

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:onomic, social,	Discipline Area	Mathematics
:actors determine	Subject	Comparison by Subtraction
: values and attitudes	Problem Orientation	Attitude toward environment — Grade 4
:ronment.		

:IVES	SUGGESTED LEAPNING EXPERIENCES	
a learner ompare envir- ion.	I. Student-Centered in class activity A. You will survey use of recreational facilities 1. Prepare and distribute a questionaire on use of the environment for recreation. (sample on reverse side) 2. Put the data onto the table. 3. Find the difference between the positive and negative response for each age group. 4. Find the difference between age group responses to the questions. 5. Using the data and the figures from subtraction, write a summary statement on the change in attitude and use of environment for for recreational purposes.	II. Outside Resource and Community Activities A. Plan the food needed for a picnic lunch for the class and go to a nearby wayside or park. B. Have a person from the Park and Recreation Commission of a nearby city speak to the class. C. Using a catalog calculate the cost of camping equipment for a family of 5. D. Find out the amount of money being spent on local parks in your area, state parks, national parks.
dent ive ment		
ed a		

Resource and Reference Materials

Publications:

E Q IndeX from I-C-E RMC

V.F.
The Environmental School
120 Me from I-C-E RMC
Camp Recreation - Wausau
I-C-E RMC
The Best Nature Writing
of Joseph Wood Krutch
I-C-E RMC
Biennel Report of DNR
I-C-E RMC V.F.
Door County Natural Beauty
Summary Report I-C-E RMC

Audio-Visual:

K. No. 5 Aggradation Degradation I-C-E RMC
Nature is for People BAVI
National Parks BAVI
Adventuring in Conservation
BAVI
Camp Happiness BAVI

Community:

Park Director
DNR Person
Game Warden
Campsite Director

Continued and Additional Suggested Learning E

QUESTIONAIRE
(Age grouping - Circle one over 50, 49-16,
1. Does your family own a camper, tent, or co
2. Have you been to a state park? YES NO
3. Do you go to parks and waysides in your ar
4. Does your family go swimming or to the bea
5. Have you flown a kite? YES NO
6. Would you contribute $10.00 to the buildin
   YES NO
7. Do you go fishing or hunting? YES NO

DATA SHEET

AGE	Under 15		49-16		
Question	Number Yes	Number No	Number Yes	Number No	
No. 1					
No. 2					
No. 3					
No. 4					
No. 5					
No. 6					
No. 7					

QUESTIONAIRE

(Age grouping - Circle one over 50, 49-16, under 15

1. Does your family own a camper, tent, or cottage? YES NO
2. Have you been to a state park? YES NO
3. Do you go to parks and waysides in your area? YES NO
4. Does your family go swimming or to the beach? YES NO
5. Have you flown a kite? YES NO
6. Would you contribute $10.00 to the building of a new park? YES NO
7. Do you go fishing or hunting? YES NO

DATA SHEET

AGE	Under 15		49-16		Over 50	
Question	Number Yes	Number No	Number Yes	Number No	Number Yes	Number No
No. 1						
No. 2						
No. 3						
No. 4						
No. 5						
No. 6						
No. 7						

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT	Discipline Area	Subject	Problem Orientation
9. Man has the ability to manage, manipulate, and change his environment.	Mathe	Meas	Ma

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	OBJ
Cognitive: The students will be able to measure cups, and centimeters and be able to read a meter stick. Affective: The students will realize that man has the ability to change a plant's ability to grow through the use of plant food and fertilizer. Skills to be Learned 1. Reading a meter stick 2. Measuring 3. Recording	I. Student-Centered in class Activity A. You will work with soils. 1. Fill three boxes with a low quality dirt containing gravel, clay, etc. 2. Germinate bean seeds and plant them in the boxes. 3. Obtain a quality water soluble fertilizer and plant food. Box # 1 mix half the recommended dosage in 1 cup of water, for Box # 2 mix the full recommended dosage in 1 cup of water for the plant. For Box # 3 water the plant with water only. 4. The students must carefully measure and record the water and plant for the boxes. 5. As the plants grow, have the students measure the plants progressive gain in height(every two days) in centimeters and record it. 6. Compare the gains in height in the boxes receiving plant food. Graph the results of each box so progress can be observed.	II. he s to tim to r A. tl an B. an on The tha to c ty t use ili Lea mete

