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ABSTRACT

This series of five environmental education units is designed for use in grades 1-5. The units are designed around the concepts of survival, interdependence, scarcity, recyclement, rights vs. responsibility, planning, valuing, social forces, and optimism. Each unit is further developed around environmental generalizations (subconcepts), objectives, activities and strategies, materials, and expected outcomes. The grade 1 unit is designed to give the child a variety of sensory and intellectual experiences. The purpose of the grade 2 unit is to expand the student's idea of his environment. The grade 3 unit focuses on air and the use of the senses to explore air. The grade 4 unit utilizes an interdisciplinary approach to explore water and the water environments. The grade 5 unit is concerned with the wisest multiple use of renewable resources and encourages the child into a commitment and involvement. Appendixes are included for each unit. (TK)

4621

EAST SYRACUSE-MINOA SCHOOLS

Environmental Education Materials

Elementary Package

(1) Grade One
(2) Grade Two
(3) Grade Three
(4) Grade Four
(5) Grade Five

Produced Under USOE Grant OEG-0-71-4621
by East Syracuse-Minoa Central Schools
407 Fremont Road
East Syracuse, N.Y. 13057
Dr. Fritz Hess, Superintendent

EAST SYRACUSE-MINOA SCHOOLS

Environmental Education Materials

Elementary Unit

Grade One

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Flowchart of Concepts	Grade One	Grade Two	Grade Three	Grade Four	Grade Five
Survival-continuing life (or existence) in the presence of difficult conditions...survival depends upon the ability of an organism to adjust to its environment.	X				
Interdependence-mutual reliance...an organism cannot live alone.	X	X	X	X	X
Scarcity-smallness of quantity in relation to needs...as populations increase, the competition for resources necessitates the establishment of priorities.		X	X	X	X
Recyclement-continuous feedback for reuse... man would do well to observe nature's example and reuse the results of his technology.					X
Right vs. Responsibility-satisfying the requirements of suitability or convenience vs. accountability...man has exercised his right with little regard for his responsibility to the environment.					X
Planning-detailing a program of action... decisions concerning the future must be based on long-term environmental benefits.		X			X
Valuing-assessing relative worth or importance ...man is endangering his chances for a better life through the very measures he employs to achieve it.	X	X		X	
Social Forces-agents of change in society... society must be moved to insure the preservation of the environment.		X	X	X	
Optimism-anticipating the best possible outcome ...man has the capacity to make this the best of all possible worlds.		X		X	X

Overview of Grade One

"Environmental education, to be meaningful, must prepare children to be aware, to be concerned, and to meet the challenge of the environmental problems that they will be inheriting."

Dr. V. Eugene Vivian,
Director at the Conservation and
Environmental Studies Center,
Glassboro State College, N.J.

The young elementary school child, through his experiences in an ever-expanding world, is gaining greater knowledge of himself and of his environment. His awareness of the world around him is growing through increased ability to use all his senses to interact with his immediate surroundings.

It is the purpose of this unit to give the child a variety of sensory and intellectual experiences with his immediate environment. In an effort to create in children a concern for all environments, opportunities are provided which allow the child to become aware of the outdoor environment thrcugh firsthand experiences. Activities are designed to develop the child's ideas about his own personal environment which consists largely of his home and school. The activities developed in this unit are of an interdisciplinary nature, and therefore will help the child understand some interrelationships and interactions within these segments of the total ecosystem in which he lives.

Having fostered the child's realization that the environment is made up of all living and non-living things and all elements of nature are interdependent with one another, we hope that the child will discover that what he does and learns now will, in the future, play an important part in the earth's environmental system.

Flowchart for Grade One

Week One

Generalizations

I. Living things are interdependent with one another and with their environment.

II. Living things are different from non-living things.

Activities

IIA1,2,3. Classify living and non-loving things.

IIA4. See filmstrip on living things.

IA,B.
IIB,C. Do experiment and make observations planting seeds.

Week Two

Generalizations

I. Living things are interdependent with one another and with their environment.

II. Living things are different from non-living things.

Activities

IIC1. Do experiment-looking at a seed.

IIC2. Do experiment-planting unidentified seeds.

IC. Walk around school grounds.

ID. Write experience chart - "What we have learned about seeds."

Week Three

Generalizations

III. Living things can change.

IV. Living things, plants, animals, and man, depend on one another and on non-living things.

Activities

IIIA. Make bulletin board and/or experience chart on seasons.

IIIB2. View filmstrip about Man's and Animals' response to seasonal change.

IIIB. Have children draw pictures about living things' response to seasons.

IVA. View filmstrip on plants and make chart.

IVB. Have classroom pet displayed.

Flowchart for Grade One

Week Four

Generalizations

IV. Living things, plants, animals, and man, depend on one another and on non-living things.

Activities

IVC. Have class discussion of care of pets.

IVD. Show filmstrip about animals and their homes.

IVE. Read books about animals' dependence on living things for food and shelter.

IVF1. Make bulletin board: Things Man gets from Living and Non-living Things.

IVF2. Classify foods according to direct or indirect products of plants.

Week Five

Generalizations

IV. Living things, plants, animals, and man, depend on one another and on non-living things.

V. Where man lives is his environment.

Activities

IVF3. Have class discussion of helpers in community.

VA1. Have class draw pictures of the following environments:
- a. Me and My School
- b. Me and My Home
- c. When I am Outside

VA2. Have display of class pictures.

VA3. List things in child's environments.

VA4. Derive a working definition of "environment"

Week Six

Generalizations

VI. The way an individual uses his environment is influenced by his perception of that environment.

Activities

VIA. Develop a list of child's responsibilities to environment.

VIB. Develop positive pollution prevention projects.

Grade One Generalization: II. Living things are different from non-living things.

Objectives

IIA. After these activities, the first grade class will classify things as living or non-living.

Activities and Strategies

Use activities 1 or 2, and/or 3,4,5.

IIA-1. Treasure Hunt
Plan with the children to go on a treasure hunt--a walk around the schoolyard to look for "treasures". Discuss with them before you go, some things they might find in your locality:

Rocks	Ants
Moss	Worms
Flowers	Frog
Feathers	Leaves
Grasshopper	Bugs
Seed pods	Sticks, etc.

Provide some sandwich bags or jars in which to put the treasures. When the class returns to the room each child places his treasure on a table for display.

Is there anything we should do to take care of these things? Most children will suggest putting flowers in water, punching holes in a jar lid to let grasshoppers or bugs get air, giving the frog some food. (Be sure to return animals to their homes afterward). By discussing each "treasure" the living and non-living things should be separated as children discover that rocks, sticks, feathers, etc. do not need to be provided with air, food, and water.

(Source: People and Their Environment Teacher Curriculum Guide to Conservation Education Grades 1, 2, 3)

Materials

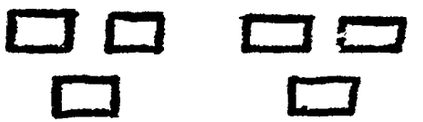
IIA1. Plastic bags or jars.

Evaluation

IIA1

Alive	Not-Alive
Plants	rocks
Animals	soil
	feathers
	water
	metal
	paper

Grade One Generalization: II. Living things are different from non-living things.

Objectives	Activities and Strategies	Materials	Evaluation
	IIA2. Set out on a table a rock, a potted plant, and a small animal (goldfish, earthworm, hamster, insect, etc.) in an appropriate container. Have the class describe the differences among these things. What similarities are there? What characteristics are peculiar to living things?	IIA2. A rock, a potted plant, and a small animal.	IIA2. Differences Likenesses
	IIA-3. Divide a bulletin board into parts: alive and not-alive. Display pictures from magazines and/or children's drawings. Class may also participate by telling where to place picture on bulletin board.	IIA3. Magazine pictures and/or children's drawings.	IIA3. Alive Not Alive 
	IIA-4. Show a filmstrip on living things.	IIA4. A filmstrip on living things obtained from your library.	
	IIA-5. Teacher writes a list of things found in the classroom on the board. The class is asked to classify the things alive or not alive. This activity may be oral or written.		IIA5. Children can correctly complete the classification.

Grade One Generalization: I. *Living things are interdependent with one another and with their environment.*

II. *Living things are different from non-living things.*

Objectives

IA. Given seeds, the class will hypothesize what will happen with the addition of certain elements (air, water, soil, light, and place to grow).

IIB. Given two weeks' observation of seeds in jars, class will conclude living things grow.

IB. Given two weeks' observation of seeds in jars, class will conclude living things need certain elements to grow (air, water, soil, light and place to grow).

Activities and Strategies

IA, B, & IIB. Put 6 seeds, baby food jars, (or milk cartons) some soil and a container of water on a table.

Teacher says - "Let's put a seed in this jar all alone. If we put the cap on, what will happen? Will it grow?"

Teacher records prediction on classroom chart.

Follow this procedure with each experiment. Students should be encouraged to make realistic predictions.

Observe for two weeks. Fill in observations on chart.

Note: Lima beans and/or peas are good examples to use.

Materials

IA, B, & IIB. 6 seeds, baby food jars, some soil & a container of water, chart paper and marker.

Evaluation

IA, B, & IIB.

Experiment	What do you think?	What did happen?
Seed alone		
Seed, water		
Seed, soil, Water, no air		
Seed, soil, No water		
Seed, soil, Water, air, No light		
Seed, soil, Water, air, Light		

Grade One Generalization: II. Living things are different from non-living things.

Objectives	Activities and Strategies	Materials	Evaluation
IIB 1. After this activity, class will state that a seed contains a baby plant.	IIB 1. Soak about 2 cups of lima beans overnight in water. The following day distribute about 3 lima beans to each child. Teacher says - "What are these? Did you know lima beans are really seeds? Today we're going to find out why they are seeds." "If we look inside the lima bean, what do you think we will find?...Let's find out." Class carefully removes skin from the bean. "Open the two halves and describe what you see." "What would happen if we planted this lima bean?" "Where would plant come from?"	IIB1. 2 cups of lima beans soaked overnight.	IIBI. Class responses: "Lima beans." "...leaves of a plant." Class should hypothesize that a plant would grow from the seed. "The seed has a baby plant in it."
IIB2. During this activity, the class will hypothesize what will grow from each of several kinds of seeds.	IIB2. Take several kinds of unidentified seeds. Discuss what might grow from each of the several kinds of seeds. Plant and see. N.B. A "Greenhouse" can be made by taping together plastic meat trays from the grocery store. Roof should be removable for watering of plants. An old lampshade frame makes an ideal support for a larger "greenhouse." Just cover the top and sides with plastic wrap or plastic dry cleaning bag and watch seedlings sprout.	IIB2. Packets of several seeds, milk cartons, soil. Note: Seeds that germinate within 2 weeks are: Peas, beans, radishes, marigolds, zinnias, and morning glories, if the seed is scratched to allow moisture to soak in.	IIB2. Dandelions grow from one kind. Peas from another kind of seed. Beans from another kind of seeds. Corn from another kind of seed.

The Instructor "Tips For Teachers"

Grade One Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IC. After viewing several filmstrips, reading a book, and discussing seeds, their growth and how they are scattered, the class on a class walk around school grounds can find seeds and answer these questions: 1. Who or what carried it where it is? 2. What kinds of seeds are around? 3. What plants will grow from these seeds?	IC1. View a filmstrip on seeds being scattered. 2. Read a book to class on seeds. 3. View a filmstrip on growth of plants.	IC1,3. Filmstrip on seeds and growth of plants obtained from your library. 2. Books on seeds obtained from your library.	IC. Take a walk in the fall and gather seeds for classroom display. Take a walk in the spring and notice seed development. flowers growing sprouts from seeds maple seeds may be found.
ID. As a result of all the above activities, the class will develop 4 generalizations about seeds: 1. A seed has a baby plant in it. 2. A particular seed will grow a particular plant. 3. Seeds travel. 4. Seeds need certain elements to grow (air, water, soil, light and a place to grow).	ID. Make a class chart of the generalizations.	ID. Chart paper and marker.	ID. Chart.

Grade One Generalization: III. Living things can change.

Objectives	Activities and Strategies	Materials	Evaluation
IIIA. After these activities, the class will state that living things change because of the weather (seasons).	IIIA1. Make a bulletin board of the seasons. IIIA2. Make charts of the seasons as class discusses each question. How do we know it's fall? How do we know it's winter? How do we know it's spring? How do we know it's summer? Use children's responses to develop the individual chart.		IIIA. How do we know it's spring? 1. Snow is gone. 2. Flowers are growing. 3. Days are longer. 4. Birds ar around. 5. We wear jackets, sweaters etc. 6. etc.
IIIB. Having established that living things change in response to the seasons, the child will hypothesize specific changes in response to the 4 seasons.	IIIB1. Teacher should ask questions about animals' or man's response to specific seasons e.g. a. What animals do we see in the spring? (fall? winter? summer?) b. What do animals do in the spring? (fall? winter? summer?) c. What kinds of things remind you of spring? (fall? winter? summer?) d. What kinds of things do you like to do in the spring? (fall? winter? summer") IIIB2. Show a filmstrip or filmstrips about the seasons.	IIIB1. Filmstrips about the seasons obtained from your library, 12 X 18 newsprint for class, crayons and pencils.	IIIB. Child is given 12 X 18 newsprint folded in quarters, labeled: Spring | Summer Fall | Winter Have child draw a picture in each quarter using the theme of: 1. A Tree Through the Seasons 2. Our Clothes Through the Seasons 3. Our Sports Through the Seasons.

Grade One Generalization: IV. Living things, plants, animals, and man, depend on one another and on non-living things.

Objective	Activities and Strategies	Materials	Evaluation
IVA. Having developed one example of plants' dependence on living things, class will list three other examples.	IVA. Use a filmstrip or book to show plants depend on other living things.	IVA. Filmstrip or books that show plants' dependence on other living things.	IVA. Plants depend on living things, Examples: 1. Some plants need trees for shade. 2. Some plants need animals for seed dispersal. 3. Some plants depend on other plants for place to grow. (fungi, mushrooms). 4. Some plants depend on other plants and animals for fertilization.
IVB. Using a classroom pet as example, class will state which non-living things animal needs.	IVB. Use a classroom pet as an example, e.g. an aquarium with a turtle with a flat rock provided for a resting place. (If a green slider turtle is used, it should be fed bits of raw beef, lettuce, and fruit.) Place a desk lamp so that it shines on part of the tank. It will help maintain the turtle's appetite by keeping it warm.	IVB. Classroom pet.	IVB. Turtle needs water. Turtle needs rock.
IVC. Using a classroom pet as example and a class discussion of how class takes care of it, class will conclude the pet depends on man's care.	IVC1. Discussion of good care of pets in classroom. May set up chart of rules for good pet care. IVC2. Students who have pets should be encouraged to make an oral report about the responsibilities they have to their own pets.	IVC. Chart paper and marker.	IVC. How We Care For Our Pets 1. We feed it daily. 2. We water it. 3. We provide a clean place for it to live. 4. etc.

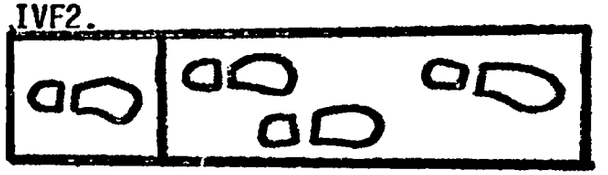
Grade One Generalization: IV. Living things, plants, animals, and man, depend on one another and on non-living things.

Objective	Activities and Strategies	Materials	Evaluation
IVD. Given a list of 5 animals and 5 different kinds of homes, class will match the name of the animal with the kind of home.	IVD1. Show a filmstrip about animals and their homes	IVD1. A filmstrip about animals and their homes obtained from your library.	IVD1. Given names of 5 kinds of homes, name more animals that live in them as result of seeing filmstrips.
	IVD2. List 5 animals. List 5 homes. Have class decide where each animal has its home by drawing a line between the animal's name and its home.	IVD2. Paper and pencils.	IVD2. Class answers correctly e.g. Robin----------tree Worm----------ground Bee----------hive Fish----------water Fox----------den
IVE. After reading some books on animal habits and environment, the class will state what living things animals depend on.	IVE. e.g. Green, Mary M., Everybody Eats Mason, George F. animal books. Verite, Marcelle, Animals and How They Live.	IVE. Books about animal habits and environments obtained from your library.	IVE. After each book, make a list of living things which animals depend on. After listing the living things depended upon, classify the dependence, e.g. food, safety.
IVF1. As a result of this activity, the class will decide that man, too, depends on living and non-living things.	IVF1. Construct a bulletin board or experience chart. Things We Get From Living Things. Things We Get From Non-Living Things. Use pictures from magazines or children's drawings to illustrate. Label each picture.	IVF1. Chart paper, marker, children's drawings and magazines, and pencils.	IVF1.

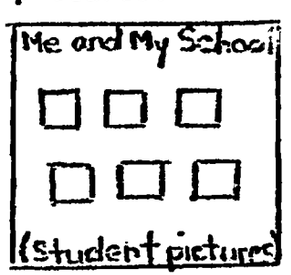
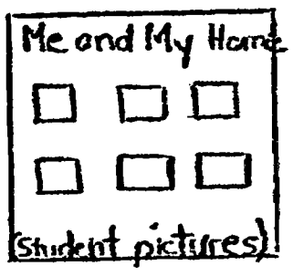
Things we get from living things.	Things we ge from non-liv ing things.

Grade One Generalization: IV. Living things, plants animals, and man, depend on one another and on non-living things.

V. Where man lives is his environment.

Objective	Activities and Strategies	Materials	Evaluation
IVF2. As a result of this activity, the class will classify foods as coming directly or indirectly from plants.	IVF2. Use pictures of food from magazines. These may be classified as "one step" or more than one step.	IVF2. Magazine pictures of food.	IVF2.  apple, peanuts, potatoes, beans, peas, lemons, tomatoes, chewing gum, jelly, peanut butter, candy, bacon, egg, macaroni
IVF3. As a result of these activities, the class will list 4 ways man depends on man.	IVF3a. Use any community helpers kit and class discussion. IVF3b. Have interested students role play different community helpers and their jobs.	IVF3. Any community helper kit e.g. community helpers picture packet, SVE.	IVF3. Man depends on man. e.g. 1. Grocer has our food. 2. Sanitation man picks up our garbage. 3. Farmer grows our food. 4. Doctor keeps us well.
VA. As a result of drawing and comparing pictures, the class will develop a working definition of the word - environment.	VA1. On 3 separate days, the class will draw pictures of the following: a. Me and My School. b. Me and My Home c. When I am Outside.	VA1. 12 X 18 newsparint, crayons and pencils.	VA1. Pictures drawn by the children.

Grade One Generalization: V. Where man lives is his environment.

Objectives	Activities and Strategies	Materials	Evaluation
	VA2. After the students have drawn their pictures, display them in a prominent place so that each child can look at all the pictures.		VA2. Children look at the pictures.  
	VA3. Ask the students to name all the things that are necessary in the following pictures: a. Me and My School. Display the list the class develops next to the class pictures. b. What things are necessary in the picture Me and My Home? c. What things are necessary in the picture When I am Outdoors?	VA3. Chart paper and marker.	VA3. Chart e.g. Me and My School desks board teacher pencil books etc.
	VA4. Write the titles of each scene on the board. Add the word environment to each. Ask the class to decide what environment means.		VA4. Me and My School Environment. Me and My Home Environment. When I am in an Outside Environment. e.g. "Environment is what I see around me."

Grade One Generalization: VI. The way an individual uses his environment is influenced by his perception of that environment.

Objective	Activities and Strategies	Materials	Evaluation
VIA. Having developed a working definition of environment, the class will list their responsibilities to each environment.	VIA. Make a list of individual responsibilities to each environment.	VIA. Chart paper, marker.	VIA. e.g. Me and My School Environment My responsibilities are: 1. To keep my desk clean. 2. To keep my coat hung up. 3. To leave cafeteria neat.
VIB. Given their environment, the class will decide what they can do to keep environment clean.	VIB. After developing a list of responsibilities to each environment, the class should develop positive pollution prevention projects. It is hoped that the class can plan and organize these projects. We have included the following projects as suggestions only. VIB1. Litterbags Ask: What is litter? (Anything out of its proper place). Make a list of words on the chalk board as children name things that are litter, e.g. paper, banana peelings, candy wrappers, sticks, toys, etc. What can we do to keep from becoming litterbugs? 1. Use trash cans for all out trash. 2. Remind others to use trash cans.	VIB. Did the class set up & carry out their own projects?	

Grade One Generalization: VI. The way an individual uses his environment is influenced by his perception of that environment.

Objective	Activities and Strategies	Materials	Evaluation

3. Pick up toys and clothes at home
4. Take turns being the trashman in the schoolroom.
5. Empty vases of dead flowers.
6. Keep desks clean.
7. Never throw litter out of cars.
8. Keep a litterbag in the family automobile and use it.

VIB2. Prepare before class, a mask from a big paper bag. You may dramatize being a "litterbug" by wearing the mask over your head and by throwing paper from the trash can over the room. This may be done by the teacher or a child.

Ask:

1. What am I?
2. What does a litterbug do?
3. Are you a litterbug?
4. Have you ever seen a litterbug before?
5. Tell me about places you have seen where litterbugs have been. Turn litterbug mask over, attaching pipe cleaner handles. Have a "good citizen" pick up the trash from the floor and put it in the litterbag.

VIB3. Take the class on a tour of the playground and building to examine the trash receptacles, filling the litterbag as you go. Count how many receptacles you find at your school. (If there are not enough to take care of the trash, write a letter to the school principal so that he might help.)

Before returning to the classroom, the children might see how much litter can be collected from a designated play area. You might have a contest, girls versus boys, to see which can collect the larger pile. All trash is placed in receptacles after the contest.

Grade One Generalization: VI. The way an individual uses his environment is influenced by his perception of that environment.

Objective	Activities and Strategies	Materials	Evaluation

VIB4. (One or more of these activities may be done.)
Children:
a) Make litterbug signs and place them in the halls of the school as reminders to others.
b) Each child makes a litterbag out of a brown paper bag, decorating it with art materials, and attaching a handle of pipe cleaners. He takes this home to keep in the family car.
c) Children look for litter to and from school and report on observations.
d) Children draw pictures of "neaterbugs" keeping things clean, and litterbugs spreading trash.
e) Play the litterbug game. Children form a circle, choose two people to play parts of litterbug and neaterbug, and sing this jingle to the tune of "Did You Ever See a Lassie":

Oh here comes a litterbug, a litterbug, a litterbug.
Oh here comes a litterbug
  Just see what he'll do.
  (Litterbug scatters paper within the circle).
I don't want to be a litterbug, a litterbug, a litterbug.
I don't want to be a litterbug
  And neither do you.

Oh here comes a neaterbug, a neaterbug, a neaterbug,
Oh here comes a neaterbug
  Just see what she'll do.
  (Neaterbug picks up trash and puts it in litterbag).
Oh I want to be a neaterbug, a neaterbug, an neaterbug.
Oh I want to be a neaterbug,
  And so do you!

Grade One Generalization: VI. The way an individual uses his environment is influenced by his perception of that environment.

Objective	Activities and Strategies	Materials	Evaluation
	VIB5. On the board or on chart paper, write a class story of two picnic baskets that went on a picnic. One went with a family of litterbugs, the other with a family of neaterbugs. Students then copy the stories on their own paper. Students may also illustrate the stories.		

GRADE ONE
APPENDIX

POEMS

This is a collection of poems for the teacher to use as seat work during the course of this unit.

NATURE NOTE

Undoubtedly the kangaroos
Have fun;
They hop because they do not choose
To run.

Arthur Guiterman

THE SQUIRREL

Whisky, frisky,
Hippity, hop
Up he goes
To the tree top!

Whirly, twirly,
Round and round,
Down he scampers
To the ground.

Furly, curly,
What a tail!
Tall as a feather,
Broad as a sail!

Where's his supper?
In the shell,
Snappity, crackity,
Out it fell!

Unknown

THE LITTLE RACCOON

The little furry
Brown raccoon
Plays and hunts
In the light of the moon.

The little raccoon
Is clean and neat.
He washes his food
Before he will eat.

He swims quite well
And climbs high trees;
Wears patches round his eyes
Instead of his knees.

Jean Brabham McKinney

CATTLE

How cool the cattle seem!
They love to swish their tails and stand
Knee-deep within the stream.

Banko

THE PEOPLE

The ants are walking under the ground,
And the pigeons are flying over the steeple,
And in between are the people.

Elizabeth Madox Roberts

ONLY MY OPINION

Is a caterpillar ticklish?
Well, it's always my belief
That he giggles, as he wiggles
Across a hairy leaf.

Monica Shannon

THE OCTOPUS

Tell me, O Octopus, I begs
Is those things arms, or is they legs?
I marvel at the Octopus;
If I were thou, I'd call me Us.

Ogden Nash

THE RAIN

Rain on the green grass,
And rain on the tree,
And rain on the house-top,
But not upon me!

Author Unknown

I love little pussy, her coat is so warm;
And if I don't hurt her she'll do me no harm.
So I'll not pull her tail nor drive her away,
But pussy and I very gently will play.

PEAS

I always eat peas with honey,
I've done it all my life,
They do taste kind of funny,
But it keeps them on the knife.

I SEE THE MOON

I see the moon,
And the moon sees me:
God bless the moon,
And God bless me.

RABBIT

I'd like to run like a rabbit in hops
With occasional intermediate stops.
He is so cute when he lifts his ears
And looks around to see what he hears.

Tom Robinson

THE RHINOCEROS

The Rhino is a homely beast,
For human eyes he's not a feast,
But you and I will never know
Why Nature chose to make him so.
Farewell, farewell, you old rhinoceros,
I'll stare at something less prepoceros.

Ogden Nash

MOLES

Don't you feel sorry
For grubby old moles,
Always in tunnels,
Always in holes,
Never out watching
The sun climb high
Or the grass bend low
Or the wind race by
Or stars make twinkles
All over the sky?

Aileen Fisher

MY SUN

Sunrise,
Sunset,
I can hold you
In my hand.
Bet?

Margo Duryea

BLACKBIRD'S SWING

In my tree
I can see,
When the wild winds blow,
Here and there
And everywhere,
Blackbirds high and low,
Having fun
In the sun,
Bouncing to and fro.

Nina Willis Walter

YELLOW-SHAFTED FLICKER

The flicker is a miser
Pocketing his gold---
You can see
How rich he is
When his wings unfold!

Jeannette Carlberg Kaulfers

CELERY

Celery, raw,
Develops the jaw,
But celery stewed,
Is more quietly chewed.

Ogden Nash

THE PURPLE COW

I never saw a Purple Cow,
I never hope to see one,
But I can tell you, anyhow,
I'd rather see than be one!

MOTHER, MAY I GO OUT TO SWIM?

'Mother, may I go out to swim?"
"Yes, my darling daughter,
But hang your clothes on a hickory limb,
And don't go near the water."