s the ability to manage,

e, and change his environ-

Discipline Area Mathematics

Subject Measurement and Graphing

Problem Orientation Manipulation Grade 4

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
he students to measure ntimeters to read a meter	I. Student-Centered in class Activity A. You will work with soils. 1. Fill three boxes with a low quality dirt containing gravel, clay, etc. 2. Germinate bean seeds and plant them in the boxes. 3. Obtain a quality water soluble fertilizer and plant food. Box # 1 mix half the recommended dosage in 1 cup of water, for Box # 2 mix the full recommended dosage in 1 cup of water for the plant. For Box # 3 water the plant with water only. 4. The students must carefully measure and record the water and plant for the boxes. 5. As the plants grow, have the students measure the plants progressive gain in height(every two days) in centimeters and record it. 6. Compare the gains in height in the boxes receiving plant food. Graph the results of each box so progress can be observed.	II. Outside Resource and Community Activities A. Invite a farmer to talk about the use of chemical fertilizer and insecticide. B. Agent can talk to the students and offer statistics and facts on the influence of fertilizer.
The students that man has to change a ty to grow use of plant tilizer.		
Learned meter stick		

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: Thomas William L. (ed) Man's Role in Changing the Face of the Earth Chicago Press 1956 Environmental Science Center Nov. 1970 "Ecology - A handbook for Environmental Action - What can I do?" Ecology: The Farm Benziger I-C-E RMC 130 Mc Audio-Visual: "Discovering Life Around Us: A Visit to the Farm" Encyclopedia Britannica Films Rental and Purchase Library 425 North Michigan Avenue Chicago, Illinois 60611 "Ecological Imbalances" FS St 2 at I-C-E RMC Community: Consult with a farmer on problems of his field areas and learn his recommendations. Visit a greenhouse. Get a gardeners views on soil requirements. (or successful gardeners in the area.	

ng	Continued and Additional Suggested Learning Experiences
e h	

ESEA Title III - 59-70-0135 -2 Project I-C-E

CONCEPT	Discipline Area	Mathematics
10. Short-term economic gains may produce long-term environmental losses.	Subject ---	Problem Solving
	Problem Orientation	Short and Long tors

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Cognitive: The student will be able to compare the supply and demand of timber consumption in the United States Yearly. Affective: The student will realize, that without proper planning and use of timber resources the supply will soon be depleted. Skills to be Learned 1. Problem Solving 2. Critical Analysis 3. Discussion Groups	I. Student-Centered in class activity A. President Nixon's policy on housing. Five year goal of 3 million new housing units annually requiring 60% more timber and 7 billion board feet more annually from national forest. *(Teacher Discussion Question) Can this be done and still maintain a policy of multiple use and sustained yield? Or will the urgent need for timber clash with other environmental values - wild life , recreation and watershed protection. Problems: 1. Need 18.8 billion cu.ft. growth 16.6 cu. ft. shortage How many billion cu. ft.? 2. The average person now uses 560 lbs. of paper a year. In 2000 A.D. each person will need 1000 lbs. of paper per year. What is the increase of each person's needs. (continued on reverse side)	II. Outside Re Community A. Invite a r local papermi class about h timber that i in making pap est from whic of trees are for paper pro B. Have a mem of Natural Re classroom. Di woodland asse states potent products outp

rm economic gains may

-term environmental

Discipline Area Mathematics

Subject Problem Solving

Problem Orientation Short and Long term factors Grade 4

S	BJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Re y r mi h i ap ic e ro em Re Di se nt tp	tudent compare emand of on in the arly. student at with- ing and sources soon be rned ng ysis oups	I. Student-Centered in class activity A. President Nixon's policy on housing. Five year goal of 3 million new housing units annually requiring 60% more timber and 7 billion board feet more annually from national forest. *(Teacher Discussion Question) Can this be done and still maintain a policy of multiple use and sustained yield? Or will the urgent need for timber clash with other environmental values - wild life , recreation and watershed protection. Problems: 1. Need 18.8 billion cu.ft. growth 16.6 cu. ft. shortage How many billion cu. ft.? 2. The average person now uses 560 lbs. of paper a year. In 2000 A.D. each person will need 1000 lbs. of paper per year. What is the increase of each person's needs. (continued on reverse side)	II. Outside Resource and Community Activities A. Invite a representative of a local papermill to talk to the class about how they select the timber that is cut for their use in making paper. Where is the forest from which they cut? What kind of trees are most commonly used for paper products? B. Have a member of the Department of Natural Resources visit your classroom. Discuss your areas woodland assests. Discuss the states potential and annual wood products output.

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: Poster: "If we don't preserve this Natural Beauty. Life will become a Dead Issue." Mem Co. , P.O. Box 273, New York 10046 $1.00 17" X 22" Color Poster Eagle over wooded mountain range. Audio-Visual: "Ecological Systems" Imperial Film Co., 321 S. Florida Ave. Lakeland, Florida 33803 $36.00 Forest Biome etc. 4 film strips 2 records "Fallin Northern Wisconsin"11 min. BAVI 1696 "Place to Live" $3.00 1941 BAVI 18 min. Fs St2 "Ecological Imbalance" I-C-E RMC Community: Housing Construction Projects Barn Construction in rural area School supply room. Office supply rooms local companies (to note paper needs)	I. continued *Discussion 3.2 million acres burn eve we prevent this waste? 3. It takes 12,000 board feet to build o board feet will it take to build 3 milli

e Materials	Continued and Additional Suggested Learning Experiences
preserve Life will 3, New Poster ntain Imperial da Ave. 03 $36.00 ilm strips onsin"11 min. $3.0 balance" Projects rural area ote paper	I. continued *<u>Discussion</u> 3.2 million acres burn every year. How can we prevent this waste? 3. It takes 12,000 board feet to build one house. How many board feet will it take to build 3 million houses?

ESEA Title III - 59-70-0135 -2 Project I-E-E

CONCEPT	Discipline Area	Subject	Problem Orientation
11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.	Mathematics	Numeration (Addition	Waste Disposal

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Cognitive: The child will compute by addition the weight of classroom paper owned by all students which, ultimately will be disposed of as waste. Affective: The student will criticize amount of paper consumed by himself and peers and respond to the value of economy in keeping waste down. Skills to be Learned Planning Observation Collecting Organizing Computation Criticizing	I. Student-Centered in class activity A. The class will weigh the amount of paper (notebooks/ looseleaf) they have in their desks. This amount will be added to the amount in other classes and a total weight in pounds determined for the entire school. 1. This can be done by rows, having each child add the weight of his paper to his neighbor's. 2. The amount in total for each row can then be added to the sum of other rows. B. The class will endeavor to research the relationship between pounds of paper and amount of trees. C. Then calculate the actual wasting of paper per room. Work to find the number of trees destroyed by waste. D. After a week of concerted effort and participation again calcualte the waste. See in (continued on reverse side)	II. Outside Reso Community Ac A. Invite repre local paper com class as to the new paper in ch value of waste B. Invite repre waste disposal with class the up and disposin C. If recycling the area - supp an hour on Satu ing in collecti of newspaper or

uplicated or

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Discipline Area Mathematics

Subject Numeration (Addition)

Problem Orientation Waste Disposal Grade 4

SUGGESTED LEARNING EXPERIENCES

. Student-Centered in class activity

A. The class will weigh the amount of paper (notebooks/ looseleaf) they have in their desks. This amount will be added to the amount in other classes and a total weight in pounds determined for the entire school.

1. This can be done by rows, having each child add the weight of his paper to his neighbors.
2. The amount in total for each row can then be added to the sum of other rows.

B. The class will endeavor to research the relationship between pounds of paper and amount of trees.

C. Then calculate the actual wasting of paper per room. Work to find the number of trees destroyed by waste.

D. After a week of concerted effort and participation again calcualte the waste. See in

(continued on reverse side)

II. Outside Resource and Community Activities

A. Invite representative from local paper company to inform class as to the value per pound new paper in child's desk and value of waste paper.

B. Invite representative from waste disposal plant to discuss with class the cost of picking up and disposing of waste paper.