SPRING FLOWERS

Pussy willows
Are spring flowers
They appear
When April showers.

Pauline C. Peck

Under the willow
With a leaf stuck in his mouth
The puppy sleeps.

Issa

The face of the dragonfly
Is practically nothing
But eyes.

Chisoku

A mother horse keeps watch
While her child
Drinks.

Issa

The old pond.
A frog jumps into the water---
SPLASH.

Basho

I could eat it!

This snow that falls

So softly, so softly.

Issa

THE CATERPILLAR

Brown and furry, caterpillar in a hurry,

Tell me why you can't fly.

"It just happens that my feet stick.

So I stay on the branch. Then I die,

To live again, a butterfly.

Laurene Germanowski
Age 8
Canaan, N.Y.

MY WEEPING WILLOW TREE

How sad he must be,

My weeping willow tree;

He cries all day,

He wants me to play,

But I'm in school till three.

Patricia Lucai
Age 9
Hillsdale, N.J.

Teachers' Resources
Children's Books

Grade 1

Animal Homes
Mary M. Green, Everybody Has a House

George Mason, Animal Homes

Ella Podendorf, The True Book of Animal Homes

Martha Shopp, Let's Find Out About Animal Homes

Animal Habits and Behaviors
Glenn Blough, Who Lives in This House?
Who Lives in This Meadow?

Margaret Buck, Where They Go in Winter

Carl P. Schmidt, Homes and Habits of Wild Animals

Niko Tinbergen, Animal Behaviors

Marie H. Ets, In the Forest

Plants
William Foster, Seeds are Wonderful

Millicent Selsam, Seeds and More Seeds

Irma Webber, Bits that Grow Big

Glenn Blough, Plants 'Round the Year

Gene Darby, What is a Plant

Periodicals

Audubon

National Audubon Society
1130 Fifth Avenue
New York, N.Y. 10028

Conservation Report; Conservation News, National Wildlife, and Ranger Rick's Nature Magazine

National Wildlife Federation
1412 Sixteenth St., N.W.
Washington, D.C. 20036

Teacher Resources

Periodicals (cont.)

Environment
Committee for Environmental Information
438 N. Skinker Boulevard
St. Louis, MO 63130

Environmental Education News
Michigan Department of Natural Resources
Lansing, MI 48926

Natural History
The American Museum of Natural History
Central Park West at 79 Street
New York, N.Y. 10024

Nature Conservancy News
Nature Conservancy
2039 K Street, NW
Washington, D.C. 20006

Outdoor News Bulletin
Wildlife Management Institute
709 Wire Building
Washington, DC 20005

Regional Conservation Education Newsletter
Forest Service
U.S. Dept. of Agriculture
633 W. Wisconsin Avenue
Milwaukee, WI 53203

Ecology Picture Books for Grades 1 & 2

Jeff Brigham

Particular picture books which contain environmental and ecological concepts are easily accessible to primary teachers and should be recognized as immediate means of environmental education. One concept appearing quite frequently in state environmental education guides and also in picture books stresses that animals and plants are both independent and interrelated within an ecosystem.

The following bibliography lists books which give major emphasis to three concepts--environmental symbiotic state, composition, and animal populations.

Symbiotic state refers to two different organisms living together and benefitting from this relationship.

Aruego, J.: Symbiosis, A Book Of Unusual Friendships. Scribner, 1970.

Bentley, L.: Plants that Eat Animals. McGraw-Hill, 1968.

Blough, G.: Who Lives in This Meadow? McGraw-Hill, 1961.

Buff, M.: Elf Owl. Viking, 1968.

Fisher, A.: Where Does Everyone Go? Crowell, 1961.

Freschet, B.: The Owl and the Prairie Dog. Scribner, 1969.

Friskey, M.: The True Book of Birds We Know. Childrens Press, 1954.

Garelick, M.: Where Does a Butterfly Go When It Rains? Scott, 1961.

Gay, Z.: Who Is It? Viking, 1957.

Green, M.: Everybody Has a House and Everybody Eats. Scott, 1961.

Hurd, E.: The Day the Sun Danced. Harper and Row, 1966.

Jordan, H.: Seeds by Wind and Water. Crowell, 1962.

Lathrop, D.: Follow the Brook. Macmillan, 1967.

The environment is composed of many diverse elements. Each is an integral, unique contribution to a healthy ecosystem.

Bendick, J.: Why Can't I? McGraw-Hill, 1969.

Caudill, R.: A Pocketful of Cricket. Holt, 1964.

Darby, G.: What Is a Turtle? Benefic, 1960.

Fisher, A.: We Went Looking. Crowell, 1968.

Gibson, G.: Garden Dwellers. Melmont, 1958.

Goetz, D.: Swamps. Morrow, 1961.

Hiser, I.: The Coyote. Steck-Vaughn, 1968.

Hornblow, L.: Fish do the Strangest Things. Random House, 1960.

O'Neill, M.: Hailstones and Halibut Bones. Doubleday.

Schwartz, E.: Cottontail Rabbit. Holiday House, 1957.

Animal populations are important economically, aesthetically, and biologically.

Allen, G.: Everyday Animals. Houghton Mifflin, 1961.

Brown, M.: Pip Camps Out. Golden Gate, 1966.

Buff, M.: Forest Folk. Viking, 1962.

Conklin, G.: Lucky Ladybugs. Holiday House, 1968.

Dolch, E.: Friendly Birds. Garrard, 1959.

Fisher, A.: Up, Up the Mountain. Crowell, 1968.

Gerelick, M.: What Makes a Bird a Bird? Follett, 1969.

Goudey, A.: Houses from the Sea. Scribner, 1959.

Hawes, J.: Watch Honeybees with Me. Crowell, 1964.

Hess, L.: The Curious Raccoons. Scribner, 1968.

Kumin, M.: Spring Things. Putnam, 1961.

Limmer, H.: My Kangaroo Phoebe. Hill and Wang, 1970.

Miles, B.: A Day of Summer, Knopf, 1960.

Mizumura, K.: The Way of an Ant. Crowell, 1970.

Ross, G.: What Did the Rock Say. Holiday House, 1970.

Schoenherr, J.: The Barn. Little, Brown, 1968.

Tresselt, A.: Timothy Robbins Climbs the Mountain. Lothrop, 1960.

Wildsmith, B.: Brian Wildsmith's Wild Animals. Franklin Watts, 1970.

Wong, H.: Pond Life: Watching Animals Grow Up. Addison-Wesley, 1970.

EAST SYRACUSE-MINOA SCHOOLS

Environmental Education Materials

Elementary Unit

Grade Two

Produced Under USOE Grant OEG-0-71-4621
by East Syracuse-Minoa Central Schools
407 Fremont Road
East Syracuse, N.Y. 13057
Dr. Fritz Hess, Superintendent

Grade 2

Introduction

"Each child should grow up knowing and understanding his place in the environment and the possible consequences of his interaction with it".

William Murdoch, The House We Live In.

The average second grade student in ESM has an idea of his environment which is limited by his age and his experience with it. He is neighborhood oriented. Through the activities in this unit, the student will expand his idea of his environment to include the whole ESM school district. Using this area as the outside boundary of his environment, we have tried through an interdisciplinary inquiry-oriented experience approach to make the child aware that by the fact of his living in this area, he causes some changes in it.

We hope to accomplish our goal with a variety of experiences that rely heavily on the child's sensory perceptions. Also, we feel that for the unit to be most beneficial it should be taught in an interdisciplinary manner. The children will observe a terrarium as a closed interdependent environment. A field trip with a guide for teachers has been planned to acquaint the class with pollution in their community. The information gathered during their trip will be used in later activities. We have collected strategies for classroom investigation of pollution, to provide for individual choice by teachers according to their own method. Many of the activities include experiments that demonstrate that man can and does cause change in his environment.

Finally, we hope that after making the child aware of the environmental situation, he will demonstrate what he can do to avoid further destruction of his environment. Possible choices are suggested in the unit, although it is hoped the children will devise their own activities.

Flow Chart for Grade Two

Week One

Generalizations

I. Living things are interdependent with one another and with their environment.

Activities

IA3. Set up the terrarium.

IA5-9. Observe the terrarium.

Week Two

Generalizations

I. Living things are interdependent with one another and with their environment.

II. The energy requirements of man are met primarily by "food", and men are dependent upon other organisms through food chains and food webs.

Activities

IB. Observe the terrarium

IC. Develop web of dependence from the terrarium.

IIA. Draw pictures for food chain.

IIB. Do ditto of food chain bulletin board.

IIC1. Construct food chain bulletin board.

IID2. Introduce problem of polluting the terrarium.

Week Three

Generalizations

III. Man's efforts at changing the environment to fulfill his needs are often beneficial to him but harmful to the environment.

IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Activities

IIIA1 & 2. Parrallel the terrarium with the child's own world.

IIIB1. Show slide collection #1.

IIIB3. Show slide collection #2.

IVA2. Derive working definition of pollution.

Week Four

Generalizations

IVB. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the enviroment becomes limited in its usefulness.

Activities

IVB.1. List the kinds of pollution.

IVB. 2. Categorize in 4 main kinds (air, water, land, man).

IVC. In preparation for field trip, complete check sheet for pollution using Teacher Picture Packet #1.

IVD. 1. Go on field trip with checksheet and tape recorder..

IVD. 2. Make classroom chart of trip.

IVD. 3. Re-examine working definition of pollution.

Week Five

Generalizations

I. Living things are interdependent with one another and with their environment.

V. Pollution can also be defined as the addition of foreign matter to the environment to a degree which is insupportable by nature.

Activities

IVD. 4. Refine the web of dependence into a web of interdependence.

V. Do an experiment to determine relative harmfulness of man's changes on the environment.

ID. Do activities about trees.

VB. Do activities about Johnny Appleseed.

Week Six

Generalizations

VI. In order to preserve our threatened environment, present attitudes must change to reflect a widespread public concern which will encourage protective action by individuals, groups and government.

Activities

VI. Develop positive pollution prevention projects.
Do them.

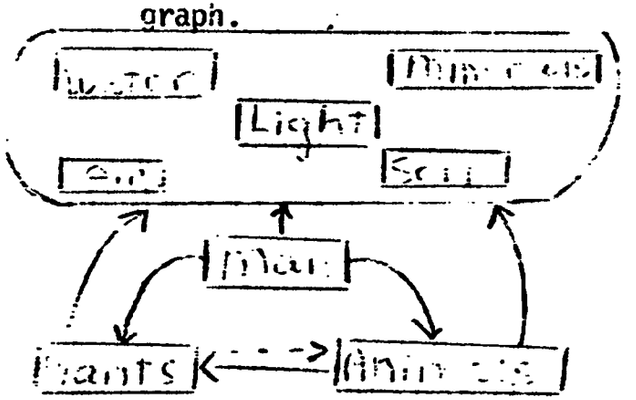
Grade Two Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IA. After setting up a terrarium, the student can answer these questions: Why add soil? Why add water? Why add plants? Why add animals?	IA1. The teacher suggests: "Is there anyway we could bring the outside world in and put it in this jar? "What do we need to bring into the classroom so that our outside world can live inside?"	IA1. An aquarium or glass gallon jar.	IA1. A terrarium. trees, ground, animals, plants, etc.
	IA2. "Let's go around our school and collect what we need. If you dig up a plant, make sure you carefully dig down for the roots."	IA2. Use spoons and bags.	IA2. Students collect things.
	IA3. Construct the terrarium. Make sure the terrarium is covered.	IA3. Jar cover, saran wrap, or glass, etc.	IA3. 
	IA4. "We've made our own little world with plants and animals. It's called a terrarium.		
	IA5. Place it on a shelf or counter away from direct sunlight so that the class can watch the terrarium.		

Grade Two Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
	IA6. Have the class label their terrarium on a chart displayed near it. Name the things in their terrarium.	IA6. Chart paper, markers.	IA6. Not every terrarium will contain the same things.
	IA7. Place popsicle sticks beside plants to measure their growth.	IA7. Popsicle sticks.	
	IA8. Place 2 small thermometers, one on the counter outside the terrarium and one inside the terrarium. Have the children compare the temperatures, and keep a daily record of the temperature of the terrarium on the chart.	IA8. 2 thermometers.	
	IA9. After watching their terrarium being constructed, ask them to swer these questions: a. Why add water? b. Why add soil? c. Why add plants? d. Why add animals?		IA9. Responses of children may include. e.g. "You need soil and water to make plants grow." " Terrarium has everything it needs to grow".
IB. After observing the terrarium and/or the aquarium for two or three days, the second grade student can answer these questions: (if unanswered above) Why doesn't everything die? Why is plant life growing? What are the animals eating? Will we need to add food for animals?	IB. Observation of terrarium.		IB. Students will draw pictures of the terrarium includidng all that they see and label each thing with L for living things and NL for non-living things.

Grade Two Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
Will we need to add water? What makes the rain in the terrarium. IC. After observing the terrarium, the second grade class should be able to map out a graphic representation of the chain of dependence in the terrarium using these six labels, light, air, water, soil, plants, man, animals.	IC. Observation of terrarium.	IC. Chart paper and marker.	IC. Class should be able to construct a graph with the solid arrows. A class discussion may help come up with broken arrow graph.  Web of dependence should be placed on chart and mounted in prominent place in classroom.

Grade Two Generalization: I. Living things are interdependent with one another and with their environment.
V. Pollution can also be defined as the addition of foreign matter to the environment to a degree which is insupportable by nature.

Objectives	Activities and Strategies	Materials	Evaluation
ID. Having developed a chain of interdependence, the child can hypothesize the result of the removal of one link in the chain.	ID1. Have class read "Links of Life---Food Chain" by Robert Gray	ID1. "Links of Life---Food Chain" located in the appendix.	
	ID2. Show slide collection #C and ask questions that go with it.	ID2. Slide collection #C, obtained in school library, and script "Run For Your Life" in appendix.	
	ID3. Teacher or students write a 5 or 6 sentence paragraph about a world without trees.		ID3. Ideas suggested a. Trees as shade & beauty. b. Trees for building. c. Trees as source of oxygen. d. Trees as home for animals. e. Trees as sources of food. (fruits & nuts) etc.
	ID4. This activity may be incorporated with an Arbor tree planting.	ID4. Poem---"An Arbor Day Tree." found in appendix.	ID4. Students may draw pictures to illustrate the poem.
VB. Given "Johnny Appleseed," the class will discuss his affect upon his environment.	VB. Read story of Johnny Appleseed. Teacher may also utilize the poems and songs about Johnny Appleseed contained in the appendix.	VB. Story of Johnny Appleseed, poems and songs about Johnny Appleseed contained in appendix.	

Grade Two Generalization: II. The energy requirements of living things are met primarily by "food" and living things are dependent upon other organisms through food chains and food webs.

Objectives	Activities and Strategies	Materials	Evaluation
IIA. Given the elements of a food chain, the students will be able to draw pictures of the elements.	IIA. List the words Ex. 1. grass, cow worm, bird, 2. grass, cow, milk, children worm, bird, cat Have students draw pictures to go with words.	IIA. Crayons, construction paper.	IIA. Students draw appropriate pictures.
IIB. Given a ditto with pictures and yarn, the second grade student will paste the elements in a food chain.	IIB. Ditto #1.	IIB. Ditto #1 in appendix, and yarn.	IIB. This activity has been designed to reinforce the language art's skill of sequence. This activity may be done in the morning as seatwork and discussed in the afternoon.
IIC1. Using empty boxes, wrappers, magazine pictures, the second grade class will construct a food chain bulletin board tracing the product to its sources.	IIC1. Construct the bulletin board.	IIC1. Empty boxes, wrappers, magazine pictures and marker.	IIC1. Man is related to everything around him.

Our Breakfast Food chain

Butter → milk Cream → C... → gra...

Bacon → pig → corn

Bread → flour → wheat

orange juice → orange → orange tree

egg → hen → corn

Grade Two Generalization: II. The energy requirements of living things are met primarily by "food" and living things are dependent upon other organisms through food chains and food webs.

Objectives	Activities and Strategies	Materials	Evaluation
IIC2. After constructing the bulletin board, the second grade students will answer these questions: What plants or plant products are included? What do plants and animals need to survive? What animals provided the meat foods? If the food sources are removed, what will happen to man? What can or does man do to protect his food supply? (EEIA)	IIC2. Answer questions based on the bulletin board.		IIC2. Responses of class may include: "Bread comes from wheat". "Bacon comes from pigs". "Milk comes from a cow." "Plants and animals need food, water, air, light." "Killing wildlife and plant-life is killing themselves." "Farmer fertilizes his crops." "Farmer feeds animals grain."
IID1. Having developed a chain of dependence, the child can hypothesize the result of the addition of certain elements into the terrarium or aquarium: 1. Smoke 2. Detergent 3. Garbage 4. Insecticides.	IID1. Teacher says-"Let's take our terrarium world and introduce the one link in web of dependence not already there-man. What will man bring to the system? What will happen to the terrarium when man lives in it? Teacher may question-"How does man pollute?" Teacher suggests "Let's add these one at a time to our terrarium. What will happen?"		IID1. Child may say "Man pollutes it." Class may list-"Air pollution." -Smoke "Water pollution"-Detergent "Garbage" "Kill the animals."-Insecticides Child may say-It will die.

Grade Two Generalization: II. The energy requirements of living things are met primarily by "food" and living things are dependent upon other organisms through food chains and food webs.

Objectives	Activities and Strategies	Materials	Evaluation
IID2. Given the problem of possible destruction of terrarium life, the second grade student will make value judgement based on information obtained from class discussion.	IID2. Teacher asks-"Should we prove it in our terrarium?" Alternatives include- 1. Delaying decision. If decision is against destruction, class should be told about a trip through ESM district which will show what addition of these elements is doing in community. 2. Doing experiments. If decision is to do the experiments: a. Smoke-Have someone who smokes add through tube 2 puffs each day for a week into the terrarium. b. Garbage-Have someone put garbage into the terrarium. c. Water pollution-Have someone add detergent and/or clorox to water supply in terrarium. d. Killing animals-Have someone spray insecticide into the terrarium.	IID2. If class decides to experiment: cigarette smoker, garbage, detergent and/or clorox, insecticide.	IID2. Class should list arguments pro and con. Teacher should make it clear that once the terrarium is dead, it is gone. Pro 1. We don't know what will happen. 2. It's just a terrarium. Con 1. Everything will die. 2. We took a lot of time making it. 3. We enjoy watching it. Class will observe and note changes occuring in terrarium as a result of each addition.

Grade Two Generalization: III. Man's efforts at changing the environment to fulfill his needs are often beneficial to him but harmful to the environment.

Objectives	Activities and Strategies	Materials	Evaluation
IIIA1. Given their observations of what occurs in the terrarium and their idea of environment, the children can list likeness and differences between the two.	IIIA1. Teacher asks-"We built a little world, the terrarium. How is this little world like the world in which we live? How is it different?		IIIA1. Likenesses 1. The terrarium has animals, plants, water, soil, air, light. Differences 1. The terrarium doesn't have houses, roads, people, mountains, cars, trains, bigger animals, etc.
IIIA2. Given the list of likenesses and differences obtained above, the children will conclude that man makes the differences.	IIIA2. Teacher asks-"Why is the world we live in different from the terrarium?"		IIIA2. We live in the world not in the terrarium. We need houses, cars, roads, factories, stores, farms, etc., therefore, we make these things.
IIIB1. Given a group of slides, the child will state that man doesn't live here.	IIIB1. Show slides collection #1.	IIIB. Environmental Education slide collection #1 and 2 obtained from your library.	IIIB1. Responses of students: "Man doesn't live here".
IIIB2. Having viewed each slide, the child can hypothesize what might happen if man lived there.	IIIB2. Guide the discussion to include food chains and the web of dependence. e.g. trees are homes of animals, have food for animals, create shade for other plants and animals, when cut down, take it all away.		IIIB2. Child will state basic alterations to the environment caused by man. ...cut down trees, etc.

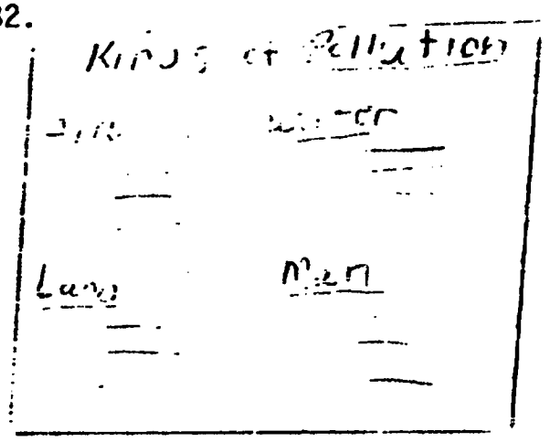
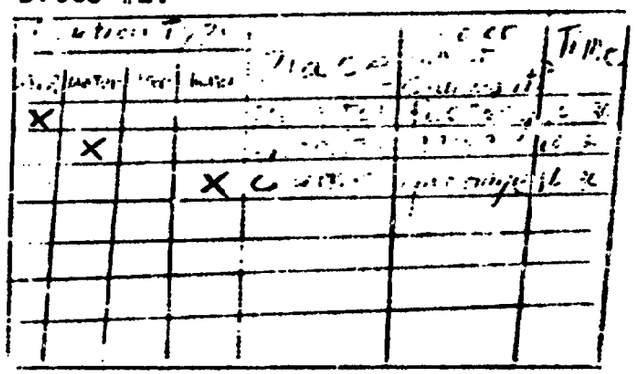
Grade Two Generalization:

III. Man's efforts at changing the environment to fulfill his needs are often beneficial to him but harmful to the environment.

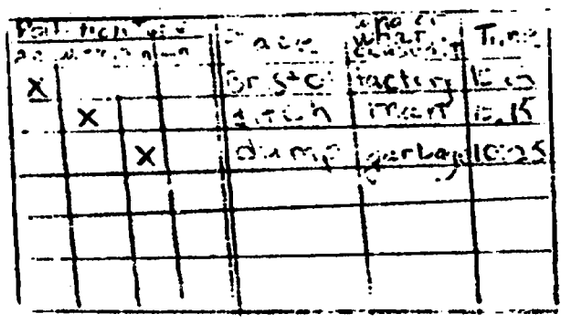
IV. Pollution can be defined as the alteration of the environment through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
IIIB3. Having viewed a group of slides which show man and man's effect on his environment, the child will test his hypotheses.	IIIB3. Show slide collection #2.		IIIB3. N.B. Will contain man and man's effects on his environment, some with pollution, some without pollution.
IVA1. Given the list of man's changes on his environment, the child will tell when change becomes pollution.	IVA1. List the changes or effects man has caused on his environment as shown on slides.	IVA1. Slide collection #2 chartpaper & marker.	
IVA2. Having judged when change becomes pollution, the child will form a working definition of pollution.	IVA2. The class will write a working definition of pollution.		IVA2. N.B. Definition of pollution should change as they progress through the unit. i.e. "Something bad that man put into the world."
IVB1. Through a discussion, the children will list as many kinds of pollution as they can.	IVB1. Make an experience chart or chalkboard list.	IVB. Chartpaper and markers.	

Grade Two Generalization: IV. Pollution can be defined as the alteration of the environment through the activities of man, in such a manner that the environment becomes limited in its usefulness.

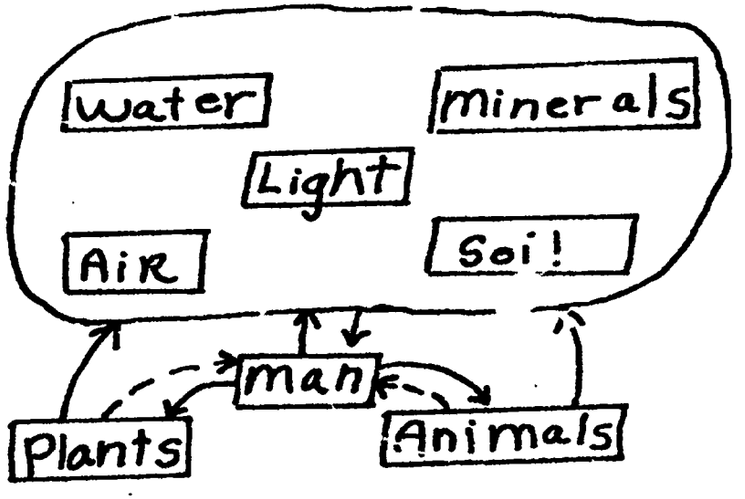
Objectives	Activities and Strategies	Materials	Evaluation
IVB2. Given the list of the many kinds of pollution, the children will categorize at least 4 kinds of pollution: air, water, land, man, natural.	IVB2. 		IVB2. Possibly: Natural; bacteria, viruses. N.B. Illustrate the chart with magazine pictures, children's drawing, newspaper articles. Test: Have child make a drawing of a kind of polltuion. Have child label it. With child covering his label, have class decide how drawing should be labeled. Check child's label.
IVC. Given the worksheet and pictures from teachers' picture packet at 5 min. intervals, the child will complete worksheet as demonstrated with 75% accuracy.	IVC. Use Teachers' Picture Packet Ditto #2.  Discuss use of worksheet on field trip. (Orientation for field trip).	IVC. Worksheet, Teachers Picture Packet. Ditto #2. in appendix.	

Grade Two Generalization: IV. Pollution can be defined as the alteration of the environment through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
IVD1. Given a 20-25 minute tour of several points of interest in ESM area, the child will complete the worksheet identifying the pollution found in their community with 90% accuracy.	IVD1. Use worksheets. Ditto #2.	IVD1. Worksheets, ditto #2 in appendix, and pencils.	
IVD2. Given a classroom discussion of the completed worksheets and tape, children and teacher will make a classroom chart of the kinds of pollution found in ESM area.	IVD2. 	IVD2. Chartpaper and markers.	
IVD3. After these activities, class will reexamine their definition of pollution to see if it is still appropriate.	IVD3. Discuss: How air pollution effects the web of dependence. How water pollution effects the web of dependence. How land pollution effects the web of dependence.		

Grade Two Generalization: IV. Pollution can be defined as the alteration of the environment through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
IVD4. After these activities, class will re-examine web of dependence and establish interdependence in it.	IVD4. Class looks at chart.		IVD4. The class will add broken lines to graph to show that it is really a web of interdependence. (What affects one part of the web, affects the whole web).



Grade Two Generalization: V. Pollution can also be defined as the addition of foreign matter to the environment to a degree which is insupportable by nature.

Objectives	Activities and Strategies	Materials	Evaluation
	Note: It is possible to do the following experiments in several different ways. For example, the teacher may accomplish a number of experiments at the same time by dividing the class into committees, or she may do one experiment at a time for the class. (Combine any way it is most feasible for you and your class.) Those experiments that are stared are designed for optimal effect in the unit.		
VA. As the result of this experiment, the children will observe and record the effects of altering the basic web of interdependence.	VA. Plant grass or bean seeds in individual milk cartons so that you have enough to try these: 1. Have a control group. 2. Add a detergent solution instead of water each day. 3. Spray with insecticide each day. 4. Add chemical fertilizers. 5. Add natural fertilizers. 6. Plant some seeds in sandy soil. 7. Plant and keep in dark place. 8. Plant and don't water. 9. Plant and over-water. (drown it).	VA. Bean seeds, milk cartons, insecticide, detergent, chemical fertilizer, natural fertilizer, sandy soil, water, popsicle sticks, and ditto #3 in appendix.	VA1. Children should observe and record results of the addition of the elements to growth of plants. Measure and mark the growth of the plants on popsicle sticks. See ditto #4, p. 22F VA2. Children should be aware of which elements are pollutant. They should also be able to tell what part of web of interdependence will be affected.

Grade Two Generalization: V. Pollution can also be defined as the addition of foreign matter to the environment to a degree which is insupportable by nature.

Objectives	Activities and Strategies	Materials	Evaluation
	VC. Organize a class-sponsored cleanup of the school grounds. After the students have participated in this anti-litter campaign, have them compile a list of the common forms of waste found, and discuss how this litter could have been reused. A number of manufacturers are offering bounties for their containers when returned in quantity after use. An interesting project might be to contact one such company, learn the details, and embark on a moneymaking venture by collecting these containers for cash. Profits from this effort could be used to sponser a modest community environment improvement plan.	VC. Little bags.	VC. Why do people litter their environment? Knowing this, are there any ways we could convince the community of the need to abandon this style of living? How does government (local, state, federal) attempt to control littering? How successful are these measures? What could be done to improve them?
VD1. After compiling or being given a list of objects, the child will decide the kind of pollution it can cause, and the preventability or controlability of its pollution.		VD1. Chart paper, markers.	VD1. These activities have been designed as an evaluation of our unit. Good luck!

Object	Kind of Pollution	Control or Prevent
Paper towel	land or air	Control
Glass	land	Prevent
Plastic	land or air	Prevent
Automobile	land or air or Man	Control

Grade Two Generalization:

V. Pollution can also be defined as the addition of foreign matter to the environment to a degree which is insupportable by nature.

VI. In order to preserve our threatened environment, present attitudes must change to reflect a widespread public concern which will encourage protective action by individuals, groups, and government.

Objectives	Activities and Strategies	Materials	Evaluation
VD. Given "Antipollution Song" the class will compose a verse or verses dealing with air and/or man pollution.	VD. After singing the song, the class will write additional verses.	VD. "Anti-pollution Song" found in appendix.	VD. Verses written by the class.
VIA. As a result of this unit, the child will have a changed attitude towards pollution in the environment as evidenced by participation in positive pollution preventive activities.	VIA. Write letters to your legislator to show your support of anti-pollution legislation. Have the child's parent read, sign and send the letter.		VIA. Did the child set up and carry out his own projects?
	VIB. Organize an ecology corps for classroom and school grounds. Have corps plan clean-up campaign. (Clean desk.)		
	VIC. Have class develop pledge about pollution control for parents' signature.		
	VID Have class develop recyclement campaign. Plan newspaper and cloth collection for recyclement. (Maybe project for PTO).		
	VIE. Make paper buttons for Anti-Pollution campaign.		

VIE.

Grade Two Generalization: VI. In order to preserve our threatened environment, present attitudes must change to reflect a widespread public concern which will encourage protective action by individuals, groups, and government.

Objectives	Activities and Strategies	Materials	Evaluation
	VIF. Decorate an old oildrum from a gas station. Use in recyclement campaign for storage of bottles and cans until they can be taken to recyclement center. Use money obtained in campaign to buy a tree for school or to use for other beautification project. Involve PTO.		
	VIG. Have a Huck Finn Day to learn how to fish correctly. Invite a Ranger from Green Lakes State Park to speak about fishing.		
	VIH. Make bird feeders for winter feeding of birds.		
	VII. For gifts this year, make an assortment of reusable terrycloth napkins. Have class decorate them.		
	VIJ. Ask cafeteria to use paper straws instead of plastic straws.		
	VIK. Have handtowels for use in classroom instead of paper towels.		

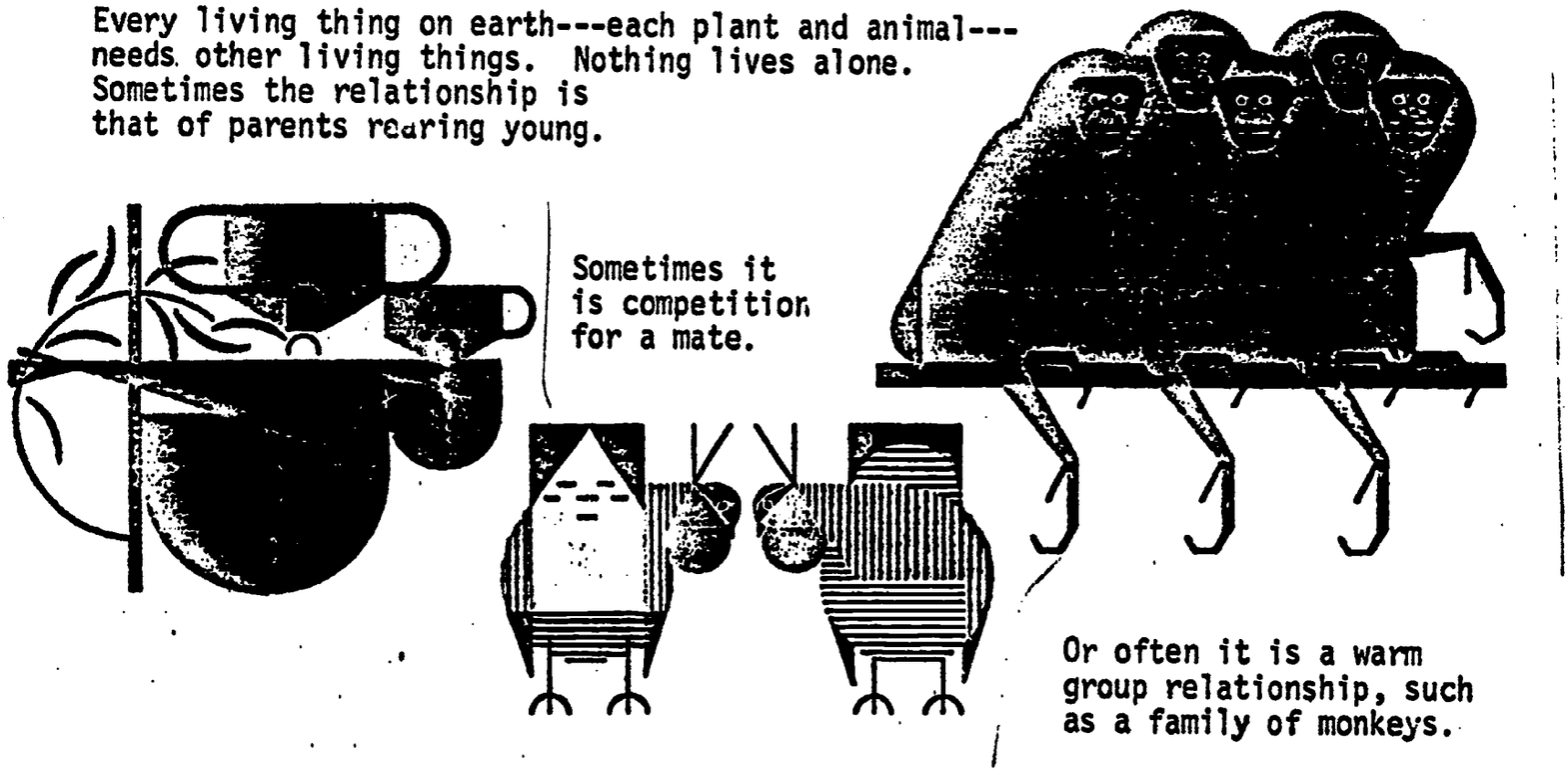
APPENDIX

LINKS OF LIFE

FOOD CHAINS

by Robert Gray

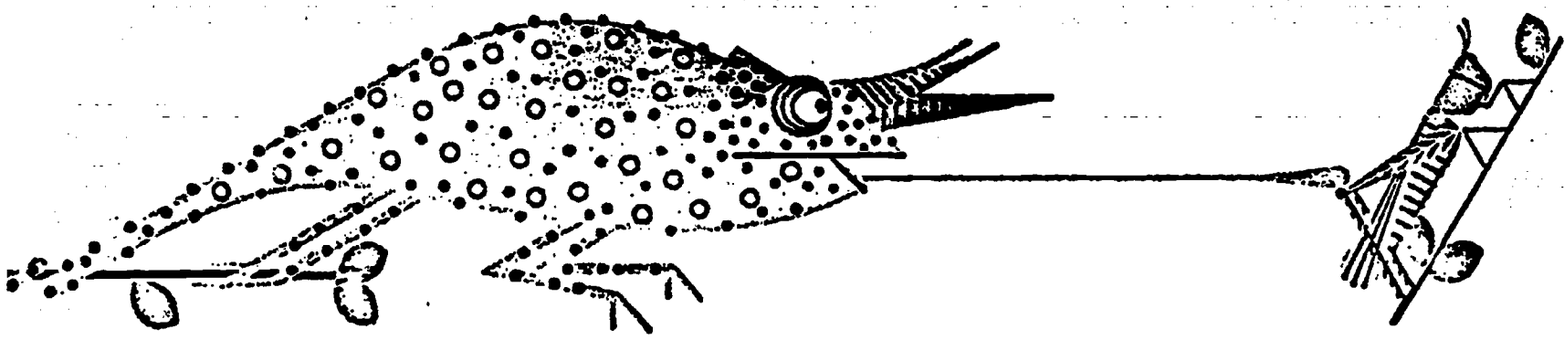
Every living thing on earth---each plant and animal---needs other living things. Nothing lives alone. Sometimes the relationship is that of parents rearing young.



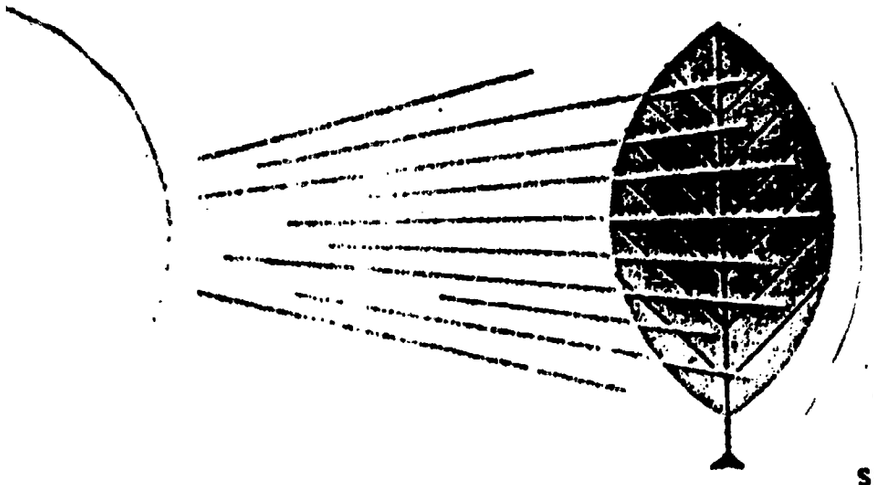
Sometimes it is competition for a mate.

Or often it is a warm group relationship, such as a family of monkeys.

And sometimes the relationship is that between the hunter and the hunted:
he who eats
and he who is eaten.



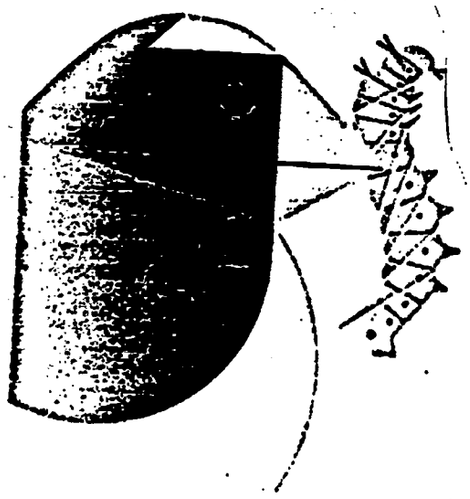
For life survives by feeding on other life. This relationship is called a food chain. Some food chains are simple, others are complicated.
All have this in common: They begin with the sun.



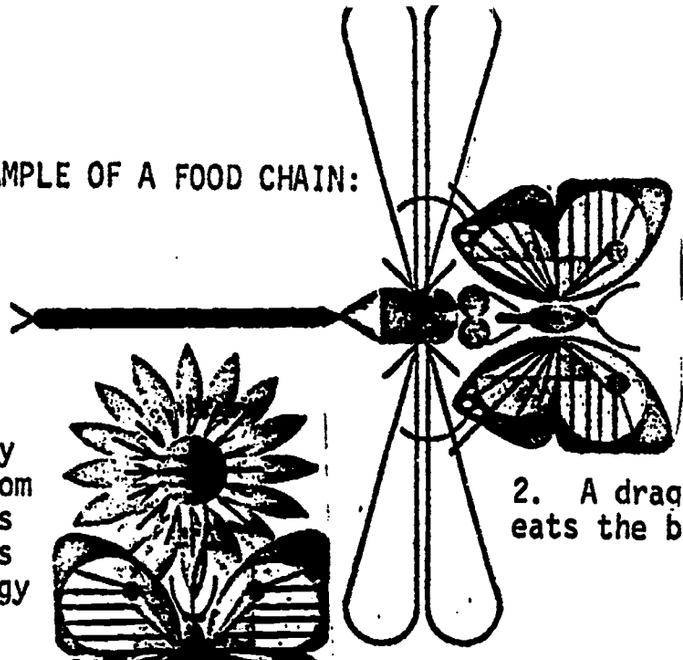
All life is tied directly or indirectly to energy from sunlight. Plants are the only living things that can use this energy directly. Their leaves are tiny factories which use sunlight to make food from water and minerals in the soil and carbon dioxide in the air. This process is called photosynthesis.

Plants, in turn, feed all other living things. Animals can only use the sun's life-giving energy after plants have changed it into food. Animals that feed on plants are called herbivores.

When these animals are eaten by the carnivores---the meat eaters---the sun's energy is passed on again.

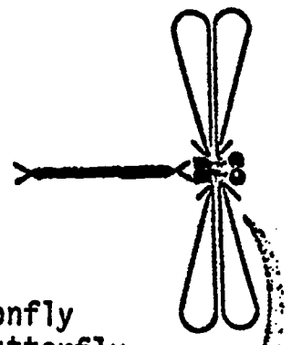


HERE IS AN EXAMPLE OF A FOOD CHAIN:



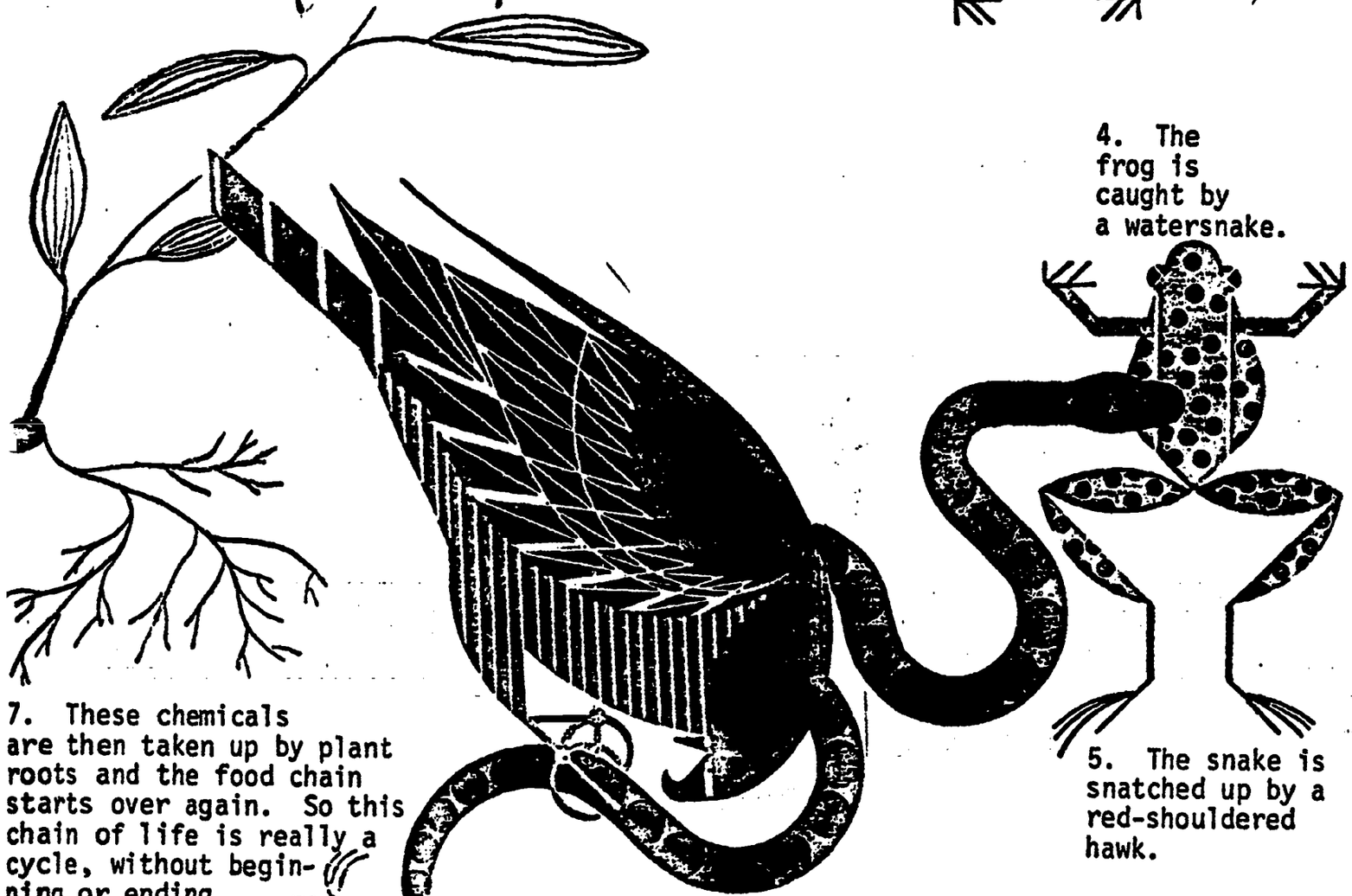
1. A butterfly sips nectar from a flower. This nectar contains the sun's energy in the form of sugars made by the plant.

2. A dragonfly eats the butterfly.



3. It, in turn, is eaten by a frog.

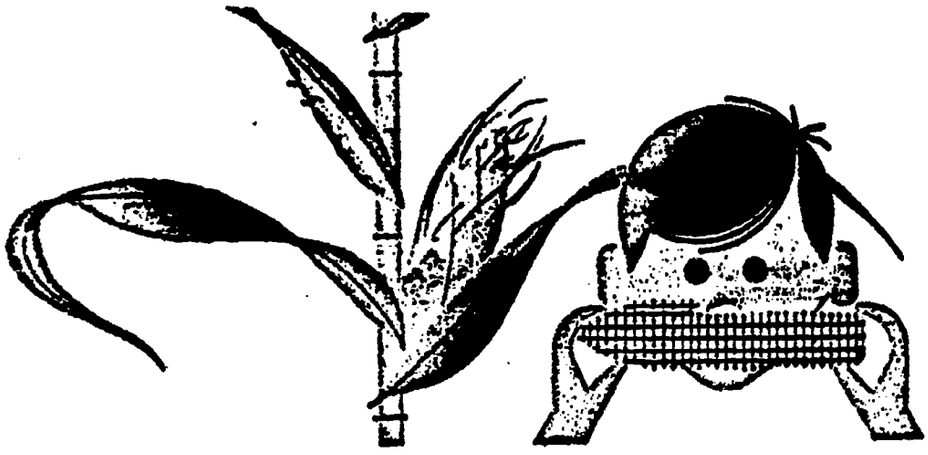
4. The frog is caught by a watersnake.



5. The snake is snatched up by a red-shouldered hawk.

6. The hawk is called the final consumer because he is the last link in the chain. There is nothing which preys on him for food while ne is alive. But after he dies, tiny organisms break down his bidy into its basic chemicals.

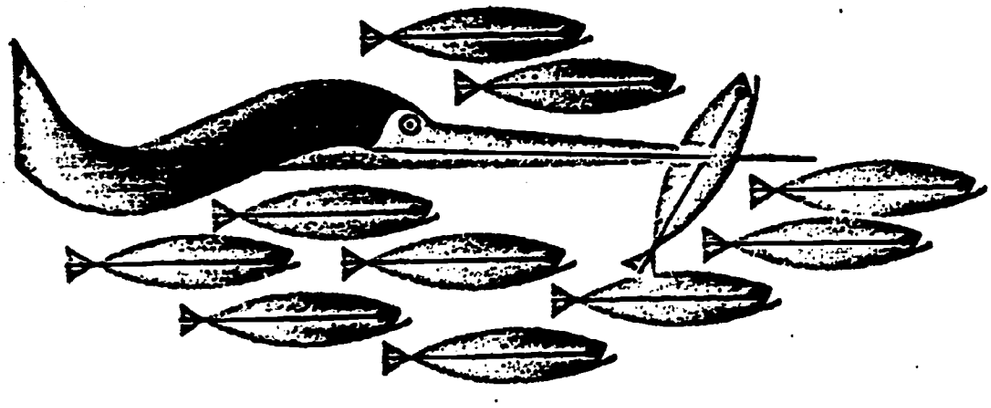
7. These chemicals are then taken up by plant roots and the food chain starts over again. So this chain of life is really a cycle, without beginning or ending.



Man is a member of many food chains. One of the simplest is plant-to-man, when the man eats vegetables.

When a man eats meat or drinks milk, he is part of a three-link chain: grass-to-cow-to-man.

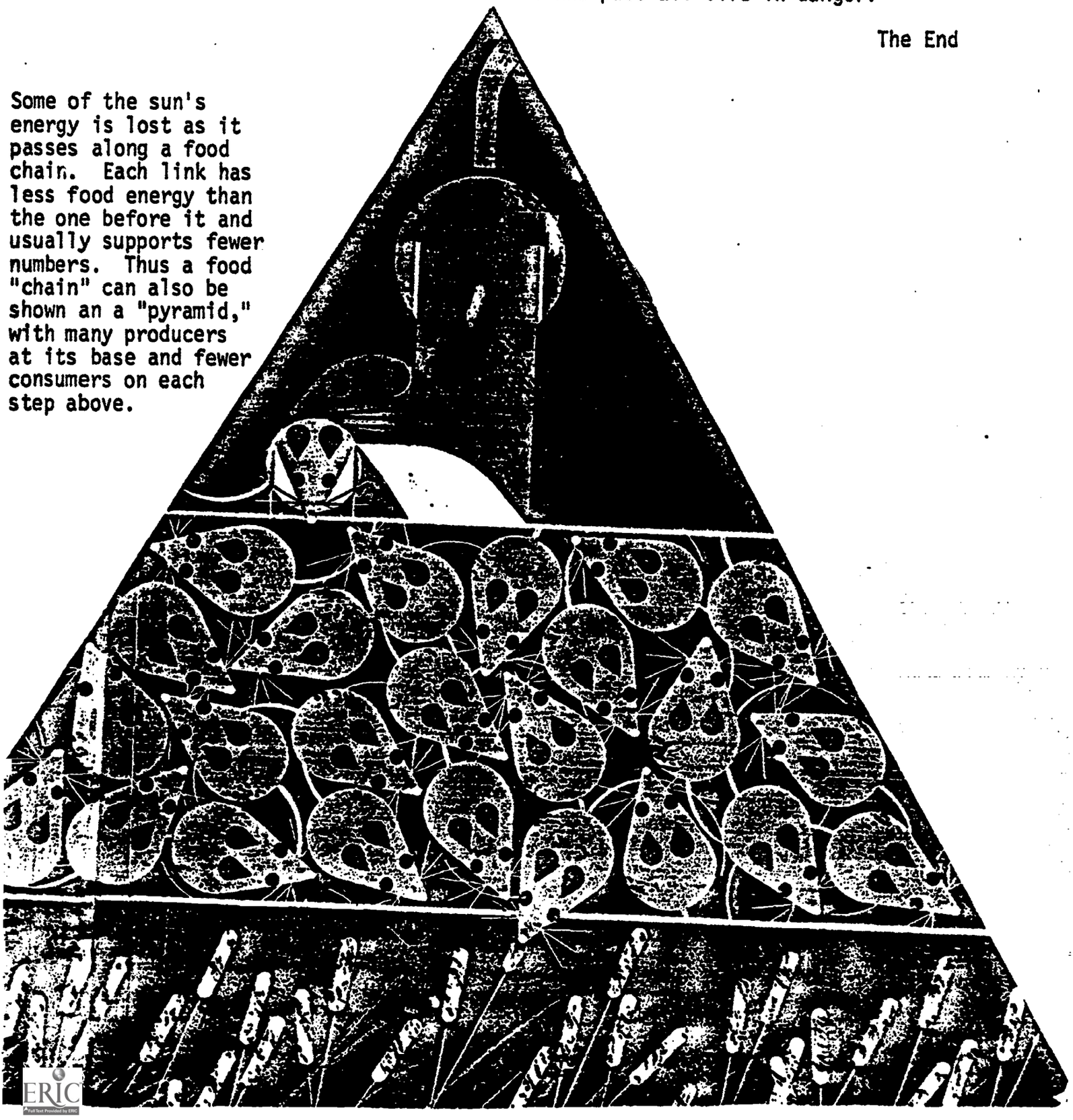
One of the marvelous things about any food chain is that it always produces enough for each of its consumers if left alone. There are more frogs and snakes and even baby hawks born than will live to become adults. Most become part of the food chain by being eaten before they grow up.



The sad fact is that man disturbs and sometimes even destroys the chains. We spill oil and dump pesticides in the ocean and kill the very basis of countless chains---the plankton. We pollute rivers, lakes and the air that mean life to all. In doing so, we may damage food chains we know little or nothing about. But this we do know: Each form of life, including man, is linked to all others. Breaking links puts all life in danger.

The End

Some of the sun's energy is lost as it passes along a food chain. Each link has less food energy than the one before it and usually supports fewer numbers. Thus a food "chain" can also be shown an a "pyramid," with many producers at its base and fewer consumers on each step above.



Using the Mini-Filmstrip: RUN FOR YOUR LIFE!

After previewing the filmstrip and the story, show the filmstrip to your pupils, and read or tell the story along with each frame. In a second showing, you might ask questions about each frame. (Suggestions appear under "Filmstrip Questions" in this Teacher's Edition).

For added enjoyment and child participation in viewing the filmstrip, you might have pupils repeat after you the underlined sentences in the following script. If necessary, you might write on the chalkboard the sentences that are to be chorused by the children.