C. If recycling is going on in the area - support it by working an hour on Saturdays or by helping in collection and bailing of newspaper or other materials.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: America's Natural Resources Callison, Charles H. 1967 Future Environments of North America Darling, F. & Milton, John P. Trees and Forests Jepson, Stanley M. Audio-Visual: "Conservation of Our Forests" (film strip) EYE Gate House, Inc. 432 Park Ave. New York Aggradation/Degradation Kt 5 "Ecological Imbalance" Fs St 2 at I-C-E RMC Community: Paper Mill Representative County Forester Waste Disposal Plant Representative	I. continued D. recycling if the number of t decreased. E. Try schemes in classroom to record of what it might amount

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ence Materials	Continued and Additional Suggested Learning Experiences
Resources H. 1967 s of North F. & Milton, Jepson, Stanley ur Forests" c. York ation nce" Fs ntative nt Re-	I. continued D. recycling if the number of trees destroyed by waste has decreased. E. Try schemes in classroom to actually save paper - keep record of what it might amount to in a month's time.

CONCEPT	Discipline Area	Subject	Problem Orientation
12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.	Mathematics	Money value	Stewards

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	IVES
Cognitive: Given a simulation game on recycling resources the student will act as an individual company and deal with the problems of production, consumption and pollution. Affective: The student will recognize the need for cooperative action in order to solve pollution and be willing to sacrifice some monetary gain for that goal. Skills to be Learned Decision Making Critical thinking Addition and subtraction of money	I. Student-Centered in class activity Use Recycling Resources A. Prepare the students by using Solid waste pollutants (Filmstrip from URBAN CRISIS K-13 at I-C-E B. Use the recycling resources Simulation Game (available from I-C-E RMC) C. 1. Discuss the results and the kinds of decisions that had to be made. 2. Discuss the results of one person's pollution and its effects on the entire group.	II. Outs sim Comm cli A. Visi ent or have al speak t the B. Try tion money b lut maintena vironme project der Then co nee decreas tion creasin luti sacr gai

ership must be re-

wardship and should

on or violate the

of others.

Discipline Area Mathematics

Subject Money value

Problem Orientation Stewardship Grade 4

IVES	SUGGESTED LEARNING EXPERIENCES	
simu- cling ent will ual com- the tion, llution. ident need tion in lution sacri- gain ed action	I. Student-Centered in class activity Use Recycling Resources A. Prepare the students by using Solid waste pollutants (Filmstrip from URBAN CRISIS K-13 at I-C-E B. Use the recycling resources Simulation Game (available from I-C-E RMC) C. 1. Discuss the results and the kinds of decisions that had to be made. 2. Discuss the results of one person's pollution and its effects on the entire group.	II. Outside Resource and Community Activities A. Visit a waste treatment plant or have the director of a plant speak to the students. B. Try to compile the amount of money being put into creation and maintenance of recycling or environmental quality improvement projects within the local area. Then compare the increase or decrease to the need and the increasing awareness of decadence.

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: "Investigating Man's World" Metropolitan Studies Unit 4 Scott Foresman, Economics Unit 5 "The Social Sciences" Harcourt Stone, A New Ethic for a New Earth Friendship Press New York $1.95	
Audio-Visual: "Recycling Resources" Continental Can Co. Simulation game available at I-C-E Sg 6 Set I "America's Urban Crisis" Group 1 . E K-13 available at I-C-E RMC "Ecological Crisis" K-14 SVE I-C-E RMC	
Community: Manufacturing Areas observing industrial complexes and waste piles, Observe garbage dumps and effect on the environment. Observe barns and yards.	

terials	Continued and Additional Suggested Learning Experiences
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PROJECT I-C-E Episode Evaluation Form (Reproduce or duplicate as nee

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode used in your class, form. Feel free to adapt it and add more pages. Le your critiques and comments - negative and positive. hand column, please rate (poor, good, excellent) eac make specific comments or suggestions if possible in vided to help us make this a more usable guide. Tha

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

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CT I-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

. Behavioral Objectives
A. Cognitive:

B. Affective:

. Skills Developed

. Suggested Learning Experiences
A. In Class:

B. Outside & Community Activities:

. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 8-8-9
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