Since there is no story printed on the filmstrip, teachers who so desire can tell the story in Spanish or any other language that meets individual needs.

Frame 2: A Worm had finished eating tiny bits of dead leaves, twigs, and soil. Then it wiggled out of a hole in the ground---where it lived. The worm wiggled across the wet, green grass. The worm was so busy wiggling that it didn't know something was coming.

Watch out, little worm. Something is coming! It is hopping closer and closer in the wet, green grass. Run, worm, run. Run for your life!

Frame 3: Watch out, little worm! Here comes a robin. It might eat you up. The robin hopped closer and closer. The worm didn't wait. It wiggled into a hole in the ground---as fast as it could. The robin just stood there---still hungry for its dinner.

Frame 4: The robin was so busy hunting for worms, it didn't know something was coming. Watch out, red robin, watch out! Something is coming! It is sneaking quietly on four furry feet. Run, robin, run. Run for your life!

Frame 5: Watch out, red robin! Here comes a cat. It might eat you up. The cat came closer and closer. The robin tweeted loudly and flew away as fast as it could. The cat ran after the robin, but could not catch it.

Frame 6: The cat was still hungry for its dinner. The cat was so busy looking for something to eat, it didn't know something was coming. Watch out, cat. Something is coming! It is racing swiftly on four busy feet. Run, cat, run. Run for your life!

Frame 7: Watch out, cat, watch out! Here comes a dog. It might bite you. The dog came closer and closer. The cat mewed and hissed before it climbed up a tree---as fast as it could. The dog ran after the cat.

Frame 8: The dog stood below the tree---barking at the cat above. The dog was so busy barking, it didn't know someone was coming. Watch out, dog, watch out. Someone is coming! He has a big stick. Run, dog, run. Run for your life!

Frame 9: Watch out, dog, watch out. Here comes a boy. He doesn't like dogs to chase cats. He might beat you up. The dog sat there---with its head hung low. "Bad dog," shouted the boy. "I told you not to chase cats. Now come home with me."

Frame 10: The dog followed the boy home. The boy went inside the house, and came back with a bone. He gave the dog the big bone to chew. Wagging its tail, the dog took the bone. "Isn't that better than chasing cats?" the boy asked.

Frame 11: Then the boy went back to the big tree. He gave a bowl of milk to the cat. He gave some seeds to the robin, and he checked to see ef the worm was safe. "Now," said the boy, "you all have food. You won't have to run for your lives while I'm here."

FILMSTRIP QUESTIONS:

Plan to show the filmstrip several times during the year, or when it relates to your curriculum. In the first or second showing (or later), you might study and discuss each frame.

Frame 1: What do you think this story is about? What do you think is in the story?

Frame 2: What animal do you see? Does it have arms or legs? How does it move? What do you think is coming?

Frame 3: Where is the worm's home? What other animals have underground homes?

Frame 4: Besides robins, what other birds have you seen? What do you think is coming? What other animals can fly?

Frame 5: Why was the robin in danger? How did it escape? What can a robin do that a cat can't? You might point out that some animals may be preditors or victims.

Frame 6: What do you think is coming? What other furry animals do you know? What other animals do you see in the filmstrip? Where do they live?

Frame 7: What is chasing the cat? To where might the cat escape?

Frame 8: How did the cat escape? Why couldn't the dog follow the cat? What other sounds can a cat make? Who do you think is coming?

Frame 9: Why is the dog afraid of the boy? The boy wouldn't hit the dog, so why is he carrying a stick? What might you gave done?

Frame 10: Who is in the picture? How do you think they feel now? How can you tell?

Frame 11: What foods are the animals eating? What else might they eat? Do you like the way the story ends? Why?

Note: For each frame, you might ask questions to help pupils discover the who, what, where, when, why, and how of the story. Have pupils anticipate, predict, and infer when such situations arise in the sequence of the filmstrip.

SUGGESTIONS AND ACTIVITIES:

If pupils are able, you might allow them (at various) times to show the filmstrip in small groups, or look at it individually.

The filmstrip can be used in making cooperative charts; rewriting the story in one-sentence paragraphs. Some pupils may want to retell the story in their own words. Others will enjoy role-playing after viewing the filmstrip.

Allow time for pupils to make a picture of their favorite character in the filmstrip. Ask pupils to make up a story of their own to go with the picture.

This filmstrip story may lead into a discussion on personal experiences involving one or more of the animals shown. Lead the discussion by asking questions involving the five outer senses. Point out each animal in the filmstrip, and discuss animal parts (wings, teeth, claws, etc.). Discover similarities and differences among the animals.

Since this filmstrip deals with animal preditors, you might help pupils discover that some of the animals are plant eaters, some are meat eaters, and some eat both plants and meat. Explain that an animal (unlike man) usually pursues another when it is hungry and needs food.

Cats catch birds, but they help them, too. A weak or sick bird is easy prey for a cat. The cat helps by attacking the sick ones which might spread disease to other birds. Cats also catch some enemies of birds.

Ask pupils what foods they have seen certain animals eat. Point out worms are good for letting air and water into soil---which helps plants to grow, and water to seep into soil.

Pupils can tell if they have seen an animal pursuing another. What happened? Discuss how different meat-eating animals help to keep a balance of nature among themselves and their environment. If birds did not eat worms, soil would be filled with worms and there wouldn't be enough food for all the worms who would die or move away. Without worms, what would happen to the soil and plants?

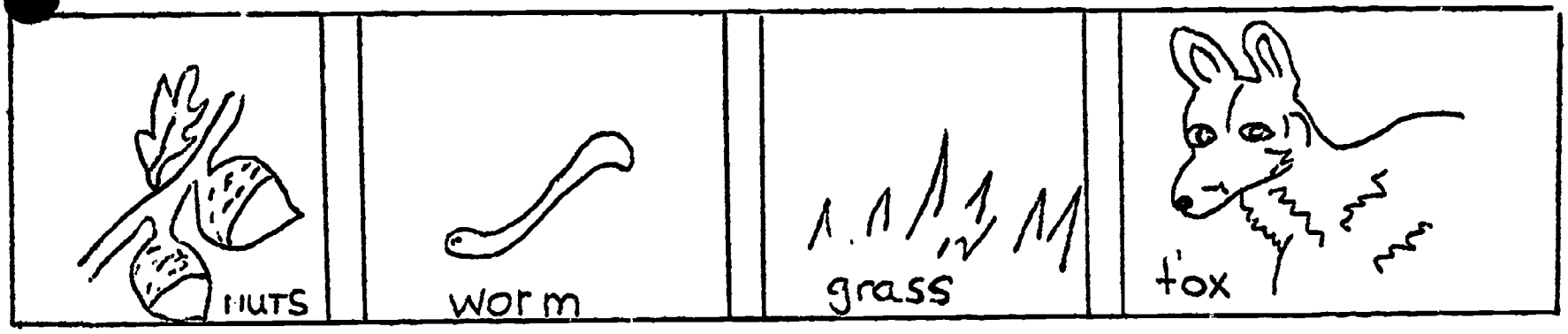
Worms eat decayed plant matter; robins eat worms, some insects, seeds, various kinds of plants, and some meats; cats drink milk, eat certain plants as well as meat and seafood; dogs drink milk, eat certain plants as well as meat and other foods.

After a rain, pupils might search for earthworms in the wet grass. Bring in a few to class and put in a jar of soft soil. Observe for a few days before returning the worms to their natural environment.

Watch for birds (a few minutes). Have pupils report what the bird(s) looks like, what it did, how it sounded, etc.

Let children tell about a cat or dog they know. Then make a class chart to show similarities and differences in color, size, etc.

IIB.



Ditto #1. Food Chains

Cut and paste as chain of food dependence. (Can use yarn as links.)

Name _____

Ditto #2.

IVC. & IVD1.

Pollution Type Air	Water	Land	Man	Place	Who or What Caused It?	Time

Name: _____ Ditto #3. VIA.

Plant Name: _____ Date planted: _____

Natural Conditions:

Date: Observations:

Experimental Conditions:

Date: Addition: Observations:

ID2.

An Arbor Day Tree

- Anonymous

Dear little tree that we plant today,
What will you be when you're old and gray?
The savings bank of the squirrel and mouse,
For the robin and wren an apartment house,
The dressing rooms of the butterfly's ball,
The locust and katydid's concert hall,
The school boy's ladder in pleasant June,
The school girl's tent in the July moon;
And my leaves shall whisper right merrily,
A tale of children who planted me.

APPLE-TREE RHYME

Here stands a good apple tree;
Stand fast at root,
Bear well at top;
Every little twig
Bear an apple big;
Every little bough
Bear an apple now;
Hats full! caps full!
Threescore sacks full!
Hullo, boys! hullo!

-OLD RHYME

IF I WERE AN APPLE

If I were an apple
  And grew on a tree,
I think I'd drop down
  On a nice boy like me.

I would't stay there
  Giving nobody joy;
I'd fall down at once
  And say, "Eat me, my boy!"

-OLD RHYME

VB.

APPLE PIE

A was once an apple pie,

Pidy,

Widy,

Tidy,

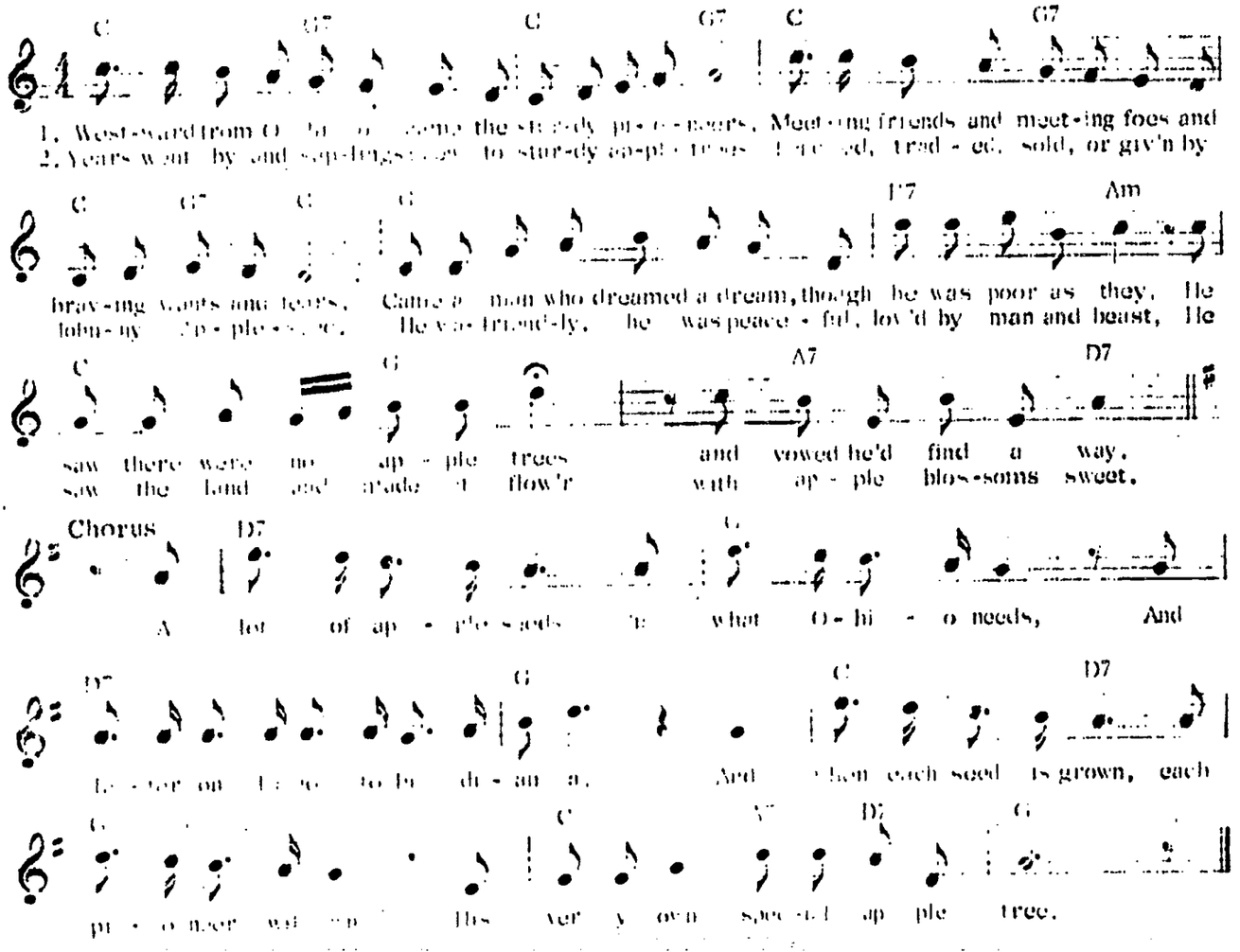
Pidy,

Nice insidy,

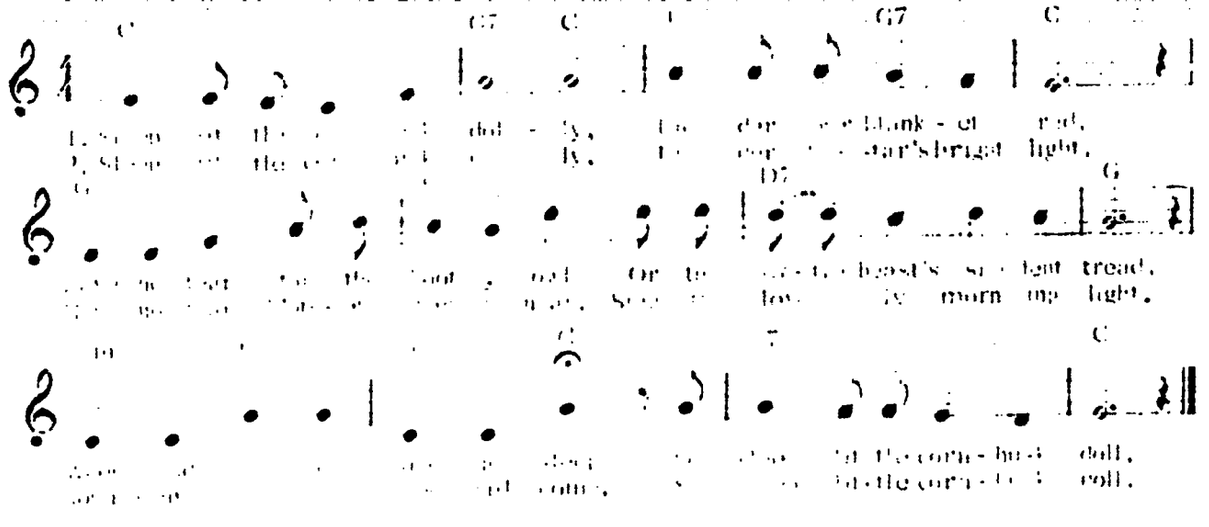
Apple pie!

-EDWARD LEAR

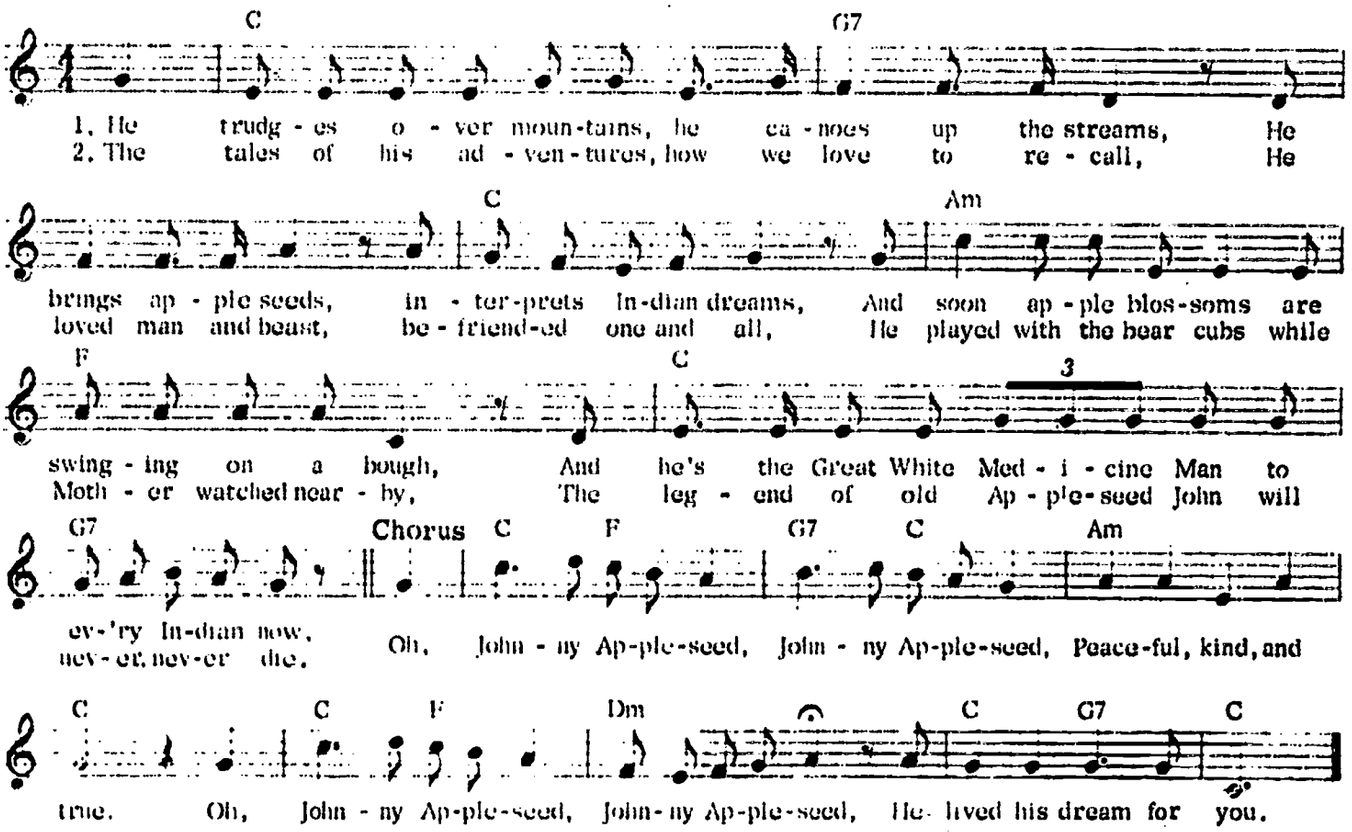
A lot of Apple Seeds



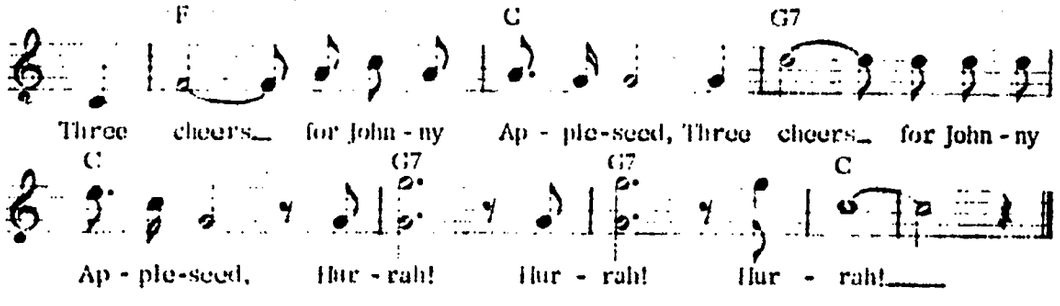
Sleep, little Cornhusk Dolly



Good friend, Johnny Appleseed



Three cheers for Johnny Appleseed



ANTIPOLLUTION SONG

Jump on the fresh-air, clean-water, unlittered bandwagon. Here's an antipollution song (to the tune of "My Bonnie") for the environmental task force in your classroom. Let group add more verses. Encourage children to pantomime to each verse.

The litter blows over our highways,
The litter blows all 'round our yard.
If only we'd look for a trash can,
Earth cleanup would not be so hard!

Pick up the trash that you see, you see.
Save tax money, save tax money, for you
and your whole family.

The bluefish lie dead in the ocean,
The codfish lie dead in the sea.
They all died of water pollution
Caused by us and some industries.

Don't swim, don't swim,
Remember the bluefish and cod, and cod,
Waste in our sea, waste in our sea.
Will kill more than bluefish and cod (poor cod!).

Thomas V. Flocco

Ecology Picture Books for Grades 1 & 2

Jeff Brigham

Particular picture books which contain environmental and ecological concepts are easily accessible to primary teachers and should be recognized as immediate means of environmental education. One concept appearing quite frequently in state environmental education guides and also in picture books stresses that animals and plants are both independent and interrelated within an ecosystem.

The following bibliography lists books which give major emphasis to three concepts--environmental symbiotic state, composition, and animal populations.

Symbiotic state refers to two different organisms living together and benefitting from this relationship.

Aruego, J.: Symbiosis, A Book Of Unusual Friendships. Scribner, 1970.

Bentley, L.: Plants that Eat Animals. McGraw-Hill, 1968.

Blough, G.: Who Lives in This Meadow? McGraw-Hill, 1961.

Buff, M.: Elf Owl. Viking, 1968.

Fisher, A.: Where Does Everyone Go? Crowell, 1961.

Freschet, B.: The Owl and the Prairie Dog. Scribner, 1969.

Friskey, M.: The True Book of Birds We Know. Childrens Press, 1954.

Garelick, M.: Where Does a Butterfly Go When It Rains? Scott, 1961.

Gay, Z.: Who Is It? Viking, 1957.

Green, M.: Everybody Has a House and Everybody Eats. Scott, 1961.

Hurd, E.: The Day the Sun Danced. Harper and Row, 1966.

Jordan, H.: Seeds by Wind and Water. Crowell, 1962.

Lathrop, D.: Follow the Brook. Macmillan, 1967.

The environment is composed of many diverse elements. Each is an integral, unique contribution to a healthy ecosystem.

Bendick, J.: Why Can't I? McGraw-Hill, 1969.

Caudill, R.: A Pocketful of Cricket. Holt, 1964.

Darby, G.: What Is a Turtle? Benefic, 1960.

Fisher, A.: We Went Looking. Crowell, 1968.

Gibson, G.: Garden Dwellers. Melmont, 1958.

Goetz, D.: Swamps. Morrow, 1961.

Hiser, I.: The Coyote. Steck-Vaughn, 1968.

Hornblow, L.: Fish do the Strangest Things. Random House, 1966.

O'Neill, M.: Hailstones and Halibut Bones. Doubleday.

Schwartz, E.: Cottontail Rabbit. Holiday House, 1957.

Animal populations are important economically, aesthetically, and biologically.

Allen, G.: Everyday Animals. Houghton Mifflin, 1961.

Brown, M.: Pip Camps Out. Golden Gate, 1966.

Buff, M.: Forest Folk. Viking, 1962.

Conklin, G.: Lucky Ladybugs. Holiday House, 1968.

Dolch, E.: Friendly Birds. Garrard, 1959.

Fisher, A.: Up, Up the Mountain. Crowell, 1968.

Gerelick, M.: What Makes a Bird a Bird? Follett, 1969.

Goudey, A.: Houses from the Sea. Scribner, 1959.

Hawes, J.: Watch Honeybees with Me. Crowell, 1964.

Hess, L.: The Curious Raccoons. Scribner, 1968.

Kumin, M.: Spring Things. Putnam, 1961.

Limmer, H.: My Kangaroo Phoebe. Hill and Wang, 1970.

Miles, B.: A Day of Summer, Knopf, 1960.

Mizumura, K.: The Way of an Ant. Crowell, 1970.

Ross, G.: What Did the Rock Say. Holiday House, 1970.

Schoenherr, J.: The Barn. Little, Brown, 1968.

Tresselt, A.: Timothy Robbins Climbs the Mountain. Lothrop, 1960.

Wildsmith, B.: Brian Wildsmith's Wild Animals. Franklin Watts, 1970.

Wong, H.: Pond Life: Watching Animals Grow Up. Addison-Wesley, 1970.

Introduce your primary class to the world of nature and help them to learn and understand the correct usage of their environment.

EAST SYRACUSE-MINOA SCHOOLS

Environmental Education Materials

Elementary Unit

Grade Three

Produced Under USOE Grant OEG-0-71-4621
by East Syracuse-Minoa Central Schools
407 Fremont Road
East Syracuse, N.Y. 13057
Dr. Fritz Hess, Superintendent

Overview of Grade Three

"There is one great conceptual scheme which encompasses all of man's relationships with his environment - the interdependence of all living things with one another and with their environment. Man, as a living thing, is, of course, a part of this grand scheme which governs life. Conservation is man's recognition of his interdependence with all of life and his environment. Lacking conservation, operating in ignorance or disregard, man has misused other living things and his environment so there now exists a growing concern for fitness for life, and fitness for living.

If conservation is the recognition of this basic concept of life on earth, then the job of education is abundantly clear. It is to provide the children in our schools and in other educational programs with an opportunity for experiences with their environment and all of life. It is to develop a culture in which man recognizes his interdependence and his responsibility for maintaining his environment in a condition fit for living."[1]

Third graders in the East Syracuse-Minoa School District need to use their senses, learn about their environment, their role in it, and most important - ways they can protect it. This unit strives to open the minds of these children to really see, hear, feel, touch, and even taste the things that are around them in their environment.

This unit is primarily concerned with air as part of the environment. Students learn about and experiment with air by utilizing their senses. Through the investigation of the effects of entering harmful smoke into their terrarium, the class discovers air pollution. Further experimentation makes the child aware of the seriousness of air pollution in the whole world.

Our final objective is that students will recognize their individual responsibilities to the problem of pollution, and will help devise a suitable plan for preventing further destruction of their environment.

---

[1] Dr. Matthew J. Brennan People and Their Environment: Teachers' Curriculum Guide to Conservation Education, J. G. Ferguson Publishing Co., Chicago, Illinois, 1969, p. 5.

FLOW CHART OF GRADE THREE

Week One

Generalizations

II. Man can learn about his environment by using the five senses.

Activities

IIA. Walk around the school yard.

IIB. Do ditto on home environment.

IIC. Color the picture of school environment.

Week Two

Generalizations

II. Man can learn about his environment by using the five senses.

Activities

IID. Measure objects in classroom.

IIE. Illustrate poems on senses.

IIF. Construct mobiles of their environment.

IIG. Develop an environmental alphabet.

IIH. Categorize objects with environment found in.

Week Three

Generalizations

II. Man can learn about his environment by using the five senses.

III. Air is part of man's environment.

Activities

II I. Do word puzzles.

IIJ. Define environment.

IIIA. I-4. Do experiments with air.

Flow Chart of Grade Three

Week Four

Generalizations

I. Living things are interdependent with one another and with their environment.

Activities

IA1. Construct 2 identical terrariums.

IA2. Pollute one terrarium with cigarette.

IA3. Make a chart comparing the 2 terrariums.

Week Five

Generalizations

I. Living things are interdependent with one another and with their environment.

IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Activities

IB. Observe the terrariums.

IVA. Develop a definition of air pollution.

IVB. Do car exhaust experiment.

Week Six

Generalizations

I. Living things are interdependent with one another and with their environment.

IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Activities

IB. Observe the terrariums.

IVC. Make a collage of air pollution.

IVD. Have school custodian talk about school's contribution, if any, to air pollution of area.

IVE. Decide whether homes contribute to air pollution.

IVF. Collect articles about air pollution from local newspapers.

Flow Chart of Grade Three

Week Seven

Generalizations

I. Living things are interdependent with one another and with their environment.

V. In order to preserve our threatened environment, present attitudes must change to reflect widespread public concern which will encourage protective action by individuals, groups, and governments.

Activities

IB. Observe the terrariums.

VA. Write a class letter to local company.

VB. Plan and organize a positive air pollution project.

Week Eight

Generalizations

V. In order to preserve our threatened environment, present attitudes must change to reflect widespread public concern which will encourage protective action by individuals, groups, and governments.

Activities

VC. Write their own poems about their environment.

Grade Three Generalization: II. Man can learn about his environment by using the five senses.

Objectives	Activities and Strategies	Materials	Evaluation
IIA. After a class walk around the school grounds, the students will develop charts of the following: 1. things seen 2. things heard 3. things smelled 4. things touched.	IIA1. Divide the class into 4 groups: The Eyes, The Ears, The Noses, The Fingers. Walk around the school yard. Have each group write down all the things that fit in their category.	IIA1. Pencil and paper.	IIA1. a. The Eyes houses, cars, streets. b. The Ears dogs barking, doors closing, car engines. c. The Noses freshly mowed grass, smoke from a nearby factory, car and truck eshaust. d. The Fingers cool grass, smooth sidewalk, rough tree bark.
	IIA2. Use the papers the group wrote to develop a chart for each sense.	IIA2. Chart paper and marker.	IIA2. A chart should be developed for each of the 4 groups.

Grade Three Generalization: II. Man can learn about his environment by using the five senses.

Objectives	Activities and Strategies	Materials	Evaluation
IIB. Having developed charts for their outside environment, the students will complete a ditto for their home environment.	IIB. "Now that we've developed charts for our outside environment, let's see what you can do with a ditto about your home environment."	IIB. Ditto #1 contained in appendix, and pencils.	IIB. Students can complete the ditto with at least 5 things for each sense.
IIC. Given a picture of a school environment, the students will color the picture using the key.	IIC. Discuss their school environment as observed by their senses. Give them the picture of a school environment. Notice what you talked about. Have the class color the picture.	IIC. Ditto #2 contained in appendix and crayon.	IIC. Students can complete the ditto correctly.
IID. Using the school environment, the students will measure some of the objects in the classroom with other objects in the classroom.	IID. Have the student measure the classroom, e.g. How many paper clips long is your desk? wide is your desk? How many paper clips tall are you? How many pencils long is your reading book? How many chalk pieces long is the teacher's desk?	IID. Paper clips, erasers, pencils, index cards, chalk, books, desks, students.	IID. The students can measure the objects correctly.
IIE. Given the poems on the senses, the students will relate the poems to their awareness of the environment.	IIE. Have students read and discuss poem on the senses.	IIE. Poems found in the appendix.	IIE. Students can read and discuss the poems on the senses as they relate to their environment, also, they may draw a picture to go with one of their poems.

Grade Three Generalization: II. Man can learn about his environment by using the five senses.

Objectives	Activities and Strategies	Materials	Evaluation
IIF. After class discussion and given the necessary materials, the students will be able to construct mobiles of things they see, hear, feel, taste, and/or smell in their environment.	IIF. Have each child, or groups of two or three students make a mobile of drawing and/or pictures pertaining to things they see, hear, feel, taste, and/or smell in their environment.	IIF. String, hangers, sticks, pictures or drawings, scissors, and imagination!	IIF. Mobile is constructed.
IIG. As a result of all the above activities, the class will develop an environmental alphabet.	IIG. Ask students to write the alphabet letters down the left hand side of their paper (teacher will do so on board). Next to each letter, we are to write something found in our environment beginning with that letter. See if you can develop an alphabet for each of the five senses.	IIG. Paper, pencils, alphabet letters, and intelligence!	IIG. Charts will be made for each sense. i.e. <u>seeing</u> a-ants b-birds c-cans d-desks Each chart may be illustrated.
IIH. Given a ditto of objects in the environment, students will categorize the objects as to school environment, home environment, and outside environment.	IIH. Give the students a ditto which contains a random selection of objects found in his environments. Students will cut the words and paste them on another ditto which is divided into home, school and outside environments.	IIH. 2 dittoes, scissors, paste.	IIH. Completed chart.
II. I. Given a word puzzle, the students will follow the directions, and then make puzzles of their own, using the objects in their environment for their classmates to do.	II. I. Give the students dittos of the word puzzle to do. Students are then instructed to create word puzzles of their own. Teacher can give each student a ditto master to write, or type it on.	II. I. Word puzzle located in the appendix; pencils; dittoes; and typewriter (optional).	II. I. Students have created word puzzles using words of objects in their environments.

Grade Three Generalization: II. Man can learn about his environment by using the five senses.
III. Air is part of man's environment.

Objectives	Activities and Strategies	Materials	Evaluation
II.I. As a result of the previous activities, the class will develop a definition of the word, environment.	II. I. Have the class define environment.		II. I. Class definition of environment.
IIIA. Following these experiments, the class will identify one part of the environment: air, using at least 3 senses.	IIIA1. Use Activitiy 1 and/or 2, 3, 4. Have each child blow up a balloon. Slowly let air out, letting him feel air escaping and hear air escaping.	IIIA1. Balloons for each child, hot air.	IIIA1. Child says balloon is filled with air. He can feel air escaping. He can hear air escaping.
	IIA2. Have someone open a vacuum packed can. "What makes the noise?" Let class eat goodies.	IIIA2. Vacuum packed cans of goodies (enough for class), can opener.	IIIA2. "Air!"
	IIA3a. Put water in the tin can. Put the open can on the hot plate. When steam appears, cap the can tightly. Put it in cold water. What happens? We have removed all the air from the can.	IIA3a. Tin can with a screw top, small am't of water, hot plate.	IIIA3a. Can collapses
	IIIA3b. Drop burning piece of paper into the bottle. Quickly place egg, pointed end down, in the mouth of the bottle. What happened? Why?	IIIA3b. Hard boiled egg without the shell, glass bottle thats	IIIA3b. Egg goes into the bottle.

Grade Three Generalization: III. Air is part of man's environment.

Objectives	Activities and Strategies	Materials	Evaluation
	To get the egg out, turn the bottle upside down. Let the egg rest, pointed end down, in the neck of the bottle. Blow hard into the bottle and watch out!	mouth is slightly smaller than the egg, piece of paper, and a match.	IIIA3b. Egg comes out!
	IIIA4. Fill a basin or tub with water. Have the students immerse different containers in the water. Have them observe bubbles. Why are there bubbles? Stuff the container with paper. Immerse upside down into water. Why doesn't paper get wet?	IIIA4. Containers and basin of water.	IIIA4. Air is escaping. Air is present.

IIIA. Riddle used with this Activity

Sometimes it is full of rain
Sometimes it is full of snow,
Sometimes it is moving
And makes the sailboats go.
It is most important for people,
For plants and animals, too.
It is right here in our schoolroom
And all around you!
(This may be memorized; may be set to music and sung.
Air, of course, is the answer.)

Grade Three Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IA. Given 2 identical terrariums, one as a control and one with polluted air, the students will construct a chart listing differences between the 2 terrariums.	IA1. Do crossword puzzle in appendix.		
	IA2. Construct 2 identical terrariums. Next to each plant place a popsicle stick for measurement.	IA2. 2 glass gallon containers, moist soil, plants, small animals, popsicle sticks, cigarettes.	
	IA3. Leave one terrarium alone. Into the other terrarium, place an ashtray with a lighted cigarette each day.		
	IA4. Make a chart comparing each terrarium including answers to these questions: a. Do plants grow at the same rate in both terrariums? b. Does it rain as much? c. Is the odor of the plants the same? d. Do the animals act the same? e. Do both terrariums look the same? f. Do the terrariums smell the same? (End of each week)		

IA4.

Control TERRARIUM				
Questions	3/10	3/17	3/24	3/31
a) PLANT Growth				
b) RAIN				
c) PLANT Smell				
d) ANIMAL Actions				
e) Looks				
f) Smell				

Grade Three Generalization: I. Living things are interdependent with one another and with their environment.
IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
IB. Given 3 week observations of the 2 terrariums, the students will conclude the second terrarium has evidence of air pollution.	IB. "We've watched the terrariums. What has happened? What makes the difference between the two terrariums?"		IB. Student response: "One terrarium has been polluted. It's air has been polluted."
IVA. Given their experience with the terrariums, the students will develop a definition for air pollution including seeing and smelling.	IVA. What is air pollution? What senses tell you the air is polluted?		IVA. Class defines air pollution as the alteration of life limiting its usefulness. Air pollution can be seen and smelled.
IVB. Having developed a working definition of air pollution, the students will test pollution caused by car exhausts.	IVB. Car Exhausts: Use waxed paper coated with petroleum jelly to test the exhausts from various vehicles. Hold the paper three to four inches (the same distance each time for one minute) from the exhaust pipe of a car whose motor is running. The teacher could start various cars in the parking lot or permission could be obtained to test vehicles at a gas station.	IVB. Petroleum jelly, waxed paper, parking lot full of cars.	IVB. Answer to the question: Which teacher's car causes the most pollution?

Grade Three Generalization: IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
	NOTE: Be sure to notify the driver of the vehicle before making tests, for safety reasons. Pupils should also be cautioned regarding the inhaling of carbon monoxide. Label the collection papers as to the approximate year of car, make of car, type of vehicle, size of engine, i.e. 4, 6, or 8 cylinder (bus, truck, diesel, etc.) Compare the results as to the dirtiest, largest amount, size of particles, number of substances, etc. Relate this information to the type, age, fuel used, etc. of the vehicles tested. (EEIA)		
IVC. Having been given an example of air pollution, the students will construct a collage of air pollution.	IVC. Construct a collage using pictures of air pollution.	IVC. Magazine pictures, paste, paper.	IVC. Collage of air pollution.
IVD. Given their school heating plant as an example, the class will decide whether the school contributes to air pollution of the area.	IVD. Invite a school administrator and the head custodian to speak to your class on air pollution as it pertains to the effluent of the school's heating plant. Try to arrange a tour of the heating plant area in the school.		IVD. Class will decide whether the school contributes to air pollution of the area.

Grade Three Generalization: IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
	Does the school heating plant contribute directly to air pollution? Are any anti-pollution devices being used? What are they? What type of fuel is used by the school? Do the school buses contribute to air pollution? What attempts are being made to curb it? How does the school dispose of its solid wastes? Does this contribute to air pollution? What, if anything, is being done to cut down on air pollution resulting from school wastes? (EEIA)		
IVE. Given their home environment, the students will decide whether their homes contribute to air pollution in the area.	IVE. Go home and check to see if your home contributes to air pollution in the area.		IVE. Students will decide whether their homes contribute to air pollution within the area.

Grade Three Generalization: IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

V. In order to preserve our threatened environment, present attitudes must change to reflect widespread public concern which will encourage protective action by individuals, groups, and governments.

Objectives	Activities and Strategies	Materials	Evaluation
IVF. Given their area newspapers, the students will collect articles relating to air pollution and classify them as either defining the problem or solving the problem.	IVF. Look in your newspaper for articles about air pollution. We will have 2 columns, one that talks about air pollution problems, the other that talks about ways of solving the problem.	IVF. Area newpaper articles.	IVF. Articles divided in 2 columns. Air Pollution Problems | Solving the Problems
VA. Given the local environment, the class will write a letter to a local company asking about their efforts in averting air pollution;	VA1. Write a class letter to a local company asking what they're doing to avert air pollution. Make sure the class has been exposed to the correct form to write a business letter. VA2. After receiving a reply to their letter, the class will decide if the company is trying to avert air pollution.		VA. A class letter written in correct business form to a local company asking what they're doing to avert air pollution.
VB. As a result of this unit, the class will develop positive air pollution preventive activities.	VB1. Class should plan and organize activities to prevent air pollution. VB2 What kinds of things could you do now to prevent a world full of air pollution?	VB. Class develops a list of materials necessary.	VB. Class plans and organizes these activities.

Grade Three Generalization: V. In order to preserve our threatened environment, present attitudes must change to reflect widespread public concern which will encourage protective action by individuals, groups, and governments.

Objectives	Activities and Strategies	Materials	Evaluation
VC. Having studied haiku and cinquain types of poetry, the student will create his own poems based on his awareness of his environment through his senses.	VC. Have the class write their own poems about their environment.	VC. Instructions for writing poem forms included in the appendix.	VC. Students' poems.

APPENDIX

Grade Three Ditto #1

HOME ENVIRONMENT

THE EYES THE EARS THE NOSES THE FINGERS

Grade Three

Ditto #2

3 + 2	7-5
5 X 2	2 + 4
2 X 2	2 + 5
7 + 3	3 + 3
20 - 15	7 - 2
7 - 7	4 + 3
3 X 3	6 + 2

0 = Black
1 = Blue
2 = Red
3 = Purple
4 = Green
5 = Yellow
6 = Orange
7 = Brown
8 = Pink
9 = White
10 = Gray

This is an example of a ditto of your classroom environment.

OUR FIVE SENSES

STILLNESS

What is stillness?
Do you know?
The quiet after
Falling snow.

A silent stone
Sedate and gray,
Sitting alone
Day after day.

A water lily
White and cool,
Floating on
A lily pool.

And I myself
Behind a chair
With Mother looking
Everywhere.

- Jean Brabham McKinney

WONDERFUL WORLD

I can see
Trees and grass,
The sun and sky;

I can taste
Chocolate ice cream,
Apple pie;

I can smell
Perfume, flowers,
Baking bread;

I can touch
Silk and velvet,
A baby's skin;

What a wonderful
World I'm in!

- Eva Grant

OUT WALKING

When you go for a walk,
What do you see?
A bird?
A butterfly?
A bee?

When you go for a walk,
What do you see?
A bush?
A sparkling stone?
A tree?

When you go for a walk,
Waht do you see?
A laughing child?
A friend?
Me?

- Leland B. Jacobs

HONEYCOMB

We see the hives in summertime,
  Hear the murmuring of its bees,
And watch the tireless workers
  In flowers and in trees.

And then we rob the silent hives
  When bees' hard work is done,
So we may taste in wintertime
  Sweet summer on the tongue.

- Roy Z. Kemp

TASTE OF PURPLE

Grapes hang purple
In their bunches,
Ready for
September lunches.
Gather them, no
Minutes wasting;
Purple is
Delicious tasting.

- Leland B. Jacobs

THINGS TO TOUCH

Some things are so warm to touch,
  Like blankets in the sun,
Horses pulling heavy loads,
  A fresh-baked sugar bun.

Some things are so cool to touch,
  Like pebbles in a stream,
The marble on a table top,
  A dish of peach ice cream.

Some things are so smooth to touch,
  Like worn pews in a church,
Inside a mossy acorn cup,
  A bark-peeled stick of birch.

Some things are so soft to touch,
  Like snow, my cozy bed,
But best of all, my grandma's hand
  That gently strokes my head.

- Camilla Walch Knox

SWIFT THINGS ARE BEAUTIFUL

Swift things are beautiful:
Swallows and deer,
And lightning that falls
Bright-veined and clear,
Rivers and meteors,
Wind in the wheat,
The strong-withered horse,
The runner's sure feet.

And slow things are beautiful:
The closing of day,
The pause of the wave
That curves downward to spray,
The ember that crumbles,
The opening flower,
And the ox that moves on
In the quiet of power.

- Elizabeth Coatsworth

KITCHEN SMELLS

I like the smells
The kitchen makes,
When my mother
Cooks and bakes.

Yummy rolls...
(I watch them rise)
Chocolate cakes,
Blueberry pies.

Broiled chickens,
Roasts a-roasting,
Crunchy cookies
Lightly toasting.

- Jean Brabham McKinney

All the words in the list can be found among the letters below. The words can be read forward, backward, up, down, or diagonally. Circle the words when you find them.

ANTS, BEES, BIRDS, BUGS
ANIMALS, DESERTS, DIRT,
FLOWER, SEED, GRASS, LAND,
MOTH, PLANTS, REPTILES,
SNAKES, TREES, WATER.

A B D R T R E E S E F
N R B E E S P G N G L
I E T I C T U Q S D O
M P S M R B A F T E W
A T S D K D L W N S E
L I A N I J S H A E R
S L R I A R L O L R D
T E G R U K T A P T E
N S M O T H E O N S E
A S R E D I P S I D S

IA1.

Grade 3

CROSSWORD

POT-LUCK TERRARIUM

by Julie Johnson

Just before (I3 DOWN)___comes, go outside with a (4 DOWN)__and a (2 ACROSS)___. Fill the bottom of the terrarium with about two inches of (I0 ACROSS)___,(9 DOWN) ___and (1 DOWN)___. You can go into the (6 DOWN)__or just out to your own (5 ACROSS)___under a (3 ACROSS)___tree.

Carefully (11 ACROSS)___around a block of soil about an inch deep and smaller than your terrarium. Be very careful not to break the soil block as you lift it into your terrarium.

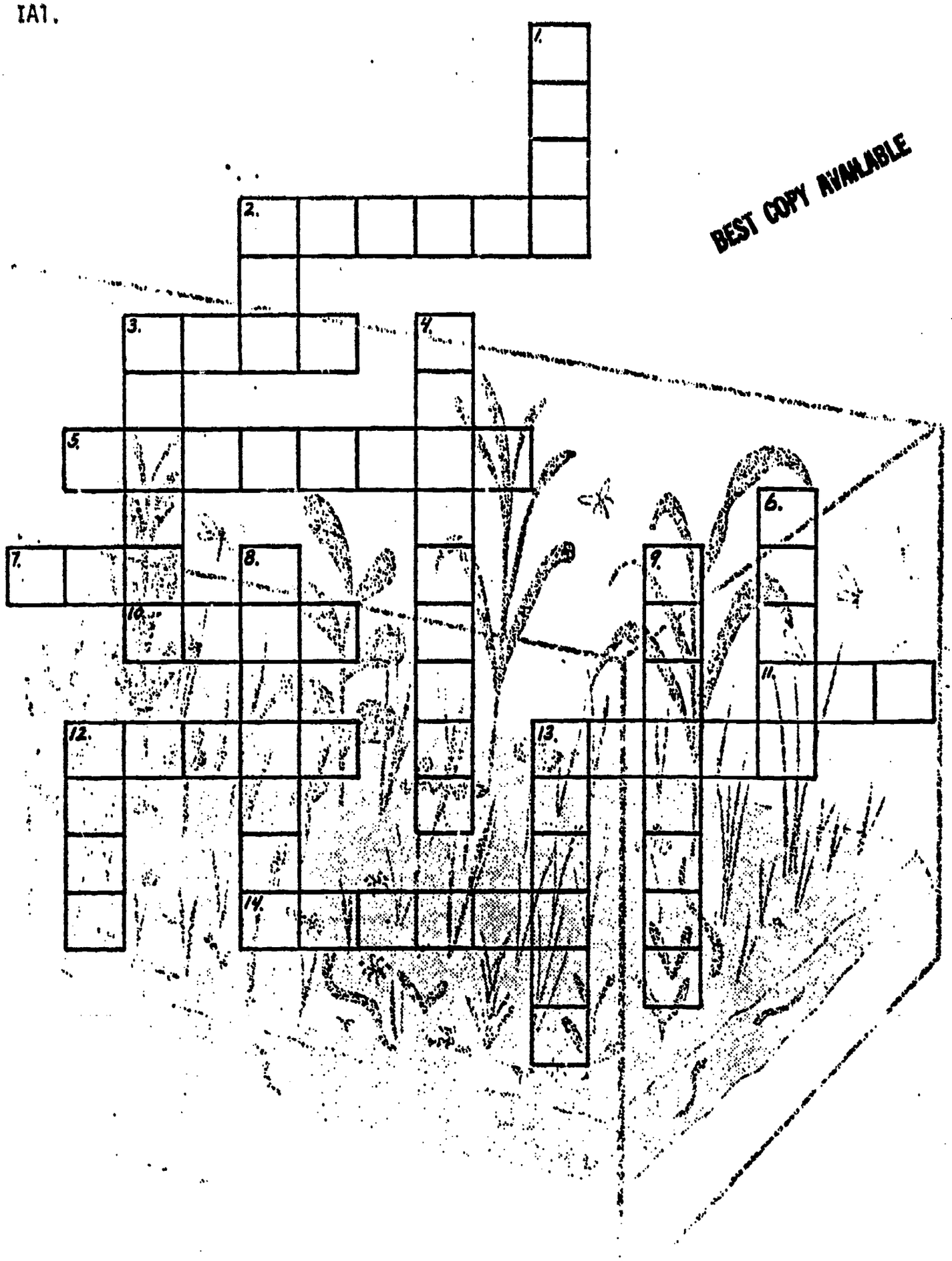
Take your terrarium inside and place in a (I2 DOWN)__spot and sprinkle the earth with (I2 ACROSS)___from time to time. Be sure to place a (7 ACROSS)___ or loosely woven piece of muslin securely over the terrarium top.

In time, all sorts of (3 DOWN)___will (I4 ACROSS)__and soon will begin to grow. Be on the lookout for (I3 ACROSS)___, too, and all sorts of (8 DOWN)__which will come to the top of the soil. Sprinkle often and place in the (2 DOWN)___ from time to time. You may want to let the flying insects go, but keep the worms, for they will till the soil.

LIST OF WORDS

BACKYARD	PLANTS	SOIL
CHARCOAL	SAND	SPROUT
DIG	SHOVEL	SUN
INSECTS	WINTER	TERRARIUM
NET	WOODS	WARM
PINE	WORMS	WATER

IA1.



IA1.

FOR TEACHERS' USE ONLY:

ANSWERS

ACROSS		DOWN	
2.	SHOVEL	I.	SOIL
3.	PINE	2.	SUN
5.	BACKYARD	3.	PLANTS
7.	NET	4.	TERRARIUM
Io.	SAND	6.	WOODS
II.	DIG	8.	INSECTS
I2.	WATER	9.	CHARCOAL
I3.	WORMS	I2.	WARM
I4.	SPROUT	I3.	WINTER

The following poetic forms may be used with third graders to write poems with environmental themes. The first two forms, cinquain and haiku, may be used in conjunction with drill on syllabication.

Cinquain -

Preconceived attitudes...

CINQUAIN

Frazier R. Cheyney

Preconceived attitudes concerning poetry, on the part of both children and teachers, often create a real stumbling block in writing verse. One way to eliminate this stumbling block is through teaching an old yet little known form--the cinquain.

The first part of the word cinquain means the number five, in French and Spanish. This refers to the fact that cinquain poetry has five lines.

It also is a syllabic, rather than rhyming, form of poetry. The syllables in each line are as follows:

Line 1 -- 2 syllables

Line 2 -- 4 syllables

Line 3 -- 6 syllables

Line 4 -- 8 syllables

Line 5 -- 2 syllables

Each line also has a specific purpose or meaning, as:

Line 1 states the title.

Line 2 describes the title.

Line 3 expresses an action.

Line 4 expresses a feeling.

Line 5 indicates another word for the title.

By applying these rules, a cinquain poem such as this may be produced:

Roses

Red and pretty

Bending with the cool breeze

Yet roses are a gift of love

Flowers

- Mike

Children should not begin writing too quickly. After introducing the rules, show a few examples of cinquain verse and guide the class in writing a group poem. Develop the idea that cinquain poetry attempts to reflect the inner feelings of the author. The creative poems the children write will astound you.

Haiku -

Oriental haiku verse has many variants in our American English language, but such a verse form causes young children to become much more conversant with the world around them. True haiku has a syllabic pattern of 5, 7, 5 syllables and does not have to be rhymed. After pupils have listened to several verses of haiku poetry created by other haiku authors, they usually get the style and express themselves beautifully. In some cases the syllabic pattern is altered; however, feeling, mood, and tone are more significant than the correct number of syllables to a line. This verse was created by a third grader in California:

A tiny flower (5)

Digs into the dark brown earth, (7)

A spark of sun comes (5)

The flower digs down deeper. (7)

This child has kept the traditional 5, 7, 5 pattern of a haiku verse but has capped it with a concluding line of seven syllables.

Noun verses - This form is excellent for practice in using parts of speech and for developing creative expressions of environmental awareness.

The pattern is as follows:

1. Select a noun.
2. Write two words which describe the noun or answer the question, "What kind?"
3. Write three words which tell an action performed by the noun.
4. Write 4 words which show feelings about the noun.
5. Find a synonym for the noun.

example:

Fire

Bright, burning,

Flickers, flames, destroys,

Hot, dangerous, scared, bad

Inferno

EAST SYRACUSE-MINOA SCHOOLS

Environmental Education Materials

Elementary Unit

Grade Four

Produced Under USOE Grant OEG-0-71-4621
by East Syracuse-Minoa Central Schools
407 Fremont Road
East Syracuse, N.Y. 13057
Dr. Fritz Hess, Superintendent

Overview of Grade Four

"Children instinctively relate to nature; help them to understand it! Presenting the wonders, lessons, and mysteries of the environment to children is vital to the future of Mother Earth. It's also fun. Children enjoy it because it connects with their daily experiences and wildest dreams".[1]

This theme is an integral part of this fourth grade unit. The teacher must remember that the environment is everywhere! It is not just majestic forests, babbling streams, and Blue whales. Millions of students have no immediate access to such natural settings. Therefore, this unit has been designed to focus on the environment of those students who are studying it --that of the East Syracuse-Minoa area.

While dealing primarily with water and water environments, the activities in this unit are devised in such a way as to stress the interdependence of all elements in the environment. Furthermore, many important general concepts have been intricately incorporated into inquiry - oriented, experience activities.

.This unit has been purposely and carefully developed in an interdisciplinary nature. We feel that it is vitally important for the success of environmental education that students realize that awareness of and respect for Mother Earth does not cease with the end of science class. Instead it extends into all facets of their school program and of their lives. Therefore, we feel that it would be wise not to separate activities into language arts, science, math, social studies, etc. Let the student experience the totality of environmental education.

Finally, we believe that students should learn the realism of the pollution issues we are facing, however, not as the "doomsday" stories that are being told. We have tried to develop their sense of responsibility, and above all, to encourage them to enlist on the positive side of conservation. There are, of course, no instant answers; but we hope that each child may derive from this study an awareness of his environment, and a desire to preserve that environment.

---

[1] Walter J. Hickel Instructor Magazine "Worlds Around Us" June/July 1972

FLOWCHART OF GRADE FOUR

Week One

Generalizations

I. Living things are interdependent wiht one another and with their environment.

II. Living things depend upon the non-living part of their environment.

III. Natural Resources, in terms of quantity and quality, are important to all living things. As population increases, competition for use of these resources increases, resulting in a need for establishing priorities.

Activities

IA. Construct a web of interdependence.

IIIA. Write letters to OCWA and N.Y.S. Dept. of Health.

IIA. Make collage of water.

IIB. Make list of water environments.

Week Two

Generalizations

II. Living things depend upon the non-living part of their environment.

Activities

IIC. Develop checksheet of animal life around water.

IID. Take field trip to Erie Canal.

IIE. Make an aquarium.

IIF1. Observe the aquarium and draw pictures of water life.

Week Three

Generalizations

II. Living things depend upon the non-living part of their environment.

Activities

IIF.2. Make oral reports.

IIG. Make observations of aquarium.

IIH. Display students' water samples.

FLOWCHART OF GRADE FOUR

Week Four

Generalizations

I. Living things are interdependent with one another and with their environment.

Activities

IB. Construct a web of interdependence of water life.

IC. Do thermometer experiment.

Week Five

Generalizations

III. Natural Resources, in terms of quantity and quality, are important to all living things. As population increases, competition for use of these resources increases, resulting in a need for establishing priorities.

Activities

IIIB-C. Demonstrate 2 methods of purifying water.

IIID. Make bulletin board of uses of water.

Week Six

Generalizations

IV. Pollution can be defined as the alteration of the environment, through the activities man, in such a manner that the environment becomes limited in its usefulness.

Activities

IVA. Do detergent experiment.

IVB. Write story about world with just polluted water.

Week Seven

Generalizations

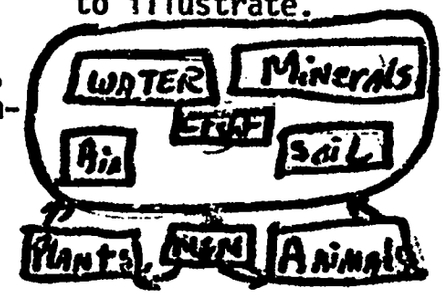
V. In order to preserve our threatened environment, present attitudes must change to reflect widespread public conern by individuals, groups and governemtns.

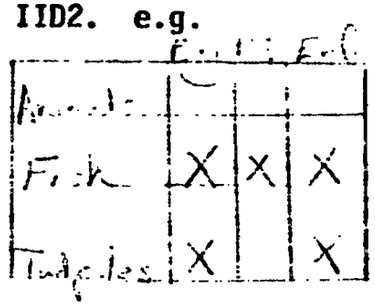
Activities

VB. Plan positive water pollution preventive activity.

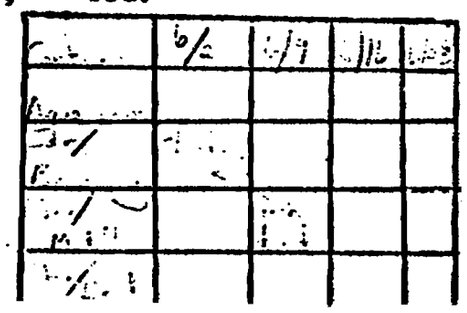
Grade Four Generalizations: I. Living things are interdependent with one another and with their environment.

III. Natural resources, in terms of both quantity and quality, are important to all living things. As population increases, competition for use of these resources increases, resulting in a need for establishing priorities.

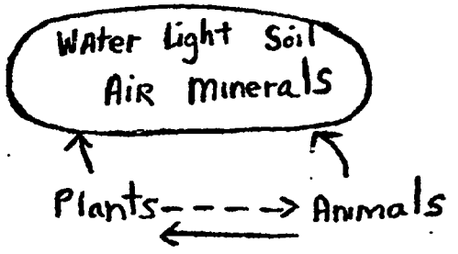
Objectives	Activities and Strategies	Materials	Evaluation
IA. Given 8 elements (water, air, light, soil, minerals, plants, animals, man) and a class discussion, the students will construct a web of interdependence using all 8 elements.	IA. Write the 8 elements on the board. Take the elements, one at a time, plants, animals and man. Ask how all the other elements relate to that element. After the discussion, a web of interdependence should have been constructed on the board.	IA. Marker, pictures from magazines or childrens' drawings, cards with names of 8 elements.	IA. Using web of interdependence on board, class will construct a bulletin board of the web. May want to use pictures from magazines or childrens' drawings to illustrate.
		Collect magazines, 10 clear quart containers, 6 small nets, and permission slips.	
IIIA1. Given water that they drink, the class will find out how it is purified.	IIIA1a. Teacher will instruct as how to write a correct business form letter. Two letters written simultaneously IIIA1b. Class will write letter asking Onondaga County Water Authority for information about methods of water purification used on the water we drink.	IIIA1. Address: Onondaga County Water Authority Main Office Town Line Road corner of Malden Road.	IIIA. Letter to OCWA using correct business form.
IIIA2. After reading The Story of Water Supply, the students will be able to compute how much water their family uses a day.	IIIA2. Class will write letter asking for individual student copies of The Story of Water Supply distributed by N.T.S. Dept. of Health, Albany, N.Y. 12208. Read p.15 "How to Read Your Water Meter." From the house watermeter, each student will record readings at the same time two days in a row. Teachers might want to compute how much water school uses for a day.	IIIA2. New York State Department of Health, Albany, New York 12208.	IIIA2. Student computation.

Objectives	Activities and Strategies	Materials	Evaluation
IID1. On a field trip to Erie Canal (North Burdick Street going east to Limestone Creek Aqueduct)--- or any other water environment---assigned students will collect 6 samples of water life, i.e. at the beginning of walk, about midway through walk, and at end of walk.	IID1. Assign 2 students for each jar and net. Talk to assigned students about placing jar in canal carefully. Hold the jar in the water in order to collect some "animal life" in the jar (tadpoles, small fish). Once they've collected some life in their jar, put the top on. Label the jar, using tape and a pencil.	IID1. Students wearing sneakers & old clothes, 6 jars, masking tape, pencils, 6 small nets, and checksheets.	IID1. 6 jars labeled: Beginning Middle End
IID2. On a field trip to Erie Canal, or any other water environment, the students not collecting water samples, will observe the animals life around the water using the checksheet the class developed.	IID2. Have the rest of the class use their checksheets to note animal life found around the water.		IID2. e.g.  Teacher must return with 90% class dry!

Grade Four Generalizations: II. Living things depend upon the non-living part of their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IIE. Taking 3 of the water samples: (I from beg. I from middle, I from end), make an aquarium of water life.	IIE1. Do the crossword puzzle in the appendix on How to Make an Aquarium. IIE2. 3 of jars of water life put together in an aquarium. Observation of life and temperature should be done simultaneously.	IIE2. An aquarium and 3 jars of canal water life samples.	IIE. An aquarium of Erie Canal water life using I jar from beginning of trail, I jar from middle of trail, and I jar from end of trail.
IIF. Given the group of containers being observed, the class will: .. Observe the water life & draw pictures of that life.	IIF1. Encourage the class to watch the life in the containers. Have the students draw pictures of the animal life they see. Have the students label the pictures. If they don't know the name of the animal, have the class name the animal or its movements. Teachers should try not to tell the class the names of the animals.	IIF1. Aquarium drawing paper, pencils and crayons.	IIF1. Class pictures with labels.
2. Read a book about water life.	IIF 2. Students should be encouraged to read a book about one of the water creatures they have observed and present it orally to the class.	IIF2. Library books about animals found around water.	IIF2. Oral book reports by class on water creatures.
IIG. Using the aquarium & the 3 other jars of collected life, the class will observe noting any change.	IIG. Have the class observe the water life. Note any changes on a weekly chart. Display chart near water life containers.	IIG. Chart paper, ruler, & marker.	IIG. 

Grade Four Generalizations: II. Living things depend upon the non-living part of their environment.
I. Living things are interdependent with one antoher and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IIH. To observe different water environments, students will be encouraged to display examples of water life they have found.	IIH1. Use the list of water environments they compiled. Encourage the students to bring in their own water samples. Add these samples to classroom collection; observe. IIH2. After students have labeled the jars, add the name to groups of containers being observed.	IIH1. Student samples, masking tape, and pencils.	IIH1. Students will label sample jars with the name and where it was found. IIH2. Students will observe differences in contents of sample jars, if any.
IB. After observing the water life, the class will construct a web of interdependence of water life.	IB1. Does the web of interdependence already constructed fit the water life observed? How?	IB. Web of interdependence already constructed, chart paper and marker.	IB1. Yes! IB2 
IC1. Given 3 thermometers, a jar of clear water, a jar of collected water, the class will record temperature on a chart for the period of at least a week.	IC1. Take 3 small identical thermometers. Place one on counter, one in jar of clear water, one in jar of collected water. Record the readings on each of 3 thermometers at the same time every day for one week or more.	IC1. 3 small thermometers, 1 jar of clear water, 1 jar of canal water, chartpaper and marker.	IC1. Chart

Date	Thermometer	Thermometer (clean water)	Thermometer (collected water)
Monday 8:30AM	72°	70°	73°
Tuesday 8:30 AM			
Wednes. 8:30			

Grade Four Generalizations: I: Living things are interdependent with one another and with their environment.
III: Natural resources in terms of both quantity and quality, are important to all living things. As population increases, competition for use of these resources increases, resulting in a need for establishing priorities.

Objectives	Activities and Strategies	Materials	Evaluation
IC2. Given the chart of recorded temperatures, the students will predict what causes temperature changes: a. glass and water b. plants and animals.	IC2. Look at your chart. Are the temperatures the same? What (if anything) do you think makes the temperatures different?	IC2. Chart of temperatures.	IC2. Class predicts cause of changes in temperature.
IIIB. Given a hypothetical situation, the class will decide they can't use canal water for drinking.	IIIB. On a camping trip near the canal, would you drink the water from the canal?		IIIB. No! If someone says yes, ask if he might get sick.
IIIC. Given water that they can't drink, the class will purify the water for drinking.	IIIC1. Teacher demonstrates: Add 10 drops of clorox to 1 gallon of water. Shake it up and let it sit for 1/2 hour. IIIC2. Read article Water and Life by Gerald Schneider to find other treatments of water.	IIIC1. Water, clorox, closed container for water. IIIC2. The article is located in the appendix.	IIIC. After the teacher demonstrates this method of water purification, the students will also do it.
IIID. Having determined the amount of water used daily, the class will determine the ways water is used.	IIID. Develop a list of ways water is used in your home. Cut out or draw pictures illustrating uses of water. Make sure someone mentions washing clothes!	IIID. Magazine pictures or childrens' drawings.	IIID. Use picture for bulletin board on the uses of wate

Grade Four Generalizations

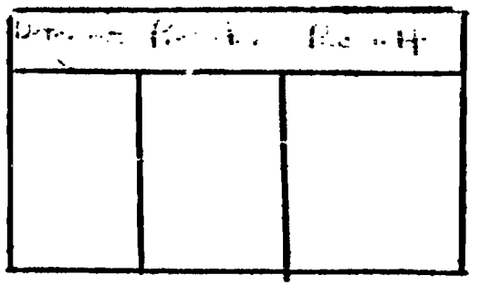
IV. Pollution can be defined as the alteration of the environment, through the activities of man, in such a manner that the environment becomes limited in its usefulness.

Objectives	Activities and Strategies	Materials	Evaluation
IVA. Students will hypothesize what happens when detergents are added to their water samples.	IVA1. "We're going to do an experiment with your water samples. We're going to see what happens when detergents are added to water samples." "Let's find out which 5 detergents are used most often. How can we find out which 5 detergents are most popular?" Determine which 5 detergents are most popular.	IVA1. Paper, pencil, chart.	IVA1. Accept any reasonable way e.g. a survey which includes 5 neighborhook families per child (remember who you asked in survey in order to give them the results).
	IVA2. "What do you think will happen when we add the detergents to the water samples?"	IVA2. Ditto master.	IVA2. Accept any reasonable answer. Ditto for each child's prediction about changes in jars plant & animal life.

Grade Four Generalizations:

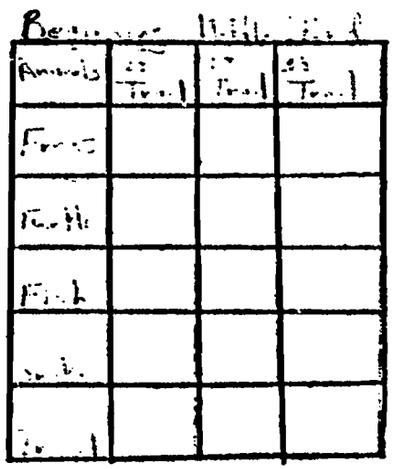
IV: Pollution can be defined as the alteration of the environment, through the activities of man, is such a manner that the environment becomes limited in its usefulness.

V: In order to preserve our threatened environment, present attitudes must change to reflect widespread public concern which will encourage protective action by individuals, groups and governments.

Objectives	Activities and Strategies	Materials	Evaluation
	IVA3. Use 5 jars of water samples. Add I teaspoon of a different detergent to each jar each week for several weeks. What happens in the water samples? If a biodegradable detergent is not included in the experiment, make a 6th sample using one. What happens in the 6th water sample?	IVA3. 5 jars of water samples, samples of 5 most populat detergents and teaspoon.	IVA3. 
IVB. As the result of the activities in the unit, the class can hypothesize what a world with just polluted water could be like.	IVB. We experimented with water life. Would it be easier to treat the water for drinking now? Why or why not? What do we call water that is unsafe for most living things? What would the world be like with just polluted water? Write a story about a world with just polluted water. What would you see (plants, animals, water life). What would you taste? Smell? What would need to be done to the water before you used it? (drinking, bathing, washing your clothes).	IVB. Writing paper.	IVB. Story written by class using correct language arts skills.
V. As a result of writing the story, the class will develop a positive water pollution preventive activity.	V. The class should plan and organize activity to prevent water pollution. What kinds of things could you do now to prevent a world of just polluted water from ever happening?	V. Class develops materials needed if any.	V. An activity the class plans and organizes.

Grade Four Generalizations: II. Living things depend upon the non-living part of their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IIA. To develop an awareness of water, students can make a collage using pictures from magazines.	IIA. Have the class collect pictures of different water environments. Use all the pictures to construct a collage. Have each student put at least one picture on the collage. Title it - Water.	IIA. Magazine pictures, a large sheet of paper, paste or staples, marker.	IIA. The collage!
IIB. Having developed a collage of different water environments, the students will name some water environments they know.	IIB1. "We made a collage of different kinds of water life. Where have you found water environments?" "What kinds of life did you find there that you don't find here at school?"	IIB1. Chartpaper and a marker.	IIB1. A list of water environments.
	IIB2. Students will do research project as to the history of the Erie Canal.	IIB2. Encyclopedia or books on history of Erie Canal.	IIB2. Paper on Erie Canal history utilizing correct language arts skills (paragraphing, sent. struct., spelling, & punct.).
IIC. In preparation for field trip to Erie Canal, the students will develop a checksheet of animal life found around water.	IIC1. After discussing the kinds of life found around water, make a list of animals found around water. "We're going on a field trip to a water environment. We'll need a way to deep track of all the animals we'll see." Class should develop some kind of checksheet to be taken on the field trip. Have the class wear old clothes and sneakers. IIC2. Have the class learn the words to the Erie Canal song. This can be sung on the way to the field trip.	IIC. Writing paper, rulers and pencils.	IIC. Checklist of animal life found around water, e.g.



by Gerald Schneider

WATER AND LIFE. You and everyone else and all other animals and all plants are mostly water. Life as you know it would be impossible if you did not have water to drink. You require at least 5 pints a day. A horse needs about 15 gallons a day. How much water does your pet dog, cat or bird drink?

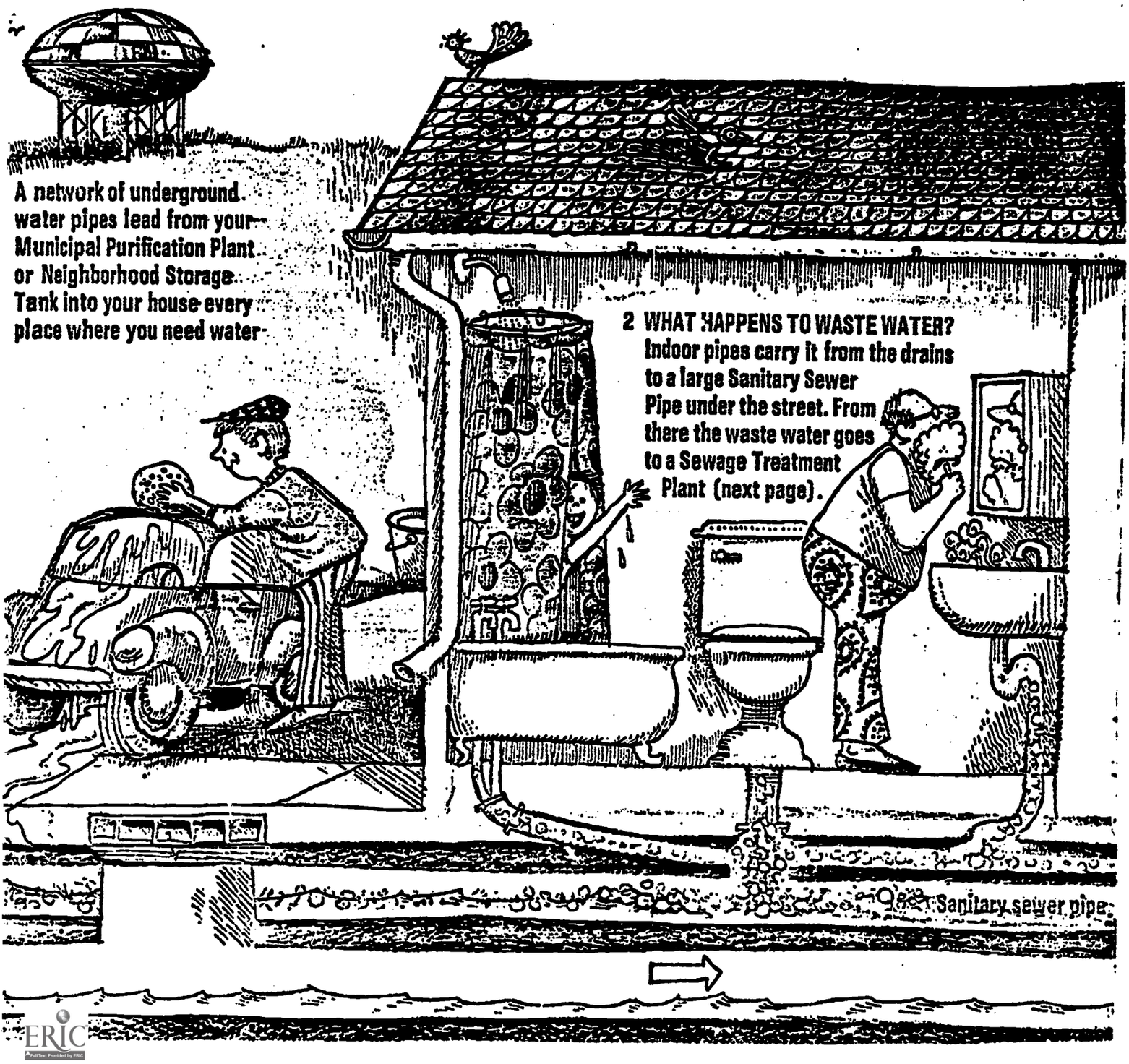
Your own body is 65 percent water. Discover for yourself something about the amount of water in plants and animals. Cut some thin slices of potato, cucumber or some other fresh vegetable. Weigh the slices on a small scale and record the weight. Then put

Drawings by
John Huehnergarth

the slices near a sunny window to dry. Reweigh them when they are dry. The difference between the first and second weights is the amount of water lost. Can you figure out what percentage of the vegetable was water? Do the same with a dead worm.

WATER IN YOUR HOME. Besides keeping you alive, water has important uses in your home. It cleans your body as well as dishes, clothes, floors and cars. Air conditioners remove water vapor from the air to cool houses. Sprinklers spray it on lawns to keep them green. Wastes are flushed with water through pipes and sewers. All in all you probably use about 70 gallons of water a day at your house. How many gallons do you use in a month, a year? How would you like to carry that much water from a well?

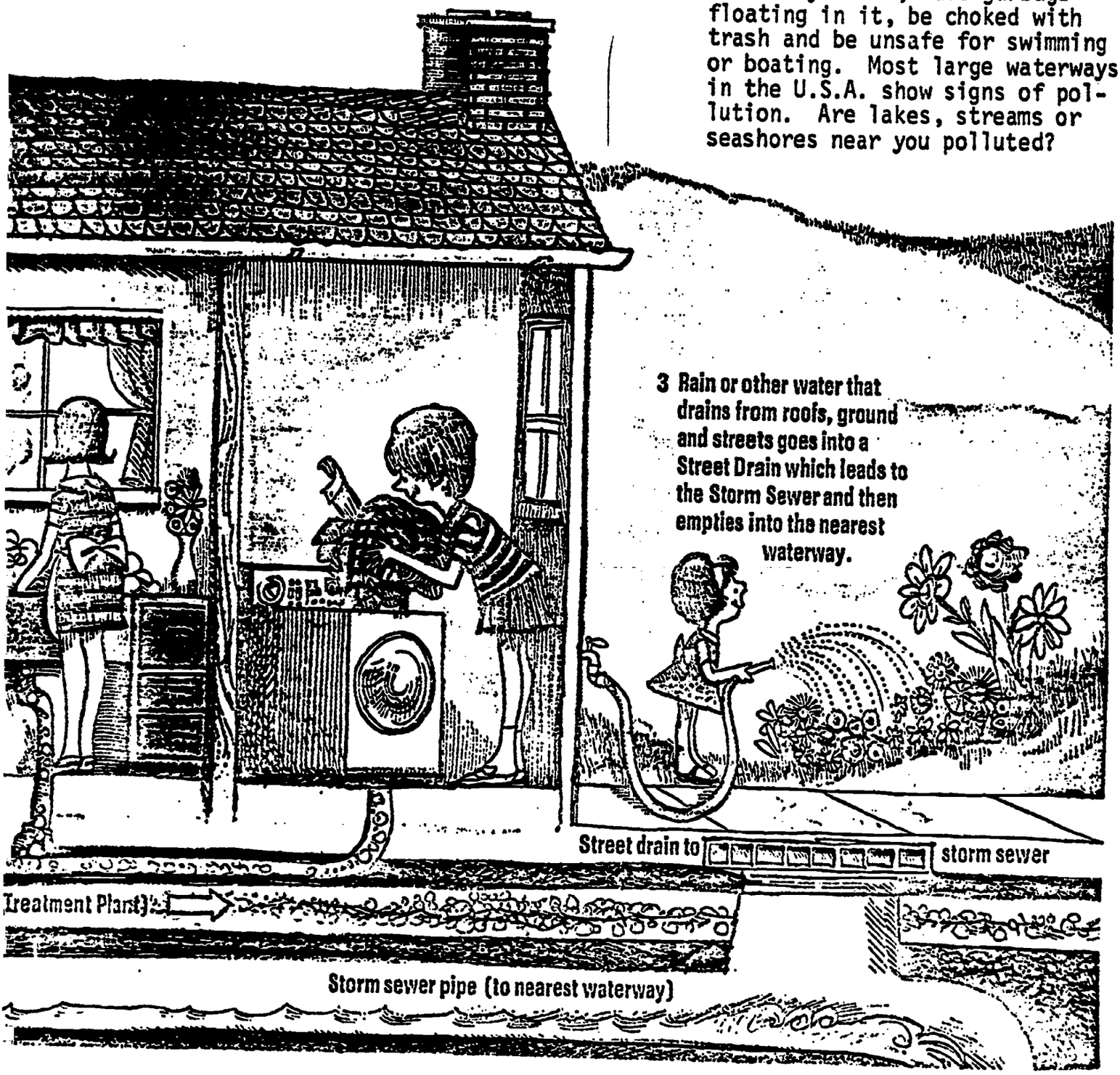
WATER AT WORK. As many as 65,000 gallons of water are used to make one ton of steel, and almost that many to make a ton of paper. Oil refineries use about 6 gallons of water for every gallon of gasoline they produce. Hydroelectric dams use water to turn the turbines that make electricity for millions of people.



Oceans and rivers are watery routes for ships carrying people and goods around the world. Oceans, lakes, ponds, swamps, marshes, rivers and streams are homes for wildlife. They are also places where people may enjoy swimming, fishing, boating and many other kinds of outdoor recreation.

Water helps to shape the landscape by washing away (eroding) rock and soil. Such erosion can create a magnificent place like the Grand Canyon or wash away valuable topsoil from farms. Piped to dry places, water permits crops to grow. This is called irrigation. Too much water---a flood---can destroy buildings, bridges and highways. Too little water---a drought---can destroy people, wildlife, and crops.

WATER POLLUTION. Water is polluted when it is unsafe to use, largely because of sewage and wastes dumped into it. Polluted water may smell, have garbage floating in it, be choked with trash and be unsafe for swimming or boating. Most large waterways in the U.S.A. show signs of pollution. Are lakes, streams or seashores near you polluted?



Some years ago makers of detergents developed laundry aids that would work well even in hard water. This seemed like a great idea to housewives. But---slowly at first and then faster---rivers and streams and lakes piled up with suds. The detergent makers had not realized that the chemicals they added to the laundry products could not be broken down by bacterial action as regular soaps can. They had to find different chemicals that could be more easily broken down.

Now the mountains of suds are rapidly disappearing, but other chemicals called phosphates are still present in detergents. Phosphates are great plant food. They cause the tiny green algae that grow in water to multiply and clog our waterways. Soon the green mats of water plants turn dark and smell as they die. Bacteria in the water can break down a certain amount of dead algae, but they cannot handle these huge amounts.

That is only part of the problem. There are phosphates found in wastes from industry, and phosphates are an important part of the chemical fertilizers that help farmers grow better crops. When more fertilizer is used than the plants can take in, large amounts wash off the soil into our waterways. This is another example of something that seems good (making the soil produce more food) but has bad side effects that no one foresaw.

WATER TREATMENT BEFORE USING. What happens to the water that is piped into your home depends on where your town gets it. If it is pumped from a deep underground well it is probably pure enough to be pumped to neighborhood storage tanks and from there to homes, stores and factories. If the water comes from a lake or river it must be treated at a municipal purification plant. Why not vivit the one in your community?

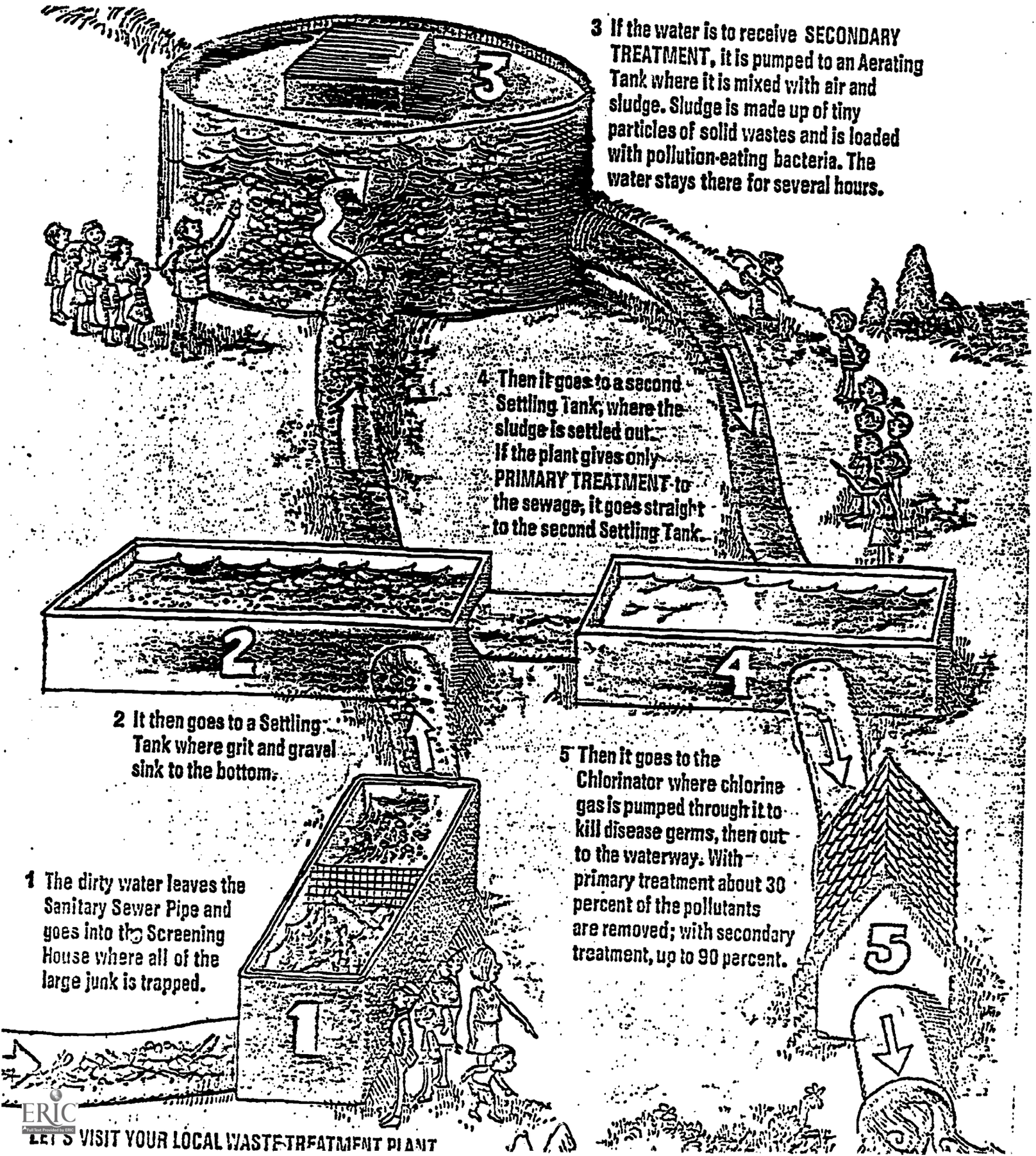
WATER TREATMENT AFTER USING. Once upon a time, when there were fewer users of water, the wastes went from buildings to a network of sewer pipes under the streets and into a big pipe that emptied them back into the waterways. There was enough clean water there to dilute the wastes. Then nature's self-cleaning processes could take over. Bacteria and other microscopic plants and animals in the water could break down the wastes into harmless substances.

Nowadays most communities give off too much waste material for nature to handle alone. The dirty water must be cleaned BEFORE it goes back to the waterways. Has your community a waste treatment plant?

The picture on page 32 shows how waste water can be given two stages of treatment called primary and secondary. These remove many of the pollutants. Some that remain may be destroyed in waterways. But some of the chemicals are not removed.

Tertiary, or third-stage, ways of treating water are being tested. These too will be needed as population grows and factories and power plants produce new forms of pollutants, including radioactive wastes.

People everywhere will have to know more about ways of treating waste water so they can tell whether the local methods are good enough. To learn more, send 55 cents to the Superintendent of Documents, U.S. Gov't. Printing Office, Washington, D.C. 20402 for A Primer on Waste Water Treatment.



WHAT CAN YOU DO?

Notice the ways you use water around your home. How much water is used to wash the family car? Get a watch with a second hand. Time how long it takes to fill a one-gallon bucket with water from a hose. Use the same hose pressure that is used when the car is being washed. Now time how long the hose runs while the car is being washed. What was the number of gallons used? You can see why it is a good idea, in dry seasons, to use water in a bucket to wash cars instead of running it from a hose.

Water is too valuable to be wasted. Even a leaky faucet losing one drop of water each second wastes 4 gallons of water a day. Be careful to close faucets tightly.

Here are some other ways to save household water and you can probably think of many more:

Don't let the water keep running continuously from the faucet while washing dishes or brushing your teeth. Don't run water just to get a cool drink. Instead, keep a container of water handy in the refrigerator. Sprinkle lawns and gardens in the early morning or evening. Less water is lost at these times. Heat from sunlight causes water to change to water vapor and rise into the air (evaporation). During the daylight plants lose water vapor into the air around the plants (transpiration). A good way to see this is to tie a clear, plastic bag around a small leafy branch. What happens inside?

Now that you know much more about water---its uses and misuses---how many ways can you think of to use water more carefully?

You might start a project at school to find out whether your community is polluting its waters. See what steps are being taken to stop it. See if you can get your parents, neighbors and teachers to help solve pollution problems.

SEWAGE TREATMENT. Obtain a dime-store flour sifter or make a container with a screen bottom. Cover the screening with a layer of absorbent cotton, next a I-inch layer of fine sand, a I-inch layer of coarse sand, and then a I-inch layer of gravel. Set the sifter over a jar and slowly pour muddy water into it. Does the water look clean when it comes out the bottom? While the water may look clean, it still contains germs and should not be drunk! Compare what you did in this experiment with the way sewage or wastes are treated in regular treatment plants.

TASTE. Pure water is tasteless and is not often found in nature. Water gets its taste from minerals and oxygen in the air that are mixed in with water. Test to see the difference in taste between water with air in it, and water that is flat, or has little air in it. Boil a cup of water to force out the air. Taste some of it when it cools. Note the taste. Now pour the remaining water back and forth ten times from one cup to another. Taste the mixed water. Any difference?

SMELL. Collect separate fresh cups of water from a faucet, a swimming pool and a pond or lake. Smell each quickly. Do they smell different? How do you explain your observation?

"HARDNESS." Water is said to be hard when it contains large amounts of minerals such as calcium and magnesium. Look for signs of hard water around your home, such as a bathtub ring, spots on glassware, a whitish deposit on pans, red or brown stains on clothes, soap scum on wash water. Hard water can cause your hair to look dull and matted too. Knowing the signs of hardness, can you make up a test to tell if the water in your house is hard? Are there chemicals that will make hard water "soft" (free of hard minerals)? THE END

CROSSWORD...

How to Make an Aquarium

by Julie Johnson

As children complete this puzzle, they will be motivated to follow the directions to develop a classroom aquarium.

Duplicate the puzzle and a sheet on which Words to Choose from and Directions for Making an Aquarium are printed.

Directions for Making an Aquarium

(6 Across)___and (I0 Across)___should be placed at the bottom of the (I2 Down)___, about several inches deep.

Place the (8 Across)___or water plants in the sand, but only a few. Some aquatic plants are: (7 Across)___, (2 Down)___, and (9 Down)___.

Fill the tank with (I3 Across)___to within several inches from the top.

The basic role of the aquatic plants is to replace (4 Across)___in the water.

Several different kinds of tropical fish that can be used, are: (3 Down)___ fish, (I Down)___fish and (8 Down)___fish.

The (II Across)___helps to make the walls of the tank cleaner and the and the water clearer.

Snails live in (6 Down)___which help to cecorate the aquarium.

Fish (2 Across)___should be given to the fish once a day.

Tropical fish like to race around the tank and swim in and out of (5 Down)___.

WORDS TO CHOOSE FROM

Angel

Arrow Head

Aquatic

Castles

Fanwort

Food

Gold

Moon

Oxygen

Pebbles

Sand

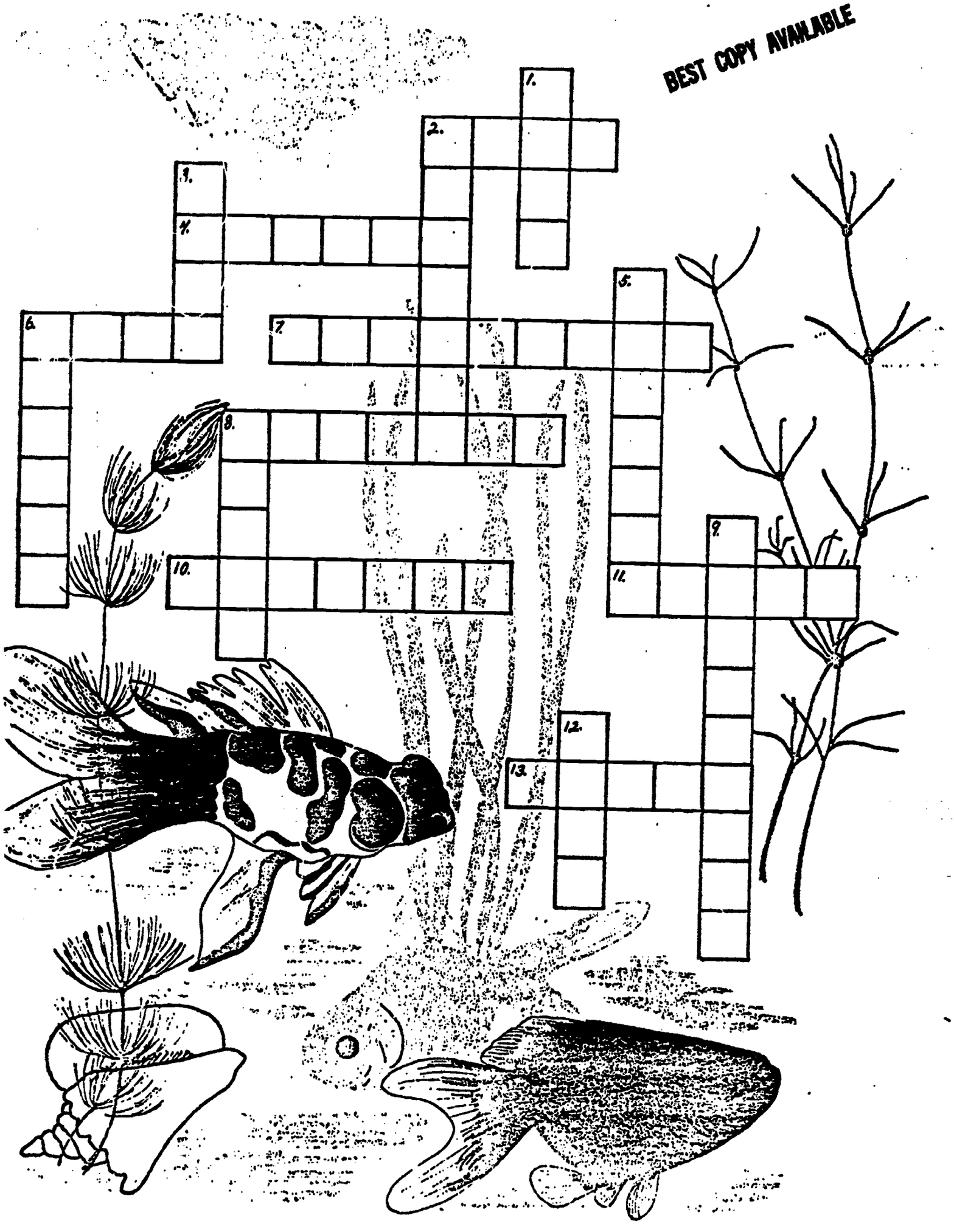
Shells

Snail

Tank

Tape Grass

Water



FOR TEACHERS ONLY:

ANSWERS

ACROSS

2. FOOD
4. OXYGEN
6. SAND
7. ARROW HEAD
8. AQUATIC
10. PEBBLES
11. SNAIL
13. WATER

DOWN

1. MOON
2. FANWORT
3. GOLD
5. CASTLES
6. SHELLS
8. ANGEL
9. TAPE GRASS
12. TANK

EAST SYRACUSE-MINOA SCHOOLS

Environmental Education Materials

Elementary Unit

Grade Five

Produced Under USOE Grant OEG-0-71-4621
by East Syracuse-Minoa Central Schools
407 Fremont Road
East Syracuse, N.Y. 13057
Dr. Fritz Hess, Superintendent

Overview of Grade Five

Through expanding technology and misuse of natural resources, man threatens to destroy the biosphere. This environment includes the total life support system.

The purpose of this unit is designed to encourage the child into a commitment and envolvement. We must bring about an understanding of the child's social world: his home, community, nation, and the world. We must help the child develop new in real-life situations. We must help the child develop new insight into conservation problems. Hopefully, the child will develop into an adult who is able to make intelligent decisions in regard to the use of natural resources.

Thus, the plan of this unit is concerned with the wisest multiple use of renewable resources, preservation of priceless and irreplaceable natural resources and solutions for these problems. The strategy is that of basic inquiry: statement of problem, needed materials, collection of data, observation, and logical conclusions.

Goals:

1. To give the child reason to try to improve his environment.
2. To help the child understand the interdependency and interrelationship of the environment and his part in this web.
3. To give awareness for optimum benefits to come about, cooperation must be practiced between national organizations and individuals.

Keep an open mind and create an atmosphere for genuine "brain storming. Do not seek only "right" answers. Give the child room to develop his hypothesis as he gathers up new data.

The objectives may be set up with several activities. This is to give room for reinforcement. Selection should be made according to the needs of your particular students. Hopefully, this guide is designed as such to give room for the creative teacher to inject his/her own ideas.

Flow Chart for Grade Five

Week One

Generalizations

I. Living things are interdependent with one another and with their environment.

Activities

I.A. Take walk on school grounds.

IB-E. Do seed experiments.

Week Two

Generalizations

I. Living things are interdependent with one another and with their environment.

Activities

IF. Do soil profile.

IG. Do seed experiment.

IH. Set up terrariums.

Week Three

Generalizations

I. Living things are interdependent with one another and with their environment.

Activities

I. I. Construct food chain and food web.

I. K. Make a list of uses of various products.

Flow Chart for Grade Five

Week Four	Week Five	Week Six
Generalizations	**Generalizations**	**Generalizations**
II. Natural resources are our most precious possessions.	IV. Some parts of the natural environment are either difficult to replace or are in fact irreplaceable.	V. Man would do well to observe nature's example and recycle the results of his technology.
III. Soil is a natural resource.		VI. Man's efforts at changing the environment to fulfill his needs are beneficial to him but harmful to the environment.
Activities	**Activities**	**Activities**
IIA. Trace product back to raw materials.	IVA. Write a report about replacement of mineral resources.	VA. Derive a working definition of recyclement.
IIB. Introduce substitutes for minerals.	IVB. Derive a working definition of erosion by water.	VIA. Make value judgment about a controversial environmental issue.
IIIA. Discuss soil as a natural resource.	IVC. Discuss various types of erosion.	

Week Seven

Generalizations

VI. Man's efforts at changing the environment to fulfill his needs are beneficial to hime but harmful to the environment.

Activities

VIB. Present play, What Ever Happened to Mother Nature.

Grade Five Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Strategies and Activities	Materials	Evaluation
IA. Given a collection of plants, the student will observe the plants and conclude that green plants need the right conditions for growth and survival - soil, water, sunlight.	IA. Take class to weed patch. (Teacher will have made previous plans) After looking at the weeds, ask students to pull a plant. Observe student who pulls up an entire plant: root, stem, and leaves. (If no child pulls a complete plant, the teacher should). Take a plant to the classroom for further observation and idscussion. (Bring in several types of weeds.) Questions 1. What is happening to the plants brought into the classroom? 2. Why do you think this is happening? 3. Would this observation hold true for all plants? 4. What can we do to prove this? 5. How does the appearance of this plant compare with grass palnts? 6. What is the difference between their root systems? 7. What is a tap-root system and of what advantage is it to the plant? 8. What are the advantages of the rosette pattern of leaf growth? 9. Given these characteristics, how is this plant well-suited for survival?	IA. Small spade.	IA. The student should observe, after discussion activity, that plants are wilting due to lack of moisture, lack of soil and movement out of environment. Student should generalize that a plant taken out of its environment will die. Student should, alsc, generalize that the plant structure is suited to its needs in its environment.

Grade Five Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Strategies and Activities	Materials	Evaluation
IB. Given a variety of possible alterations in plant's environment, the student will hypothesize the result of these changes and form a conclusion that plants need soil, water, sunlight to grow and survive.	10. Do all plants need the same or different environment? 11. How can we find out? IB. Two weeks prior to a discussion of the environment, plant a dozen flower seeds in healthy soil. When growth can be observed, separate the tiny plants as follows: -three to remain in the good soil as a control -three to receive insufficient water -three to receive no sunlight -three to be transplanted to sandy soil (deficient in minerals) Student should compare the growth and appearance of the four groups over a period of time, and draw conclusions, based upon their observations. Keep a record of the results. Questions: What conditions seemed to be most necessary for survival? How did the three test groups of plants react to their new environments?	IB, C, D. Seeds, fertilizer (or plant food), blotting paper, paper cups or mild cartons, dish of sand.	IB, C. D. E. Given a series of pictures of deficient plants, the student will state the cause of plant's present state and what corrections that can be made.

Grade Five Generalization: 1. Living things are interdependent with one another and with their environment.

Objectives	Strategies and Activities	Materials	Evaluation
	IC. Plant at least 10 seeds or seedlings in paper cups or small milk cartons which contain clean sand. Add different amounts of fertilizer or prepared plant food. Omit fertilizer entirely for 2 of the plants. Keep record of results.		
	ID. Place several bean seeds on some wet blotting paper in a dish and keep them moist. Observe change, if any. When soft, put half in soil and keep well watered. Give them plenty of sunlight. Leave the other half on blotting paper. As soon as they sprout ask: 1. Why does a green plant need soil? 2. What is in the soil? 3. Can a green plant live without soil? 4. How can we find out?		
	IE. Growth with Soil Make solution of plant fertilizer and distilled water. Using wire mesh, bend to simulate table to place in aquarium. Pour solution in aquarium to level just covering wire. Place moss on wire and seeds on moss. Observe for several days and record results.	IE. Aquarium or other similar container, wire mesh, plant fertilizer or plant food, spahgnum moss, distilled water, seeds.	

Grade Five Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
IF. After class activity of soil profile, the student will make and label a miniature soil profile.	IF. Teacher may want to do both of these activities. 1. Locat a road cut where soil sample is desired. 2. Make a verticle cut; 1 to 3 feet. 3. Note various layers and thickness of each. 4. Beginning at the bottom of cut, place in jar, pack well. 5. Do next layer and so on to the top.	IF. Large jar, spade, section of broom handle or similar object. Dig a hole on school grounds to extablish a soil profile.	IF. Given a diagram of a soil profile, the student will label each part. In general for activities #1A-C evaluation will be made through observation of class activity, discussion and discussion of recorded results.
IG. While making the soil profile, the students will also test the fertility of the different layers of soil labeled in the soil profiles.	IG. Put a sample of each layer in the baby food jars and label it. In each sample, plant identical seeds. Which layer does the seed grow the best in? Which layer doesn't the seed grow well in?	IG. Baby food jars, seeds, additional soil.	IG. Student responses to questions.
IH. Given a terrarium simulating a type of land environment, the student is to observe and record as many possible examples of interdependence as possible. (minimum 10)	IH. Set up terrariums simulating a woodland, bog, and desert environment. Have students observe and record as many examples of interdependence in the community as possible, being specific as to why one organism is dependent on another.	IH. Aquarium or similar container, water, dish or small pan, sand, soil, plants (depending on type of land environment), small animals.	IH. Record kept of observation. The student will chart how the environmen.s differ.

Grade Five Generalization: Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
I. I. The student, after constructing a progressing and moveable bulletin board, will design food chain and food webs showing man's dependency upon other organisms.	I. I. Having names and pictures of components, construct models of two or three simple food chains, and then convert them into a food web. Starting with soil, connect it to green plants by a length of cord between them. Next connect one of the herbivores to the plants; follow this with a carnivore linked to the herbivore. At first the components will depict simple food chains, but as more and more components are added, cross-links begin to be evident and the food web concept is easily developed. At the onset, it is advantageous to place soil and plants centrally, and then allow the remainder of the web to develop around them. Questions: 1. Why is soil necessary for all life? 2. What is the source of food used by animals? 3. In a natural environment, if all the members of a particular species, such as grasshoppers were removed from the food web, what would be the effect?	I. I. Prepare a set 6" X 12" cards lettered with such labels as soil, green plants, mouse, grasshopper, earthworm, snail, frog, shrew, robin, gartersnake, rabbit, owl, fox, goldfish, sparrowhawk, etc. Ball of string which can be cut to convenient lengths and used to connect the "links" in the bood chains and web.	I. I. The student will state how man depends upon other organisms through such examples as grass which feeds cow which gives us milk, cream, cheese, meat, etc.

Grade Five Generalization: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
	4. How would an increase of predators affect the food web? 5. As part of a food web, how does man differ from all other organisms?		I. I. 5. The student will state how man, as part of food web, differs from all other organisms. a. Man attempts consciously to manipulate the components which make up the web. b. Man has ability to understand the complex interdependencies. c. Man, therefore, has the obligation and responsibility to preserve the balance of the whole web.
IJ. After class discussion, the student will list food eaten the day before and place the foods under headings - plants and animals.	IJ. Have the students make lists of the foods they ate during the previous day. The list should be detailed and it should include every type of food product used. Direct the discussion so that man's dependency upon the environment will be demonstrated. Questions: a. What plants or plant products are included in the list? b. What animals provided the meat foods? c. What do these plants and animals need to survive? d. Are any of your food sources threatened by pollution? Look		IJ. The student will list in detail and include every type of food product used.

Grade Five Generalizaton: I. Living things are interdependent with one another and with their environment.

Objectives	Activities and Strategies	Materials	Evaluation
	on page 12. e. Are the sources of food for plants and animals themselves in any way threatened? f. If these food sources are in danger, what will happen to man? g. What can man do to protect his food supply?		
IK. The student; given names of 10 plants, animals and soil products; is to list all the uses man has for these products.	IK. To illustrate man's dependency upon animals, soil and plants, have students list all the uses we have for cotton cloth. Other plants or plant porducts might be substituted for cotton to expand or repeat the activity: 1. What benefits do we derive from cotton? 2. Are we dependent upon cotton for survival? 3. If our supply of cotton were threatened, what substitute could we make for the protection it affords us? If students lack background, teacher is to break them down into groups for research in the different plant or animal fiber used by man.		IK. Child to set up chart of plants and uses man makes of said plants. Do the same for animals.

Grade Five Generalization: II. Natural resources are our most precious possessions.

Objectives	Activities and Strategies	Materials	Evaluation
IIA. Given a list of objects that we use daily to make life easier, the student will trace back to its natural resource, and locate what regions or states produce the various natural resources.	IIA. Class broken down into small groups to study a map of natural resources of this area, resources found are to be listed.		
	IIA2. Students write letters requesting free materials on natural resources from each region of the United States.		IIA2. Letters using correct business letter form and correct language arts skills.
	IIA3. Given a worksheet with headings: Air, Water, Plants, Minerals, Soil - the student will list things that we use to make life easier. Bring back for class discussion and begin to compare and note the interrelationships.		IIA3. The student, given a list of objects, will state its natural resources.
	IIA4. Write a composition on "Our Most Valuable Resource."		IIA4. Composition using correct language arts skills (sentence structure, capitalization, punctuation, and spelling).
	IIA5. Student, given a natural resource, prepares a report on the resource and its importance to man. He also states what would happen if it suddenly disappeared.		IIA5. Report using correct language arts skills.
	IIA6. The students will take a resource and set up cards in each area that produces that resource.	IIA6. Action map & Kit #2: What It's Made of and How It's Used.	
	IIA7. Make a mobile of natural resources of a given area or state.	IIA7. Crayons or paint, cardboard, string, hangers.	IIA7. A mobile for each of various regions or states is created.

Grade Five Generalization: II. Natural resources are our most precious possessions.

Objectives	Activities and Strategies	Materials	Evaluation
IIB. Given the common mineral substitutes, the students will discuss their many uses and state which minerals they are substitutes for.	IIB1. Choose at least two of the following activities. Class to break up into committees to make a display of labeled specimens such as plastic, concrete, wood, glass, and fiberglass. IIB2. Report on some of the new, useful metals developed since 1945. IIB3. Report on sources of minerals. IIB4. Have a committee visit a local cement dealer to obtain information on the manufacture and distribution of cement. IIB5. Develop a chart showing major mineral resources man uses in the modern world. IIB6. Students, working in groups of two, will develop a list of words added to our language due to inventions and/or discoveries since 1900. Give the class 10 minutes to play this game, and the winners are those who have the most words.		IIB1, 2, 3. Students to display samples of minerals and their substitutes and models of their uses. IIB6. i.e. television, automobile, rocket, airplane, dishwashers, etc.

Grade Five Generalization: III. Soil is a natural resource.

Objectives	Activities and Strategies	Materials	Evaluation
IIIA. After discussion of why soil is a natural resource, the student will illustrate man's dependency upon soil.	IIIA1. Discuss why soil is a natural resource. IIIA2. Discuss increase in the human population and its effect upon what the soil produces. Why man makes the soil work harder for him? IIIA3. Write for a soil map os New York State and a soil survey report to observe how soils are distributed throughout the landscape. IIIA4. Make a population map of a given area to show that people tend to settle where there is good soil.		IIIA1. Class is to set up a bulletin board or mural to illustrate man's dependency on soil.

Grade Five Generalization: IV. Some parts of the natural environment are either difficult to replace, or are in fact irreplaceable.

Objectives	Activities and Strategies	Materials	Evaluation
IVA. Given a list of natural resources, the student is to explain the relationship between availability and economic importance or value.	IVA. Discuss and list how natural resources are wasted (may put in chart form). Bring out and develop the meaning of renewable and nonrenewable resources - set up charts and continue to add to it throughout the year as each region of the U.S. is studied.		IVA. The student is to write a brief report why mineral resources are considered nonrenewable.
IVB. As a result of this experiment, the student will develop a working definition of erosion.	IVB. Have the class construct a simulated example of water erosion taking place. Put the screen at one end of the pan. fill the pan with a layer of soil. Elevate the unscreened end of the pan. Pour water over the soil. Measure the amount of soil lost through the screened end. Try the experiment again, change the slope of the pan. Does this change the amount of soil lost?	IVB. A large, rectangular, metal or metal-lined pan, which is several inches deep, a screen, soil, water, measuring instruments.	IVB. Students' responses, i.e. "Erosion is the wearing away of soil by water."
IVC. Given the types of soil erosion, the student will state the combating erosion techniques in each case.	IVC1. Divide the class into groups to discuss the various types of erosions. They are to research methods of combating erosion, keeping in mind the following: The interrelationship of a. soil and plants b. soil and water c. soil and wildlife d. soil and man.		IVC1. The student will state types of erosion (gully, sleet, wind, streambank) and explain ways of combating erosion techniques (contour farming, strip cropping, grassed waterways, terracing, crop rotation, windbreak, cover crops, legumes, soil fertility, soil drainage).

Grade Five Generalization: IV. Some parts of the natural environment are either difficult to replace, or are in fact irreplaceable.
V. Man would do well to observe nature's example and recycle the results of his technology.

Objectives	Activities and Strategies	Materials	Evaluation
	IVC2. Collect run-off water and determine what it carries.		
	IVC3. Rewrite definition of erosion to include other types than water.		
VA. After class discussion, the students will develop a working definition of "recyclement".	VA. Lead a discussion of the meaning of recyclement. Ask students to bring to class articles, pictures, or models of things in our environment which can be and have been recycled. Some examples are: junked cars--scrap steel, used newspapers--clean newsprint, bottles--returned for reuse, cans--reprocessed tin and aluminum, trash--glass tubing, building tiles. Questions: 1. Why do both rich and poor societies nned to recycle the results of their technology? 2. What is "planned obsolescence"? 3. How can we encourage and take advantage of our "trade-in" practices (e.g. used cars for new ones, etc.) with retailers as a means of promoting one form of recyclement? (EEIA)		VA. The student will state a working definition of "recyclement".

Grade Five Generalization: VI. Man's efforts at changint the environment to fulfill his needs are often beneficial to hime but harmful to the environment.

Objectives	Activities and Strategies	Materials	Evaluation
VIA. Following these activities, make a value judgment on a controversial environmental issue.	VIA1. Set up a hypothetical situation such as the following: The electric company wants to build a facility on the only available land in a particular area. In order to secure this land, it must present its case for placing the plant in a wild-life section. The local conservationists oppose the project and will present their reasons for their opposition. Some students can write to the electric company and ask them how they select sites for plants and what benefits these plants bring to the community that outweigh the destruction of more of our natural environment. (EEIA)		VIA1. Students make value judgments.
	VIA2. The student will list the times they encounter the word pollution (visually or by ear for one week) in newspapers and magazines, on radio, TV, or posters displayed on buses. Record source and whether the word was used by a private citizen, a governmental agency, or a citizen's action group.		VIA2. Students' records.

Grade Five Generalization: VI. Man's efforts at changing the environment to fulfill his needs are often beneficial to him but harmful to the environment.

Objectives	Activities and Strategies	Materials	Evaluation
VIB. As a result of the activities in this unit, the class will present the play What Ever Happened to Mother Nature.	VIB. The class will present the play.	VIB. Play contained in appendix.	VIB. Play presented.

APPENDIX

PESTICIDES

WHAT ARE THEY?

They are poisons designed to kill pests. There are INSECTICIDES, to kill "bugs"; HERBICIDES, to kill"weeds"; FUNGICIDES, to kill molds and fungi; and RODENTICIDES, to kill rats. Originally they were meant only to reduce the pest populations.

WHAT DO THEY DO?

They kill pests. They kill creatures which eat the poisoned pests. They kill larger creatures which eat the creatures which have eaten the poisoned pests. They have been known to cause roofs to cave in!

Cause roofs to cave in? Well, not directly. But here is what actually happened on the island of Borneo. The islanders were in danger from malaria-carrying mosquitoes, so they sprayed with DDT. It killed the mosquitoes, bur not the roaches that were also on the island. The roaches simply absorbed the DDT into their systems.

In Borneo, gecko lizards are welcome in a house because they eat caterpillars and roaches, among other things. But when they ate these DDT-filled roaches, they became sick and sluggish. Then cats, which eat the lizards, got the DDT into their systems, and died. With the cats gone, rats moved in, and rats carry plague. More cats were brought in to control the rats.

That is when the thatched roofs of houses began to cave in. Caterpillars, which had been kept in check by the lizards, were eating away the roofs.

The thatched roofs of Borneo are a good example of an unexpected result of the use of a pesticide. The DDT used on Borneo, like many other pesticides, did not stay where it was supposed to. There is another problem with pesticides. Not only do they kill target pests, but they are also apt to kill helpful insects. What is more, some of the pests they are meant to kill, survive and breed a new generation that can "take it." Today there are more insect pest species than ever before. Over 200 kinds are no longer affected by pesticides. Costs of pest control have increased strikingly. On top of everything else, pesticides have polluted the biosphere (the thin outer layer of soil-water-air that supports life on Earth).

HOW SPRAYS DESTROY

DDT is the best-known example of a pesticide which has temporarily helped man while also causing great harm. It has destroyed mosquitoes carrying malaria and pests that eat our food grains. But, as some mosquitoes became resistant to DDT, more and more of it had to be used in order to control them.

That was probably the worst ecological blunder of our times. Hundreds of tons of DDT were sprayed from airplanes and ground sprayers as well. It reached the pests all right, but it also reached everything else. It drifted with the winds, sometimes for miles. It poisoned areas that had no need for it. It was absorbed by dust in the air and brought down by rain. The rain picked up additional DDT from the plants and the ground as it soaked

through the earth to sources of water. Winds, streams and ocean currents carried DDT to every square foot of the earth's surface.

Plankton and other living creatures took in the DDT and stored it in their bodies. When fish fed on these creatures, they also stored up DDT. Occasionally some died. Many were caught and eaten by animals and birds which depend on fosh for food. The poison was passed on to their predators, including man.

DDT last so long that it not only kills animals exposed to it, but even affects the lives of creatures not yet born. Here's how:

Many birds eat poisoned insects. Others, such as the eagle and the pelican, eat fish filled with DDT. Now one insect, or one fish, might not put enough poison in the bird's system to really matter. But think what happens when a bird eats hundreds of insects or severla fish each day. The DDT builds up in the bird's systems and before long reaches amounts that harms their natural functions.

Some birds, such as eagles and ospreys, begin to lay eggs with shells so soft that the embryo within is in danger of being crushed when the parent sits on the egg. The problem doesn't stop there. The developing embryo within the egg has DDT in its system passed on by the innocent parent. The yound bird is often hatched so weakened that it does not live. Or it may never develop fully inside the egg at all. If it does manage to hatch in a fair state of health, the food that the parent brings to it has a good chance of being poisoned.

Birds have been the most harmed so far. Because of their enormous appetite for insects they build up large amounts of poisons quickly.

Larger animals, having larger body systems, can absorb more poison before any bad effects are noticed. But signs are already beginning to appear that the danger point with them is not too far away. Even YOU, reading this, have DDT in your system. Remember, DDT is also absorbed by vegetables and plants that you eat.

TRY SAFER METHODS

Before you or anyone in your family picks up a spray can of insecticide, try a fly swatter instead. An "ounce of prevention" is always better than the "cure" when it comes to pesticides. Hold the number of pests down before they have a chance to start a population explosion. Use natural controls instead of pesticides.

Repair your worn-out screens. If you have grass, keep it cut and raked. Let the sunlight in. Don't give the insects a chance to hide and begin a family. A mixture of shrubbery and outdoor plants and trees is better than all of one kind. If you have one badly infested plant or bush, don't smother it with a pesticide. Try something else (see chart at right) or remove the plant.

Don't spray because you think there might be an invasion of insects in your garden. Homeowners often use more pesticides per square foot than farmers do, thinking that if a little does good, much more will be better. The homeowner who wants no insects, should have no garden because where there are plants, there are insects. Seldom in a home garden do the insects get out of control unless the gardener upsets the natural balance.

Remember, "pests" are not really a problem until they make trouble for man. As we said, the purpose of pesticides is to "check" pests, not entirely wipe them out.

Many of our so-called pests are actually helpful until they get out of hand. For example: Mosquitoes provide food for birds, fish and other creatures. Only when their numbers become too great are they a threat to man.

There is a simple answer to weeds, unless you have acres of them. Instead of rushing out and getting a herbicide, try a few "pleasant" hours just pulling them out by the roots. Someone once said that the best weed killer was the human hand.

The decision to use a pesticide should always be made by an expert. If one must be used, it should be one of the least dangerous.

When applying a pesticide, spot treatment should be used, not a "broadcast" in all directions. Not only you and your family could be harmed by these chemicals, but so could your neighbors or your pets.

WHAT NOT TO USE
(this partial list is subject to change)

Remember: If any of these chemicals are named on a package of pesticides your parents want to buy for your home or garden, urge them not to buy it! They all have a long life, do not dissolve or "wash away" and can remain in deadly concentration for many years.

INSECTICIDES: DDT, aldrin, dieldrin, chlordane, lindane, heptachlor, endrin, toxaphene, and resin strips (dichlorvos). HERBICIDES: 2-4-D, 2-4-5-T, or any compound containing lead, mercury, or arsenic. FUNGICIDES: dinitro cresol, captan, and folpet. RODENTICIDES: antu.

WHAT CAN BE USED
(if necessary)

Look for one (or any combination) of these "safer" pesticides: sulphur-lime mixtures, sulfur and sulfur-lime mixtures, pyrethrins, allethrin, rotenone (poison to fish), ryania, subidilla (poison to bees), silica aerogel, diatomaceous earth.

WARNING: Be sure to read the directions on the label and follow them carefully. Labels that contain the words "danger---poison," or "warning" are considered too dangerous for the homeowner to use.

WHAT EVER HAPPENED TO MOTHER NATURE?

AN ECOLOGY PLAY

BY CLAIRE BOIKO

Characters
MOTHER GOOSE
FROG
MOTHER NATURE
BO-PEEP
JACK
JILL
STAR CHILD
MARY CONTRARY
LITTLE MISS MUFFET
BOY BLUE
SPIDER
MAIDEN
MAN
WATER COMMISSIONER

BEFORE RISE: there is a large door down left. On it is a sign; DO NOT DISTURB. FROG squats beside door. MOTHER GOOSE enters right on a broomstick fitted out to look like a large goose.

MOTHER GOOSE: Here I come, just as I said I would. Once a century I visit Mother Nature down on Earth. Here I am. (She alights from broom and speaks to FROG). Ah, here's Mother Nature's page. Will you tell Mother Nature that Mother Goose has come calling, please?
FROG: Go away.
MOTHER GOOSE: What kind of welcome is that, pray tell?
FROG: It's all the welcome you'll get. Mother Nature is not to be disturbed. She's brooding. Go away.
MOTHER GOOSE: Stuff and nonsense. Mother Nature always has time for Mother Goose. Announce my presence this instant.
FROG: Very well, but you'll be sorry. (He hops off left.)
MOTHER GOOSE: What a rude frog. Dear Mother Nature, I remember her so well. Such a beautiful lady. So stylish. She never wore the same season twice. (Mother Nature enters down left, swathed in a gray duster. She wears a construction helmet, earmuffs, goggles and a surgical mask, and carries a canteen. She pokes her head through door, warily).

MOTHER NATURE: I'm not in.
MOTHER GOOSE: Is that you, Mother Nature?
MOTHER NATURE: (Taking down mask): Mother Goose? (She comes out through door). Oh, dear. Is it once-a-century again?
MOTHER GOOSE: What have you done to yourself? You've grown such great fuzzy ears. What is that bucket on your head? Why are you wearing a mask?
MOTHER NATURE: It's a long, sad tale, Mother Goose. I wear these horrid things to protect me. To protect me from--- them.
MOTHER GOOSE: Them? You mean the frogs? Your frog was very rude to me.
MOTHER NATURE: Don't be too hard, on poor froggie. He's having a hard time. You see, they polluted his lily pond, and now he lives from puddle to puddle. It's the dry season here, and he's very cross.
MOTHER GOOSE: Who is doing these dreadful things? Georgie Porgie? Tom, the Piper's son?
MOTHER NATURE: People. Ordinary people. Come with me. I'll take you to my favorite meadow. You won't believe what's been happening since you visited last century. (Curtain opens).

* * * *

SETTING: A deteriorated landscape. Backdrop shows factories belching smoke into a gray sky. There are crates and old boxes helter-skelter onstage. Down right is a silapidated wishing well with a sign: POLLUTED. NO DRINKING, WASHING OR WISHING. Down left is a pile of trash with a sign: DON'T PICK THE FLOWERS.
AT RISE: MOTHER GOOSE and MOTHER NATURE walk up center.
MOTHER GOOSE: (Dismayed): What in the wide world is this awful place? Where is your lovely meadow?
MOTHER NATURE: This is my meadow.
MOTHER GOOSE: But where are the flowers hiding? Why does the sky frown like that? Who slaughtered the trees? And where are the birds? I don't hear anything.
MOTHER NATURE: You will. (She adjusts earmuffs. There is a loud cacophony of auto horns. MOTHER GOOSE holds her ears).
MOTHER GOOSE: What a row! It's worse than the Kilkenny cats fighting.
MOTHER NATURE: Now you see why I must wear earmuffs and a mask. It's all very discouraging. Confidentially, if people don't stop using my world for their private wastebasket, I'm going to change my address.
MOTHER GOOSE: Mother Nature, you wouldn't.
MOTHER NATURE: Oh yes, I would. I'm already looking for another planet.
MOTHER GOOSE: Another planet! Why, Earth would become a ball of mud without you, Mother Nature. We must find a way to stop this. Perhaps my children can help. (She takes small hand-bell from pocket and rings it). Come one! Come all! From your lane and your little house. Come one! Come all! From Bo-Peep to Tom Tittlemouse. (Star Child, Jack, Jill, Bo-Peep, Mary Contrary, and Miss Muffet enter from left and right. They gather in a semi-circle around MOTHER GOOSE. Mother Nature sits on crate down left, observing them).

CHILDREN: All present and accounted for, Mother Goose.
MOTHER GOOSE: Look around you, children. What do you see?
STAR CHILD (Looking at backdrop through a telescope):
Star light, star bright,
Where are the stars I see at night?
I wish I may, I wish I might,
See through the smoke this murky night.
(Jack and Jill join hands, and cross to well, as others sit on boxes and crates).
JACK: Jack---
JILL: And Jill,
BOTH: Went up the hill,
To fetch a pail of water.
(They take bucket from well, and examine it).
JACK: They found a spring...(He holds up a coil).
JILL: And some slimy string...(She holds up greenish rope).
BOTH: But not a drop of water! (Auto horn sounds loudly. Boy Blue enters on tricycle, beeping bulb-type horn).
CHILDREN: (Putting hands on ears):
Little Boy Blue, don't blow your horn,
You'll wake all the neighbors this quiet horn,
BO-PEEP: (Yawning and rubbing her eyes):
I'm Little Bo-Peep,
I've lost my sleep,
Because of Little Boy Blue,
Please keep the noise down,
When you travel through town,
Or I'll lose my poor head, too!
(She holds her head. Boy Blue parks tricycle and joins others. Mary Contrary angrily crosses to dump, points at litter).
MARY: Shame, shame. Shame on somebody!
CHILDREN: Mary, Mary, quite contrary;
How does your garden grow?
MARY: You'd be contrary, too if somebody dumped junk on your jonquils and trash on your trillium. How koes my garden grow, indeed? (She holds up each item as she names it). With bottle caps, and litter scraps, and rusty cans all in a row. Humph! (She crosses back to seat, tossing her head. Miss Muffet crosses to her, waving spray can).
MISS MUFFET: I have something for your garden, Mary! (She pretends to spray can around stage). Insecticide! (Pulls up box and sits, still spraying).
CHILDREN: Little Miss Muffet, sat on a tuffet,
Using a garden spray...(Spider enters, staggering. He waves white flag of truce, then goes down on his knees).
SPIDER: Goodbye, cruel world. Little did Miss Muffet know---I was one of the good bugs. I caught flies and mosquitoes and all kinds of garden pests. Now it's too late. (He flops on floor, feet up. The children stand, hands on hearts. Jack and Boy Blue drag Spider offstage and return).
CHILDREN: Who did this to the world? Who?
MOTHER NATURE: People. Ordinary people. This is the world the people made.

CHILDREN: This is the world the people made.
What a woeful world the people made.
BO-PEEP: Look at the smoke that fouls the air.
CHILDREN: In the woeful world that people made.
JACK: Look at the slime that spoils the water.
BO-PEEP: Look at the smoke that fouls the air,
CHILDREN: In the woeful world that people made.
JILL: Look at the dump that clutters the land.
JACK: Look at the slime that spoils the water,
BO-PEEP: Look at the smoke that fouls the air,
CHILDREN: In the woeful world that people made. (MAIDEN and MAN enter).
MAIDEN (Coughing): I am the maiden all forlorn,
Who coughs and chokes with the smoke each morn,
But I'll write to my Congressman, sure as you're born.
(She waves stamped letter).
CHILDREN: To clean up the world the people made.
MOTHER NATURE: (Taking off her mask): I'm tired of the litter all tattered and torn,
MAN (Holding out newspaper): And I'll help the maiden all forlorn,
I'll put trash in the basket, that's what I've sworn,
CHILDREN: To clean up the world the people made. (MOTHER NATURE removes goggles.
WATER COMMISSIONER enters).
COMMISSIONER: I'm the Water Commissioner, shaven and shorn,
Phosphates and foam deserve my scorn,
I'll clean up that water this very morn.
(He turns sign on will around. It now reads: 100% PURE.
MOTHER NATURE takes off canteen and helmet).
CHILDREN: To clean up the world the people made (FROG hops in and squats next
to well. He carries a little banner that says: PURE WATER SAVES FROGS.
BOY BLUE, on trucycle, with a muffler on hern, crosses center).
BOY BLUE: I'm the boy who clamored each morn,
But I've put a muffler on my horn.
(MOTHER NATURE takes off her earmuffs).
CHILDREN: To quiet the world the people made. (MOTHER NATURE removes duster,
revealing green gown with chain of daisies. BO-PEEP crowns her with daisies).
MOTHER GOOSE: Why, Mother Nature, you are your old self again.
MOTHER NATURE: I never thought I'd wear Spring again. Thank you, Mother Goose.
CHILDREN (Standing):
People can undo, what people have done.
Turn off the smokestacks; turn on the sun.
Clean up the lilyponds; green-up the grass,
Hush up the hubub where traffic must pass.
Then we'll sing as we wander through meadow and glade...
MOTHER NATURE: What a wonderful world the people have made!
ALL (As curtains close): What a wonderful world the people have made! (Curtain)

THE END

5th and 6th Grades

Filmstrips:

A. Society for Visual Education, 1345 Diversey Parkway, Chicago, Illinois 60614
   1. "America the Beautiful"
   2. "Let's Explore a Field"
   3. "Let's Explore a Lawn"
   4. "Lets Explore a Stream"

B. McGraw-Hill Text Films, 330 W. 42nd Street, New York, New York 10018
   1. "Animal Homes"

C. Curriculum Films, Inc., 1319 Vine Street, Philadelphia, Pennsylvania 19104
   1. "Conserving Our Resources"

D. Jam-Handy, 2821 E. Grand Blvd., Detroit, Michigan 48211

Magazines:

1. Audubon

2. Ranger Rick

3. Scientific American

10. Hogner, Dorothy Child, Conservation In America, New York, Lippincott Co., 1958.

11. Reid, George K., Pond Life, New York, A Golden Nature Guide, 1967.

12. Reynolds, Christopher, The Pond on My Windowsill, New York, Pantheon Books, 1969.

13. Shuttlesworth, Dorothy E., Clean Air - Sparkling Water, Garden City, New York, Doubleday & Co., 1968.

14. Time-Life editors, Life Nature Library, New York, Time-Life Publishers, 1967 (Note children's bibliography)

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Bibliography for Teachers

Guides:

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2. Guide to Environmental Education: Conservation of Natural Resources, K - 6, Department of Curriculum Development, The Madison Public Schools, Madison, Wisconsin, 1970.

3. Man in His Environment: A Unit on Conservation for Grade Six, T. Tana Herchold, San Diego City Schools, San Diego, California, 1969.

4. People and Their Environment - Grades 4-5-6, ed. Matthew J. Brennan, J. G. Ferguson Publishing, Co., Chicago, Illinois. (Teachers' Curriculum Guide to Conservation Education)

Texts:

1. Batton, Louis J., The Unclean Sky, Anchor Books, New York, 1966.

2. Blough, Glenn O. and Schwartz, Julius; Elementary School Science and How to Teach It; Holt, Rinehart and Winston; New York, 1964.

3. Briggs, Peter, Water: The Vital Essense, Harper and Row, New York, 1967.

4. Brown, Gertrude Stephens, Your Country and Mine, Boston, Ginn and Co., 1963.

5. Carson, Rachel, The Sea Around Us, Golden Press, New York, 1958.

6. Drummond, Harold D. and Loan, Fred A., Jr., Journeys Through The Americas, New York, Allan and Bacon, 1960.

7. Emanuelson, Clifford E. and Virginia, Conservation Quickies: Conservation Teaching Aids, Illinois, Dunville Press, 1966.

8. Graham, Ada and Frank, Jr.; Wildlife Rescue: Alternative to Extinction, New York, Cowles Book Co., Inc., 1970.

9. Hilton, Suzan, How Do They Get Rid of It?, Philadelphia, The Westminster Press, 1970.

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(Address previously given in this guide - initials of name of publishers)

Pamphlets

1. "Bird Houses and Feeders", National Audubon Society, 1130 Fifth Ave., New York, New York 10028

2. "Forest and Wildlife", (USFS)

3. "Forest Insects and Diseases", (USFS)

4. "Growth of a Tree", American Forest Institute, 1835 K. Street, (AFPI), N.W., Washington, D. C. 20006

5. "Its a Tree Country", (AFPI)

6. "Natural Water Cycle", (USFS)

7. "Products of American Forests", (USFS)

8. "Teaching Soil and Water Conservation: Classroom and Field Guide", Soil Conservation Service, Box #11222, Fort Worth, Texas 76110

9. "Watersheds", (USFS)

5th and 6th Grades

Films

1. The Nation's Grasslands - United States Department of Agriculture Forest Service (USFS), South Guilding - 12th Street and Independence Ave., S. W. Washington, D. C. 20250

2. Nature's Half Acre, color, 33 min. - Walt Disney Productions, Educational Film Division, 350 S. Buena Vista Ave., Burbank, California, 91503

3. Vanishing Birds, color, 11 min. - Picture Films Corporation, 29 E. 10th Street, New York, New York 10003

4. Patterns of the Wild, color, 27 min. (USFS)

5. From the Ridge to the River, color, 26 min., United States Department of Agriculture, Motion Picture Service, Washington, D. C. 20250

6. The Restless Sea, color, 60 min. - Bell Southern Telephone and Telegraph, 195 Broadway, New York, New York 10007

7. Mountain Water, color, 17 min. (USFS)

8. Our Mr. Sun - 2 parts - color, 60 min., Bell Telephone Co., local address.

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33. Peterson, Ottis, Jr. Science Book of Water Garrard Publishing Co., 1966.

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36. Schloat, G. Warren, Jr., The Magic of Water, New York, Charles Scribner's Sons, 1955.

37. Selsam, Millicent, See Through the Lake, New York, Harper & Row, 1958

38. Selsam, M., Underwater Zoos, New Yor, William Morrow and Co., 1961.

39. Shuttlesworth, Dorothy E., Clean Air - Sparkling Water, New York, Doubleday & Co., 1968.

40. Smith. F. C., The First Book of Conservation, New York, Franklin Watts, Inc., 1954.

41. Smith, F. C. The First Book of Water, 1959

42. Urell, Catherine and Nonnenmacher, Rosamunda, The Big City Book of Conservation, New York, Follett Publishing Co., 1956.

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Elementary Grades 1 - 5

Sources Used:

*Most Helpful

*1. Environmental Awareness (Set of five filmstrips and sound tapes), Centron Educational Films.

2. Interdependence of Living Things - Animal and Plant Communities: Pond, McGraw-Hill Book Co.

*3. Environmental Education Instructional Activities, The University of the State of New York, The State Education Department, Albany, N.Y. 12224.

*4. People and Their Environment, (Teachers' Curriculum Guide to Conservation Education), Grades 4, 5, 6, J. G. Ferguson Publishing Co., Chicago, Illinois, (Edited by Matthew J. Brennan).

*5. Instructors' Magazine.

*6. Grade Teachers' Magazine.

*7. Previously Developed Environmental Units.

*8. Man A Course of Study, developed by Education Development Center, Inc. under grants from the National Science Foundation.

*9. Investigations in Ecology (Looking into Earth's Life Systems and Man's Impact on Environment), Beth Shultz and Phyllis Marcuccio, Bell and Howell Company, Charles E. Merrill Publishing Co., Columbus, Ohio 43216

Teacher's Resources

American Insurance Association, 110 Williams St., New York 10038

American Petroleum Institute, 1271 Avenue of the Americas, New York 10020 (Inquire about four-piece kit, Conserving Our Waters and Clearing the Air)

Bureau of Reclamation, U.S. Department of the Interior, 19th and C Streets, N.W., Washington, D. C. 20240

Corps of Engineers, P.O. Box 80, Vicksburg, Miss. 39180 (ask for "Flood Control in the Lower Mississippi River Valley")

Department of Air Pollution, 9722 W. Watertown Plank Rd., Milwaukee, Wis. 53226

Federal Water Pollution Control Administration, U.S. Department of Interior, Washington, D.C. 20240

Humble Oil and Refining Company, P.O. Box 2180, Houston, Tex. 77001

League of Women Voters of the United States, 1200 17th St., N.W. Washington, D. C. 20039

Life Education Program, Box 834, Radio City Station, New York 10019 (Reprint No. 69--Air Pollution; minimum order 10)

National Plant Food Institute, 1700 k Street, N.W., Washington, D. C. 20006

Shell Oil Company, 50 W. 50th St., New York 10720

Superintendent of Documents, U.S. Goverment Printing Office, Washington, D. C. 20402; also source of reprints of Congressional Record containing your congressmen's statements on air and water pollution.

Time (Weekly News Magazine), April 11, 1969; Time-Life Building, Chicago, Ill. 60611

United Newspaper Magazine Corporation, 485 Lexington Ave., New York 10017 (See issues of This Week for April 6 and 20, 1969)

U.S. Department of Agriculture, Forest Service, 14th Street and Independence Ave., S.W., Washington, D.C. 20205

U.S. Water Resources Council, 1025 Vermont Ave., N.W., Washington, D.C. 20005